

# BEAUMARIS LAKE OPEN SPACE

Preliminary Design Report

December 2018





# Executive Summary

The open spaces and amenities surrounding Beaumaris Lake are starting to show their age. Opened in 1979, these adjacent areas are almost 40 years old and need to be updated to deal with a host of safety and visual issues. Stantec has been engaged with the City of Edmonton through a number of phases for Beaumaris Lake; in 2016 Stantec completed the Beaumaris Lake Condition Assessment and Rehabilitation Plan, and in 2017 provided a Functional Program Assessment and Summary and completed Concept Design for the Open Space Rehabilitation.

Stantec was engaged again in 2018 to work with the City as the consultant team to advance the project through preliminary design. The preliminary design focused on refining the design for the six main project scope areas:

- West Park
- Promenade
- East Park
- Viewpoints
- Trails
- Lighting

The consultant team worked with the City project team and consulted with EPCOR, Edmonton Police Service, and numerous City departments, including Forestry, City Operations, and Open Space Asset Management. The results of these consultations assisted the team in providing solutions to make the project successful. The team also engaged with the public in order to communicate the preferred concept options and solicit feedback on materials preferences for furnishings, lighting, and surfacing.

This report provides a high-level overview of the five project areas, and goes into detail on the review and investigation that was completed to refine the designs and provide reasonable confidence on the feasibility of the design development. This report also provides a Class 'C' cost estimate (-15% to +30%) and a 'Next Steps' guide for the continuation of the project.



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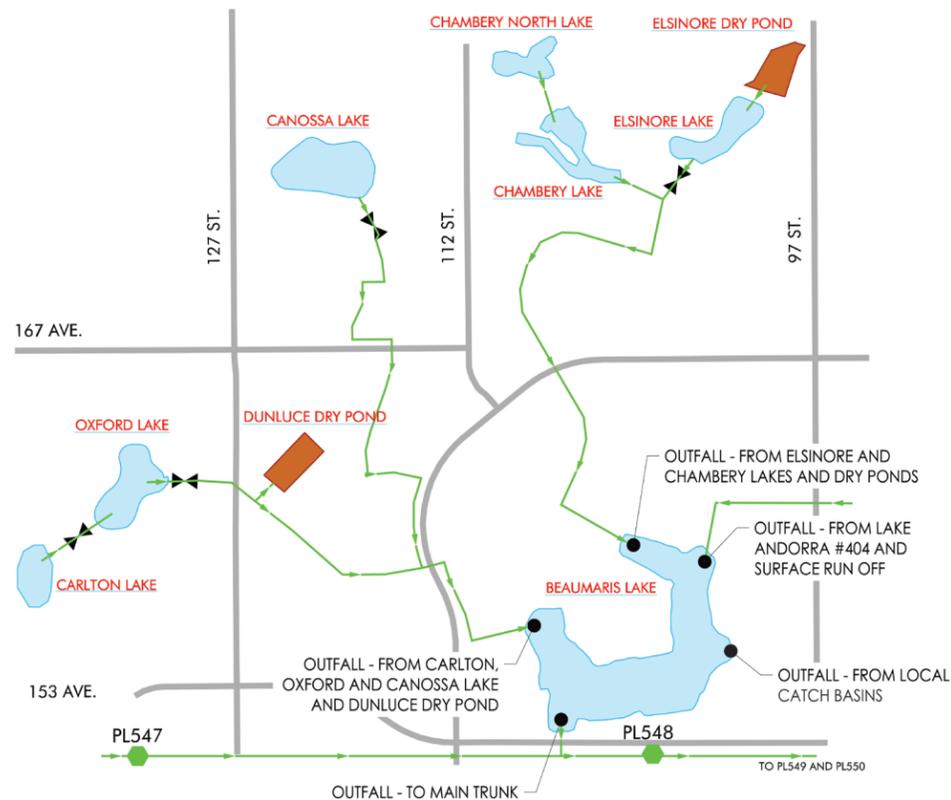
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# Project Introduction

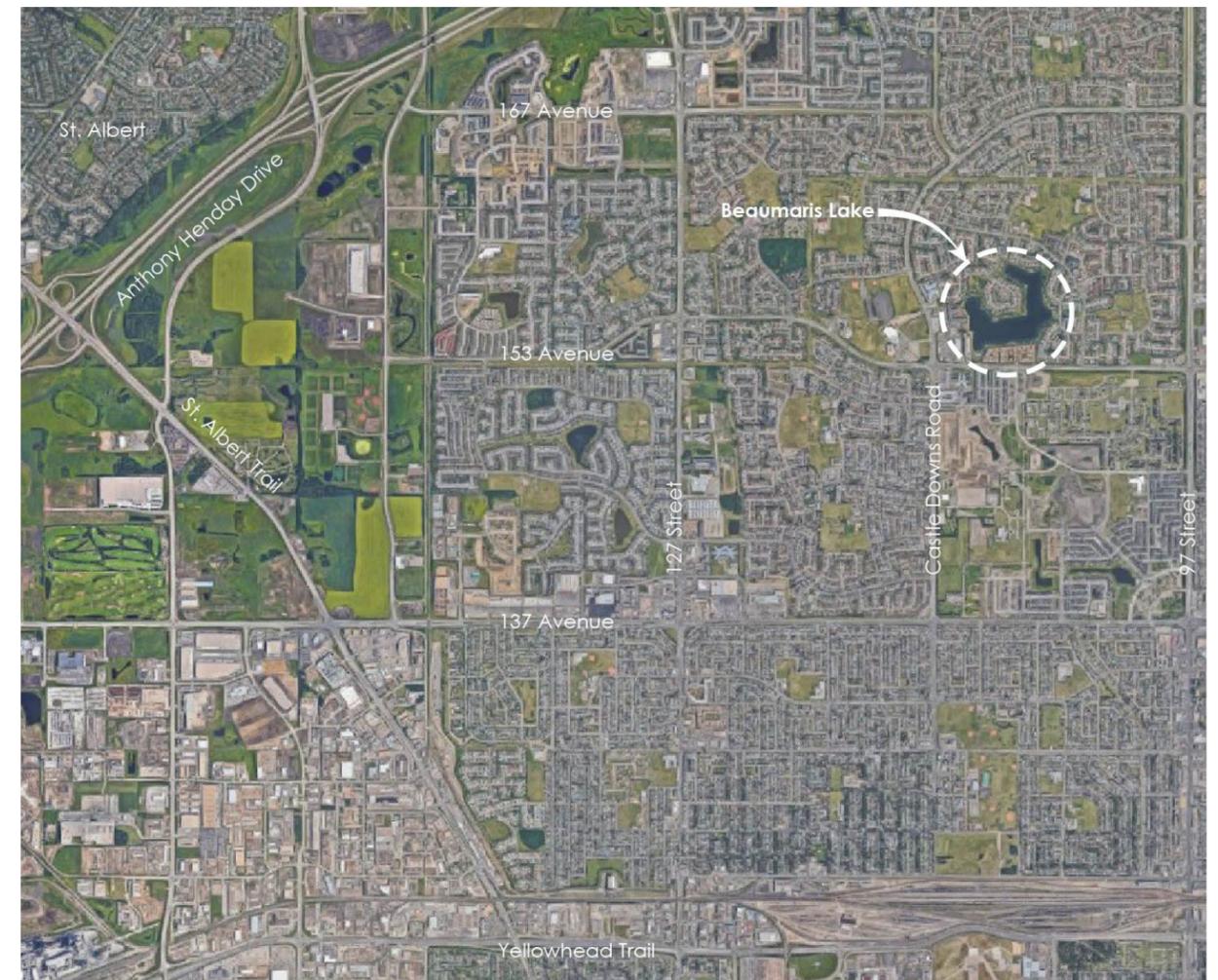
## Lake History

Located in north Edmonton, Beaumaris Lake is the oldest and largest storm water lake in the City. Opened in 1979, Beaumaris Lake is a well-loved destination for residents and visitors, displaying a panorama of marsh plant life, mature trees, birds, and wildlife. With approximately 2.5km of trails around the lake, it is a popular location for running, walking, cycling, and other methods of active transportation. The lake also serves a functional purpose, playing a key role in a much larger drainage network spread across northwest Edmonton (refer to Storm Water Network graphic, this page). Beaumaris Lake serves as the final collection point for surface water runoff from a series of stormwater lakes stretching from 135 Street to 97 Street and from Anthony Henday Drive to 153 Avenue.



Beaumaris Lake Storm Water Network

Due to its age and success as a community amenity, the open space is experiencing deterioration, causing aesthetic and safety issues. In 2016, the City of Edmonton completed a conditions assessment of Beaumaris Lake, which included the surrounding landscape, amenities and open space, and the lake itself. The lake was determined to be functioning well in terms of flood protection and water quality enhancement, however, the assessment identified a need for rehabilitation of the surrounding public realm.



Beaumaris Lake Location Map

## Project History

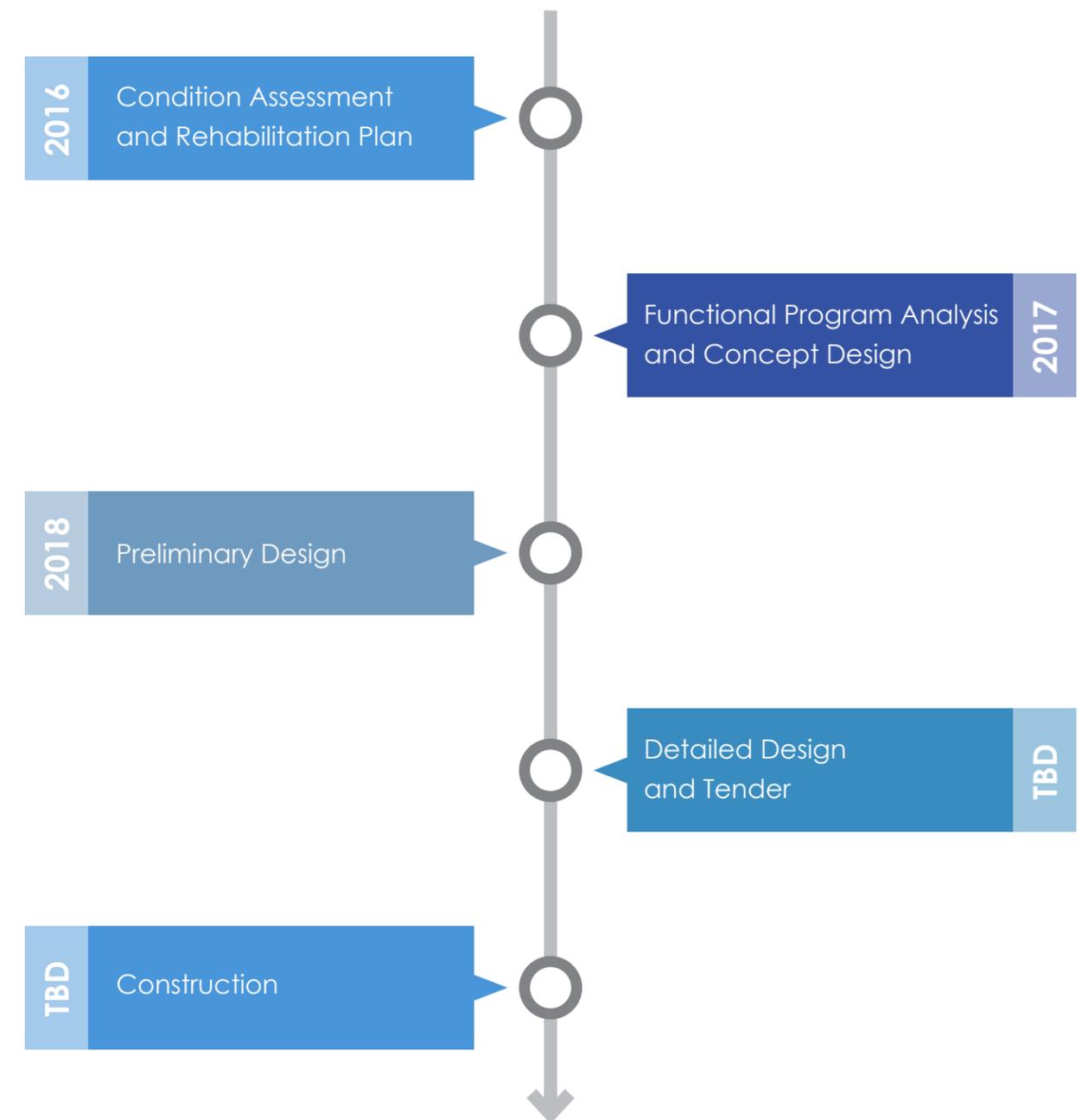
### 2016 - Beaumaris Lake Conditions Assessment and Rehabilitation Plan

This project identified the need to rehabilitate the public realm surrounding the lake. This report references data from the Conditions Assessment report, and the full report can be found in Appendix A.

### 2017 - Beaumaris Lake Open Space Rehabilitation Functional Program Assessment and Concept Design

Using the recommendations from the Conditions Assessment, the Functional Program Assessment and Concept Design further identified the areas of interest and provided concept design for these areas, including a Class 'D' cost estimate. This was used to create a request for a Capital Budget Profile for 2019-2022. The full Concept Design Report is available for viewing on the City of Edmonton project website.

## Project Timeline

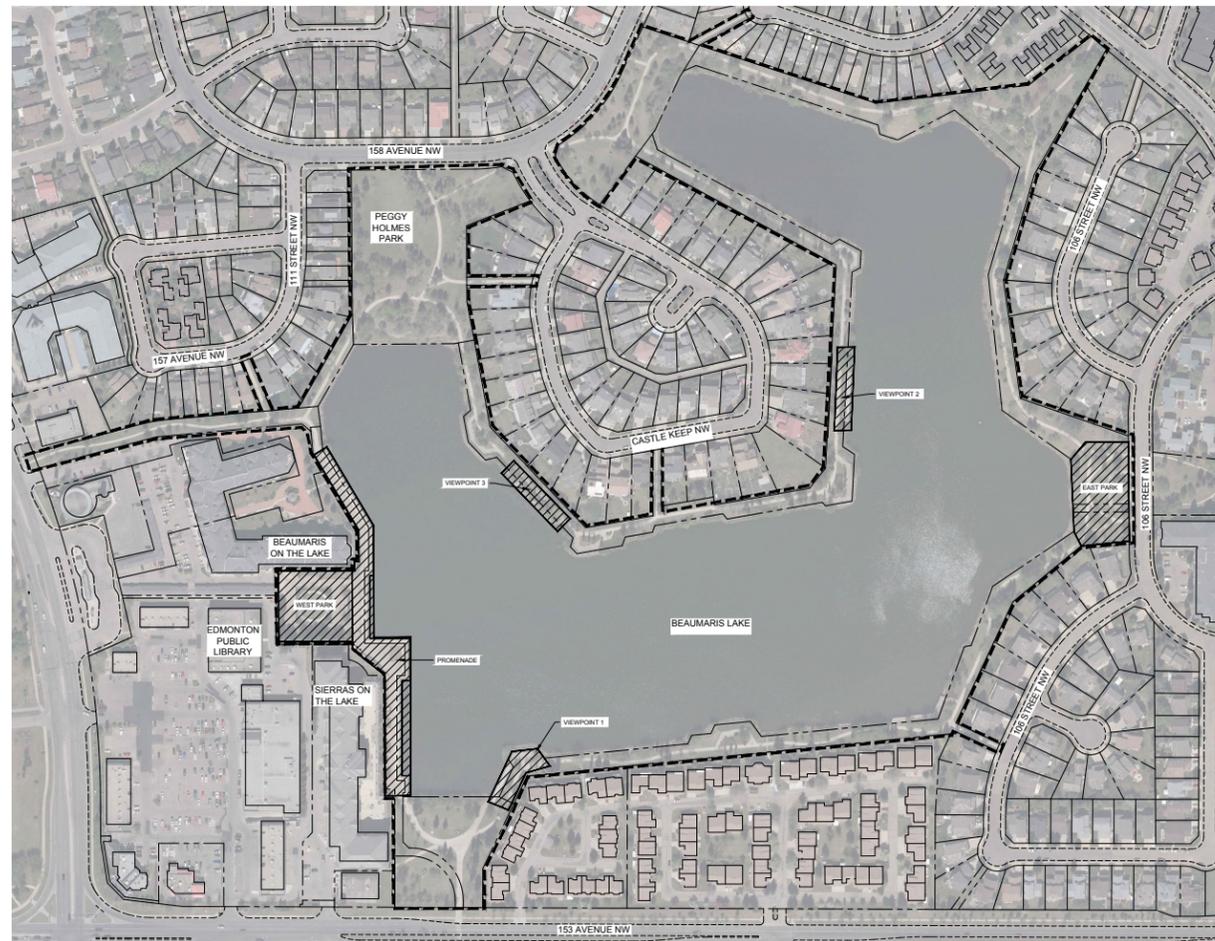


# Project Area Overview

As noted in the Executive Summary, and identified in the previous Concept Design Report, the project consists of six main project scope areas:

- West Park
- Promenade
- East Park
- Viewpoints
- Trails
- Lighting

The following sections provide a high-level overview of the existing conditions and challenges for each scope area, as outlined in the Concept Design Report.



Project Scope Areas

## Project Vision, Values, and Objectives

### Vision Statement:

*"To provide a high quality, natural environment that supports healthy living by offering opportunities for: tranquility and rest, wildlife and stormwater management education, community gathering, and physical activity."*

### Project Values:

- Preservation and enhancement of mature landscape and theme
- Peacefulness and tranquility
- Safety and security
- Community gathering
- Education, wildlife preservation, and connecting children to nature
- Exercise and physical activity

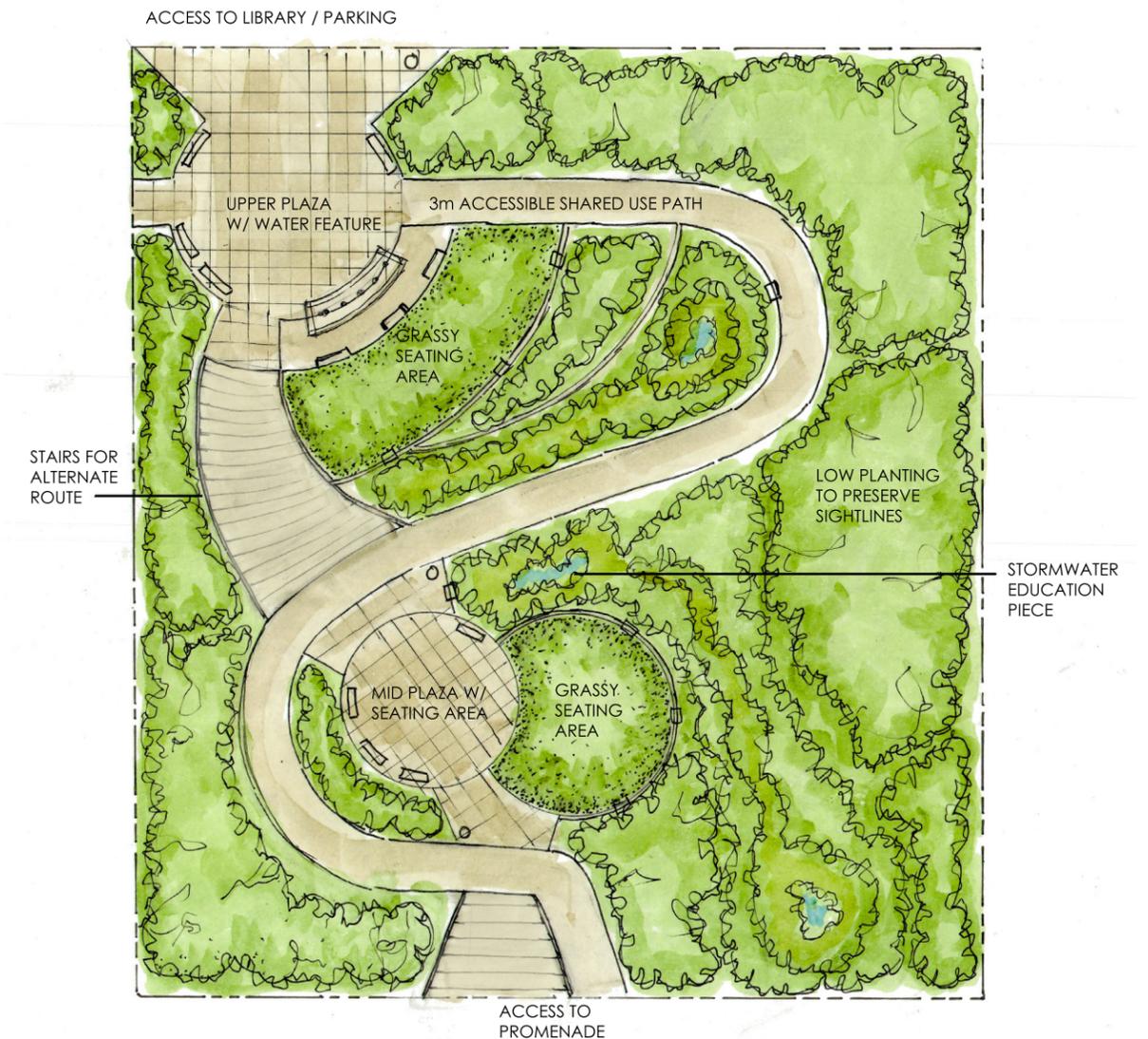
### Project Objectives:

- Improve user experience at the lake
- Improve views of the lake
- Retain and enhance existing landscape
- Improve trails and seating network
- Provide connections between the lake and the library
- Create gathering places
- Provide education on rain garden and innovative stormwater management
- Provide support signage for exercise loop

## West Park

The West Park is the major access point from the library and commercial businesses adjacent to the lake down to the promenade and lake trails. The conditions assessment identified the West Park as an area requiring short term attention. Currently, the stairs are almost completely barricaded due to deterioration, resulting in poor accessibility. There are also no existing ramps in the West Park, forcing those with mobility challenges to access the promenade and trails from other locations. Due to age and construction practices at the time of installation, the paving stones should be replaced to address settlement issues, and for modernization. Along with the disrepair of the West Park, it was heard that the large expanse of hard surface contrasts with the rest of the open space. The visitors and residents highly value the natural feel of the lake, and expressed the desire to have the West Park reflect this.

The final design includes a gentle, winding path to provide universal accessibility, as well as a wide staircase for a direct route to the promenade. Space is identified in the upper plaza for an interactive art or water feature, and several seating and resting areas are available in the upper, mid, and lower plazas. The upper and mid plazas both have adjacent open lawn areas, and interpretive rain gardens are included to showcase the importance of natural stormwater management.



West Park Preferred Concept Plan

## Promenade

Along with the West Park, the Promenade serves as a key gathering hub for the Beaumaris Lake trails. While the conditions assessment identifies only the replacement of the guardrail as a short-term priority, functionality of the Promenade is closely tied to the West Park. The pavers and planter walls are showing deterioration and differential settlement, and the current concrete barricade obstructs the views to the lake. Furnishings in the Promenade appear to have been replaced recently, and are generally in good condition.

The design for the Promenade looks to balance the users in the Promenade area. A vegetated edge is added to the face of the Promenade wall, creating a softer edge around the lake front. The solid, concrete barrier will be removed, and replaced with a decorative railing to match the rest of the lake, and allow views through. The paving materials represent a separation between the various users on the Promenade. The boardwalk pavers represent the traditional use of wood decking along a waterfront promenade and the slow movement of people walking and resting. The concrete surface signals a faster movement area that can be used for cyclists. Due to the high volume of people using the promenade, signage could be used to differentiate between the areas to avoid conflict.



## East Park

The East Park at Beaumaris Lake provides access from the Beaumaris neighbourhood, and has incredible views looking west over the lake. As the amenities and landscape in the East Park are in relatively good condition (albeit outdated), the East Park was not reviewed in the conditions assessment. However, during the functional assessment, it was identified as a desired location for improvement due to the perceived safety and security issues, prompting the City project team to add the redevelopment of the East Park to the scope of the project. The dense vegetation close to the road impedes the views into the park, making it a desirable location for illicit activities.

The community was interested in discouraging gathering close to the road, concentrating it on the lower level, adjacent to the shared use path. Views from the road will remain unobstructed, and site lighting has been design to increase visibility into the park.



East Park Preferred Concept Plan

## Viewpoints

There are a number of viewpoints and floating docks around the trails at Beaumaris Lake. The viewpoint platforms are constructed of timber and are in fair condition. The railings are a combination of aluminum and wood, and are also in fair condition.

The lake trails currently include three floating docks and one raised viewpoint. Two of three floating docks are fenced off, prohibiting the public from accessing them. The raised viewpoint is accessible, and consists of an aluminum and wood railing. The viewpoint is supported by concrete piles. The docks are a well-loved feature of the lake, however direct contact with stormwater lakes is prohibited under Edmonton's Drainage Bylaw 16200 and the docks must be removed.

Due to the popularity of the floating docks, the trade-off for removing them is to propose new raised viewpoints in their place. See the Structural Engineering section for further information on the design for the raised viewpoints.

## Trails

The trails around Beaumaris Lake demonstrate the variation of upgrades that have happened over the years. Most of the trails are concrete construction, and many have been widened to fulfill the role of a shared use path. Due to grading issues and sump pump drainage from adjacent properties, there is evidence of water ponding at various locations around the lake, which results in areas of ice in the winter, and wet, muddy trails the rest of the year. As part of the open space rehabilitation, the trails should be removed and reconstructed as 3.0m wide asphalt shared use paths, with grading issues rectified to allow positive drainage and mitigate water ponding.

Furnishings around the trails also vary in their style and age, indicating replacements that have happened over the years as needed. A few memorial benches existing around the lake. Through the concept and preliminary design stages, the consulting team and the City project team have identified areas where the furnishings should be removed and replaced with new furnishings (West Park, Promenade, East Park, and new Viewpoints). All other impacted furnishings will be removed, stored, and reinstalled. The placement of the impacted memorial benches will be coordinated with the families prior to re-installation.

## Lighting

Pedestrian lighting exists throughout the trails and amenity areas of Beaumaris Lake. Light fixtures appear to be in fair condition, however overgrown vegetation impacts the lighting distribution in some areas. Power infrastructure is showing presence of rust and metal fatigue. In order to address perceived safety and security concerns, the lighting has been redesigned to include LED light fixtures and revised light spacing. See the Electrical Engineering section for further information on the lighting design and considerations.

# Preliminary Design Scope

The scope of preliminary design for Beaumaris Lake Open Space Rehabilitation was to finalize the concept designs, engage with the community, and prepare preliminary design drawings and this preliminary design report. A number of services were provided during preliminary design, including landscape architecture, public engagement, civil engineering, electrical engineering, structural engineering, geotechnical investigation, and topographic survey.

The consultant and City project teams engaged with the public to present the final concept design options and solicit feedback on furnishing and surface materials. The public engagement also included a Dusk Walk where representatives from the City, Edmonton Police Service, and EPS Neighbourhood Empowerment Team were present.

Throughout the concept and preliminary design the residents have clearly identified the safety concerns caused by vegetation around the lake blocking sightlines in and out of the park spaces, as well as on the trails. The designs for the West Park and East Park, as well as the raised Viewpoints, result in the removal of a number of large trees and existing vegetation. Extensive plant material will be replaced in the West and East Parks, however, the majority of it will be low shrubs, perennials, and grasses to promote clear sightlines into the sites. New tree planting is proposed along the Promenade. City of Edmonton Urban Forestry staff reviewed the site and assessed the plant material to be removed. The costs of the value of the trees, their removal, and the protection of adjacent trees has been added to the cost of the project.

Preliminary geotechnical investigations of the project areas have concluded that the ground is suitable for the proposed improvements. Preliminary structural engineering investigations and designs have been done for the raised Viewpoints and the cantilevered planter on the Promenade. Due to the age and uncertainty of the Promenade construction, the City will be performing additional structural assessment on the supported structural slab to inform detailed design. A visual assessment was also completed on the south retaining wall in the West Park, noting that the wall is out of plumb. The replacement of this wall was added to the scope of the project.

Electrical engineering reviewed the existing light fixtures and infrastructure, and provided recommendations for upgraded fixtures, including spacing. During preliminary design it was identified that the lighting in Beaumaris Lake Open Space would require a transfer of assets from EPCOR to the City of Edmonton. This infrastructure was also incorporated into the design.

The water feature in the West Park was also reviewed in preliminary design. The consultant team worked with the City and EPCOR to develop and discuss the feasibility of various options and opportunities.

This preliminary design reports presents the specific design considerations addressed during preliminary design and summarizes the findings and recommendations for the project.

# Public Engagement

## Open House and Online Survey

The final public engagement event in concept design presented multiple options and received feedback on the options. The scope for preliminary design public engagement consisted of communicating the preferred concept design options based on the feedback from concept design and soliciting comments on specific design items such as furnishings, lighting, and surface materials. Stantec and the City hosted an event on June 13, 2018, which consisted of an open house and a community dusk walk. The open house event was supplemented with an online survey that was live from June 13 - June 30, 2018. The questions on the survey were the same questions asked at the open house.

The open house event was drop-in style with no formal presentation. The project team set up presentation boards, and representatives from Stantec and the City were present to escort attendees through the boards and discuss the changes that were incorporated from the previous engagement session. Attendees were also invited to provide feedback on the styles and materials for furnishings, lighting, and surface materials. The following is a brief description of the results:

### **Furnishings**

Attendees and survey respondents were asked for feedback on the material type for furnishings (concrete, metal, or wood), and their preference on bench backs and arms. The results showed the majority of respondents preferred wood furnishings, benches with backs, and a combination of arms and no arms.

### **Lighting**

Attendees and survey respondents were asked for feedback on the lighting style for pole lighting and bollard lighting (heritage or contemporary style). The results showed a preference for heritage style.

### **Surface Materials**

Attendees and survey respondents were asked for feedback on the type of surfacing materials for the Promenade boardwalk area (wood textured concrete pavers, wood composite, or real wood) and the additional walkway / plaza areas (concrete, stamped concrete, or paving stones). The results between the online survey and the public open house varied for both these areas; for the Promenade wood textured concrete paver were preferred at the open house and wood composite was preferred on the survey, and for the walkway / plaza areas, concrete was preferred at the open house and stamped concrete was preferred on the survey. The consultant team noted that there were many questions on wood textured pavers and stamped concrete at the open house, and, once the public was clear on what these options were, many chose them as their preferred material. The online survey did not allow for this interaction, thus could be the reason why the material preference varied. Ultimately, the preferred surfacing material was wood textured concrete pavers for the Promenade, and stamped concrete for the walkway / plaza areas.

This feedback was taken into consideration when choosing these materials in preliminary design. In addition to the public event, an online survey was also made available. The survey was formatted to those who were unable to attend the event and included the same questions that were asked at the event, as well as allowed for open ended responses.

## Dusk Walk

Members from the community were invited to tour the lake with representatives from the consultant team, City project team, and other professionals responsible for the safety, maintenance, and preservation of Beaumaris Lake Open Space. The attendees included representatives from Edmonton Police Service (EPS), the EPS Neighbourhood Empowerment Team (NET), the City of Edmonton's forestry and parks operations departments, and Ward Councillor Jon Dziadyk. Some of the input received during the dusk walk included identifications of specific areas requiring maintenance, areas with low or inadequate lighting, popular gathering spaces / problem areas, and conflict points for pedestrians and cyclists. These items were noted by the representatives in attendance, and many, such as undergrowth and overgrowth maintenance and public safety concerns, can be prioritized outside of the scope of the project by the City and EPS.

The full "What We Heard" report can be viewed in Appendix B.



## Edmonton Police Service Response

The dusk walk was attended by Constable Chris Moore from the EPS division in which Beaumaris Lake is situated. During the concept phase, the community voiced numerous concerns regarding the ability for illicit behavior to take place, due to poor sight lines and lighting in the park, and many residents felt unsafe using the space in the evenings or early mornings. The Constable in attendance expressed surprise at this feedback, as the number of calls for the open space have not indicated any special attention is needed. This, he noted, could be because residents feel it's not worth calling, as 'nothing can be done', or it could be a general feeling of uneasiness, and not always based on incidents or situations. In response to the dusk walk and conversation with the community members, EPS members reviewed the conditions and the concept design report and provided some additional material on CPTED (Crime Prevention Through Environmental Design) that they use when teaching CPTED training. The full CPTED material provided from EPS can be viewed in Appendix C. The following topics outlined in the CPTED material are relevant to the project.

### Lighting

Lighting considerations for CPTED include hierarchy of lighting types and intensities, placement of lighting, consistency of lighting, and inappropriate lighting. The existing lighting is consistently spaced, however, due to the era of the lighting installation and the overgrowth of plant material, the lights are insufficient in providing sharp, unobstructed distribution. During preliminary design a new LED light was identified that could replace the existing fixtures. The preliminary spacing is based on the recommended distribution for pedestrian areas, however final light placement will need to be determined in detailed design. Placement in detailed design should consider existing plant material to ensure there are no obstructions to lighting distribution.

### Access to Assistance

While the lake trail has numerous egress points the locations of these points are not always visible while on the trail. Wayfinding signage posted around the lake can help users orient themselves with the trail and the connections to the community. The area around the lake is well populated with commercial and residential uses, and access to assistance is available outside of the lake boundary.

### Sightlines

As the open space is well-established, there is plenty of healthy, vigorous plant material located throughout the site. A City forestry representative was present on the dusk walk, and the team was able to identify with them areas of concern that inhibited sightlines, created concealed areas, and blocked lighting. This information can assist to address these concerns outside of the scope of the Beaumaris Lake Open Space Rehabilitation project. Other than vegetation, the sightlines in the project area are open and clear.

### Formal Surveillance

There is no formal surveillance within the open space. The question was raised during public engagement on the opportunity to include security cameras, or decoy security cameras (non-operational). The City currently does not monitor public parkland through security cameras, nor do they allow the installation of non-operational security cameras. The use of decoy cameras and / or cameras that are not functioning are not a recommendation to consider as they have been proven to give a "false sense of security".



# Geotechnical Investigation

The geotechnical scope of work for the preliminary design phase of the project was to complete investigation of the West Park, Promenade, and four Viewpoint areas. The East Park was not included in the geotechnical investigation as the rehabilitation in this area is primarily aesthetic. Following the drilling program, one Viewpoint was identified to remain based on the findings of a structural assessment.

The geotechnical scope included a desktop review, site reconnaissance, field drilling investigation, and geotechnical engineering analyses. The planned field investigation consisted of advancing 10 boreholes. A borehole within the West Park was planned; however, the drill rig could not traverse the stairs. A second borehole was planned but not drilled at the SE dock due to uneven ground and limitations with blocking the pedestrian trail. The information collected from the remaining boreholes was deemed sufficient by the consultant team for preliminary design purposes.

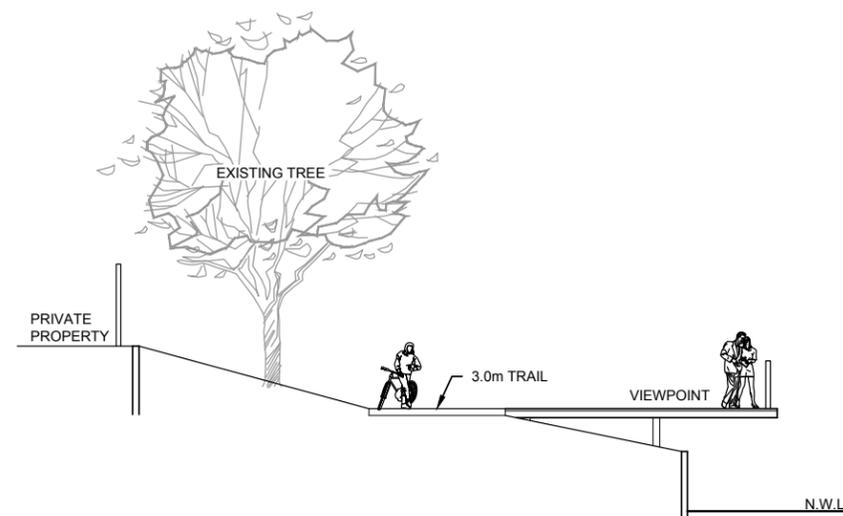
Based on the results of the geotechnical investigation it was concluded that the soil and groundwater conditions in the project site are suitable for the proposed development, providing that the recommendations outlined within the geotechnical report are adhered to. The full geotechnical report can be viewed in Appendix D.

# Structural Engineering

With the presence of several existing structural elements in the project area, as well as in the proposed design, structural engineering was a key component of preliminary design. The 2016 Beaumaris Lake Condition Assessment and Rehabilitation Plan identified the estimated remaining useful life for many of the structural elements within the project, including the lakeside retaining walls and the promenade. In addition to the structures identified in the Condition Assessment and Rehabilitation Plan, a visual assessment was completed for the integrity of the south retaining wall in the West Park.

## Viewpoint Structures

There are two existing viewpoints and three existing dock structures on Beaumaris Lake. The viewpoints were deemed to be in good condition, while the dock structures were very poor, with two of the three closed to public use. Due to their condition, user safety concerns, and EPCOR requirements, the docks are to be removed, and are proposed to be replaced with raised viewpoints, similar to the existing ones. The foundations for these viewpoints will be installed behind the existing lakeside walls, and the surface is designed to cantilever over the lake edge.

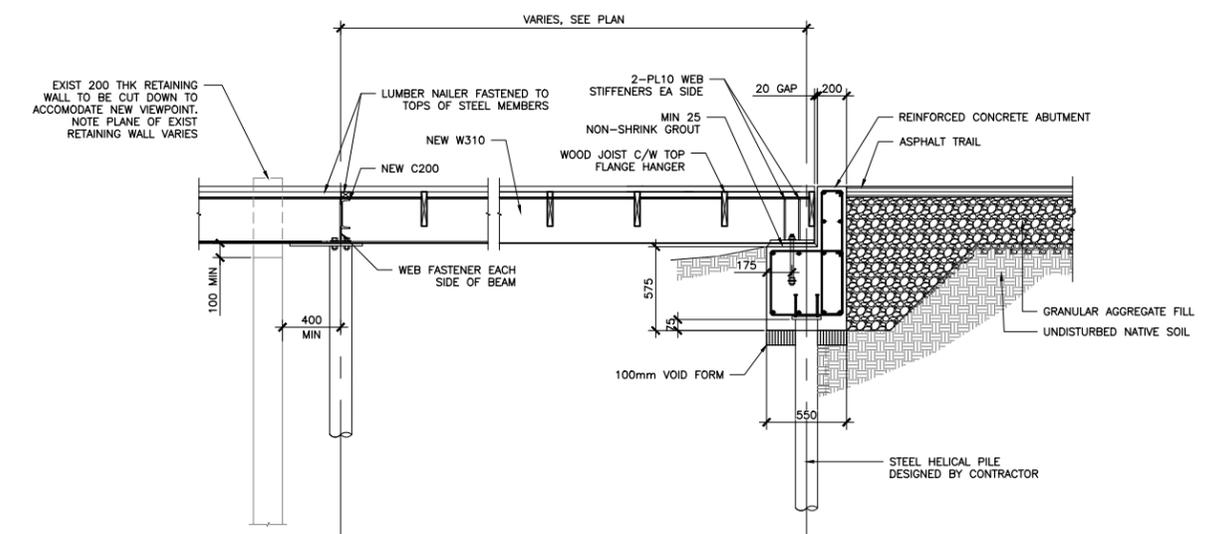


Typical Viewpoint Cross Section

## Existing Lakeside Retaining Walls

The existing lakeside retaining walls have been in place since the lake was constructed in 1978. The condition assessment identified their functionality rating as good, and their estimated remaining useful life as 25 years. Significant rehabilitation will be happening around the existing retaining walls; however, the new construction is designed to have piles founded well below the wall foundation to minimize / eliminate any surcharge on the existing walls.

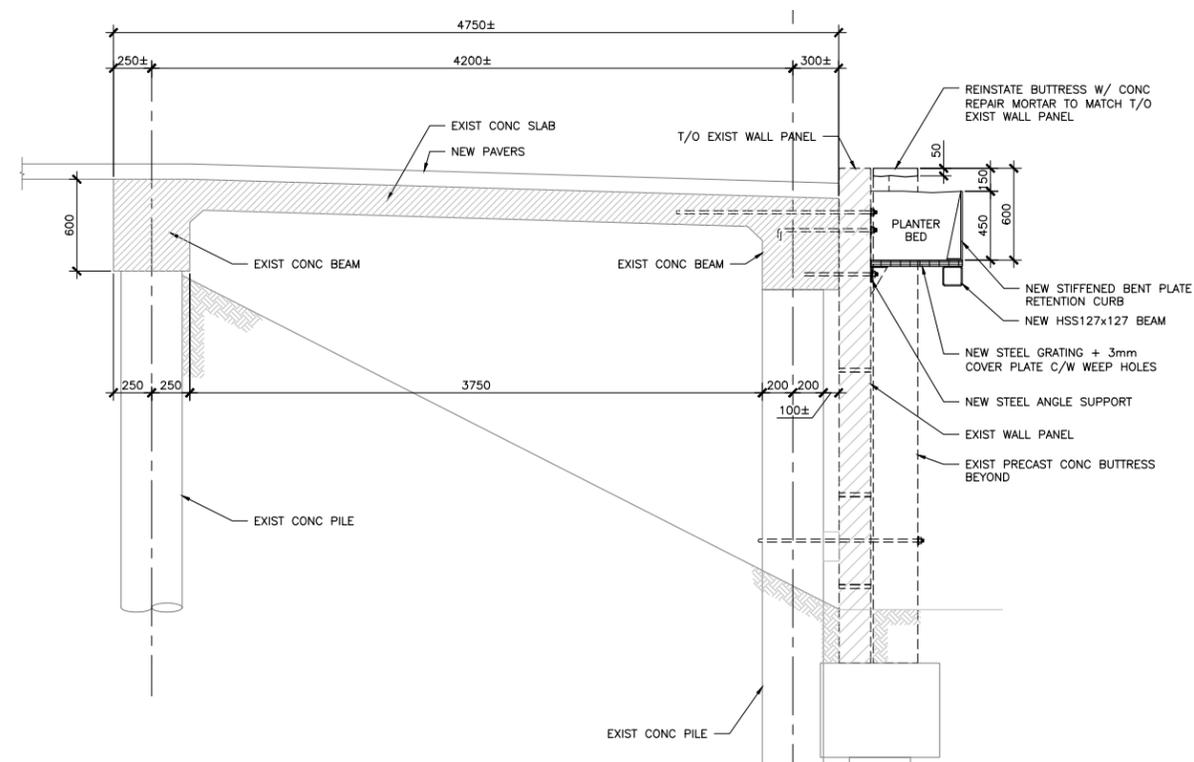
At Viewpoints 2 and 3 (refer to Project Context Map on Page 3 for locations), there are two tiers of existing lakeside retaining walls. The lower tier will remain as is, with the piles for the new viewpoints installed as described above. The upper wall extends approximately 1m above the existing grade and maintains the structural integrity of the upland trail and ground. The design for this is to cut the wall below grade and construct a new abutment atop the existing wall. This will maintain the integrity of the retaining wall, while allowing for the construction of the new viewpoint.



Altered Lakeside Retaining Wall Detail

## Promenade Structure and Planters

The Promenade is a major element of existing infrastructure at Beaumaris Lake. Extending almost the full distance of the west side of the lake, the Promenade is a significant visual location cue both while walking along it and from other locations along the trail. While the condition assessment identifies three components of the Promenade (1 – pre-cast concrete panels, buttress, and guardrail, 2 – concrete planter walls, and 3 – supported structural slab), the preliminary design impacts only components 1 and 3.



*Proposed Cantilevered Planter Detail*

## Component 1 – Pre-cast concrete panels, buttresses, and guardrail

The pre-cast concrete panels spanning the pre-cast concrete buttresses were deemed by the condition assessment to be in good condition with an estimated remaining useful life of 26 years, while the guardrail was identified to be in poor / very poor condition with the recommendation to replace immediately. The design for the project is to keep the panels and buttresses in place and remove and replace the guardrail. The buttresses are proposed to be cut and capped to facilitate the installation of a new guardrail.

The design of the cantilevered planters has evolved through the design phases in response to structural investigation, Operations feedback, and limitations in place from EPCOR. In concept design, the Promenade structure was proposed to be cut to accommodate the area required for soil and planting. Through further structural investigation, it was identified that this approach would not be achievable due to the hollow structure and the need to modify the piles holding up the existing slab. City Operations expressed their desire to be able to step onto the planters in order to maintain the plant material, so the first preliminary design of the cantilevered planters had piles extending into the lake in order to provide the structural support for maintenance workers. This design was not approved by EPCOR, as the intent for all new infrastructure was to stay out of the water. Therefore, the design was modified to remove the structural piles and span between the buttresses on the face of the pre-cast panels and anchor into the buttresses. The result of the planters will be a continuous soft edge around the lake, replacing the hard, utilitarian edge of the Promenade. The planting can also provide habitat for birds and water fowl found around the lake.

### **Component 3 – Supported structural slab**

Built in 1978 when the lake was constructed, the condition assessment identified that the promenade structure was “remediated” in 1982, adding a pile supported structural slab. The assessment noted there are periodic, not unexpected, cracks in the slab, and no visual indication of slab surface delamination or reinforcement corrosion, but no further testing (chain drag or hammer test) was completed, and the area below the slab was not reviewed. The City will be performing additional structural tests on the supported structural slab to inform detailed design.

The design to rehabilitate the Promenade area of the open space consists of placing paving stone and concrete surfacing on top of the structural slab. In detailed design, attention should be given to ensuring proper drainage between these surfaces and the structural slab, as well as mitigating the risk of differential settlement between the structural slab and the adjacent ground, which is already evident in the existing condition.

### **West Park Retaining Wall**

Though not originally identified for removal, observations on site led the structural team to complete a visual assessment of the south retaining wall in the West Park. This assessment observed that the wall was, in general, out of plumb from the west end to approximately 3m from the east end, with exposed rebar in several locations. The recommendations from the report advised that, if excavation of soil was required on the north side for the project construction, that soil be excavated evenly on both sides to prevent overturning. However, with new infrastructure being installed that will impact the existing wall, and the consideration of the potential need to replace the existing wall after the new infrastructure is in place, the recommended approach agreed upon by the City project team and the consultant team is to remove and replace the wall altogether. The full West Park Retaining Wall Field Review can be found in Appendix E.

During detailed design, consideration will need to be given to the tie-in location for the West Park retaining wall and the private retaining wall along the east side of the Sierras on the Lake development to avoid damage to the private retaining wall.

# Electrical Engineering

The scope identified for preliminary design was to remove all existing lighting, including concrete bases, abandon the existing power in place, and replace with new lighting along the trail and in the West and East Parks. After further consultation with the City's electrical engineering group, it was identified that the lighting within the project area, with the exception of the West Park, is currently an asset of EPCOR Distribution and will need to be transferred to City assets. The preliminary design has been updated to include new cabinets and meters to facilitate this transfer of assets, and drawings have been submitted to EPCOR for review. EPCOR is in the process of inspecting their assets around Beaumaris Lake in order to provide a plan on how best to service the metered cabinets. During Detailed Design, further coordination with EPCOR Distribution will need to take place to coordinate and finalize the electrical services and meter locations. Coordination with EPCOR during construction will also be needed for removal of the existing light poles, and installation of the cabinets and meters.



*Ashbery Light Fixture - Landscape Forms*

# Water Feature

During preliminary design, there were three options considered for the water feature in the West Park.

- Option #1: An interactive water feature (human contact allowed), with a potable water service and a sanitary connection.
- Option #2: An interactive water feature (human contact allowed), with a potable water service and drain into the storm pond.
- Option #3: An interpretive water feature only (no human contact allowed), that draws water from the lake, circulates it through the interpretive bioswales, and drains back into the lake.

Numerous discussions surrounding these options took place between the consultant team, City project team, and EPCOR representatives. Based on these discussions, the recommendation is to proceed with Option #2. The following elements are proposed to be incorporated into the design to allow Option #2 to operate successfully.



Water Feature Precedent Image

## Water Feature

The water source of the interactive water feature will come from a 50mm (2") water service that will be brought in through an existing walkway easement west of the park space. This feature will consist of three low flow ground sprays, as well as a push button activator, which will control the use of the water feature. The water from the ground sprays will drain to the center of the plaza and be picked up by a 100mm drain pipe to daylight and be released into the first tiered bioswale planting bed.

### Water Service

When reviewing the feasibility of providing a water service to the West Park for the water feature, the consultant team identified two possible routes, with :

- From the south (153 Avenue) through the property of the commercial area or Sierras on the Lake (distance of approximately 220m); or
- From the west (Castle Downs Road) through the transit centre and into an existing City of Edmonton walkway easement (distance of approximately 200m).

The team extensively reviewed both of these options and determined that servicing the water feature from the west would have the least time and financial impact to the project. While a cross-property easement exists between Sierras on the Lake and the commercial development, use of this easement would require coordination with the condo board of Sierras on the Lake and could be time consuming. The City could negotiate with the commercial development to obtain a separate utility easement through the property, however an easement already exists to the west of the West Park which can be utilized to run a water service. In order to limit disruption to transit operations, the project proposes to directional drill the service under the transit centre.

## Low Impact Development

Low Impact Development (LID) is a stormwater management approach that works with nature to manage stormwater as close to the source as possible. Traditional stormwater management would direct all rainfall and water runoff directly into underground pipes or stormwater management ponds (such as Beaumaris Lake). The purpose of LID is to infiltrate the water back into the ground to maintain the natural hydrology of a site and reduce the impact on existing storm infrastructure.

The intent for the West Park water feature is to have all surface runoff and water feature runoff drain into a bioswale system. The intent for this system is to provide almost total infiltration for the runoff from the water feature by the time it reaches the end of the system. Any excess water from the water feature will drain into the stormwater management facility. The bioswales will also provide infiltration for traditional storm runoff, such as rainfall and snow melt, with any excess also draining into the stormwater management facility.

## Treatment of Greywater through Phytoremediation

Phytoremediation is the direct use of plants for in situ, or in place, removal, degradation, or containment of contaminants in soils, sludges, sediments, surface water and groundwater. Phytoremediation is: A low cost, solar energy driven cleanup technique.

Since the costs associated with draining the interactive water feature into a sanitary line is not feasible within the budget of this project, the design intends to treat the greywater from the water feature with phytoremediation to ensure any contaminants that may be present will be filtered prior to the water entering into the stormwater management facility. The total length of planting features that the water will travel before it enters the storm water management facility is approximately 70m long. During this time much of the water will infiltrate through the soil and any excess will flow through to the storm water management facility.



*Phytoremediation Plant Material Precedent Image*

# Signage

During the design phases thus far, the project team identified the benefit of different signage types to enhance the experience at Beaumaris Lake for both active and passive recreation users. The preliminary design identifies locations for fitness signage for the open spaces, as well as interpretive signage to provide education on both the established plant material and wildlife around the lake, as well as the functionality of the lake as a stormwater management facility. A third type of signage that would be beneficial to the open space is wayfinding signage.

During detailed design, a graphic designer should be engaged to develop the signage visuals for these features of the project.

## Fitness Signage

Beaumaris Lake is a well-used location for running, walking, cycling, and other methods of active transportation. The design looks to enhance the existing fitness elements by providing 'fitness stations' with signage demonstrating various fitness activities that users can incorporate into their routines. Other distance markers can be placed around the lake to inform users on how far they have travelled.

## Interpretive Signage

Beaumaris Lake is Edmonton's first stormwater management facility, and a critical part of the storm system for the neighbourhoods surrounding Beaumaris. Because of its functionality as a stormwater management facility, there are a number of safety risks that make it unsuitable for recreational activities such as swimming or boating. There is an opportunity to work with EPCOR to create signage that will communicate the functionality of the lake and why certain activities are not allowed, as well as to work with plant and wildlife ecologists to showcase the existing natural beauty.

## Wayfinding Signage

Wayfinding signage is outside the scope of this project, however, with the lake being an attractive route to the commercial area on the west side, as well as for passive recreation, wayfinding signage should be considered by the City. As outlined in the EPS CPTED material, wayfinding signage identifying where users are and how to get to where they want to go also increases a user's feeling of comfort and safety in a space. During detailed design, Walk Edmonton could be engaged to review the wayfinding signage opportunities at Beaumaris Lake.



Interpretive Signage Precedent Images

# Regulatory Considerations

The following identifies the permits and approvals that will be required as the project moves forward.

## Development Permit

The project will require a development permit through Development Services, Urban Form and Corporate Strategic Development. Any variances to the Zoning Bylaw regulations will require a justification letter to indicate if there are unnecessary hardships or practical difficulties to meeting the requirements of the zoning and will include any solutions to reduce the impact of the variance.

## Encroachment Agreements

With the change of ownership of Beaumaris Lake from the City to EPCOR, encroachment agreements are required to be put into place for the existing infrastructure encroaching into the EPCOR property (the Promenade and one existing Viewpoint) as well as the proposed Viewpoints that will cantilever over the lake. The encroachment agreements for both existing and proposed structures can be established as part of the scope of detailed design, or the City can choose to address the existing encroachments outside of the scope of detailed design. With the proposed enhancements to the Promenade, it is recommended to include all agreements in the scope of detailed design. This would eliminate the need to go through the agreement process more than once. This process should be initiated at the commencement of detailed design.

## Servicing Agreements

With the water feature in the West Park designed to drain into the lake, a servicing agreement to allow the feature to tie into an existing EPCOR storm service will need to be established during detailed design. This process should be initiated at the commencement of detailed design.

## Parkland Bylaw and Corporate Tree Management Policy

Beaumaris Lake Open Space falls under the City of Edmonton's Parkland Bylaw and Corporate Tree Management Policy. The work for this project includes work around existing trees, as well as the removal of existing trees. A representative from Forestry has provided the project with an estimated cost to remove the trees identified by the project team, which is shown in the preliminary cost estimate. All trees to remain are to be protected during construction in accordance with the Corporate Tree Management Policy.

## Migratory Birds Convention Act

The Migratory Birds Convention Act is applicable to the rehabilitation of Beaumaris Lake. Prior to construction activity during breeding season (March to October), a nest sweep survey will need to be completed in accordance with the Act.



## Public Lands Act

The Public Lands Act is not applicable to Beaumaris Lake, as the lake is not a naturally occurring body of water, therefore does not fall under Crown ownership (Public Lands Act, 3(1)).

## Water Act

According to the Alberta Environment and Parks Fish and Wildlife Internet Mapping Tool, Brook Stickleback and Fathead Minnow are present in Beaumaris Lake. Due to the presence of these species, additional precautions must be taken during construction to avoid impact to water quality, fish or fish habitat, or water quantity in the lake.

## Environmental Protection and Enhancement Act

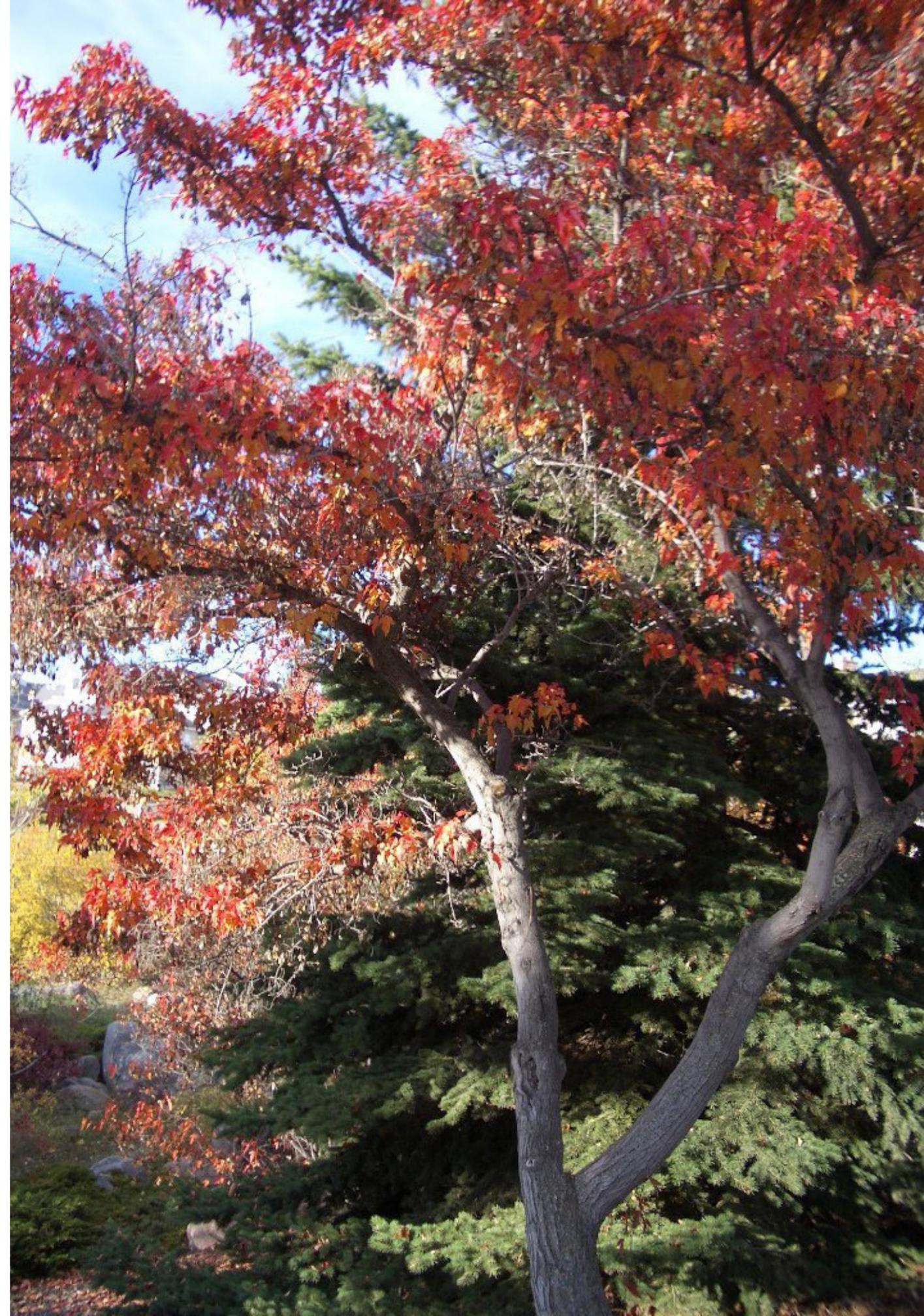
As a stormwater management facility, Beaumaris Lake falls under the Environmental Protection and Enhancement Act as a storm drainage system. Any modifications to the lake, especially modifying stormwater functions) require notification under the Act. The proposed project does not intend to modify the lake or the stormwater functions, however, the project team should be aware of the jurisdiction of the Act.

## Environmental Impact Assessment

In the City of Edmonton, an Environmental Impact Assessment (EIA) is required by the North Saskatchewan River Valley Area Redevelopment Plan. As Beaumaris Lake does not fall within this area, an EIA is not required.

# Tree Removals

Throughout the concept and preliminary design the residents have clearly identified the safety concerns caused by vegetation around the lake blocking sightlines in and out of the park spaces, as well as on the trails. As a result, the designs for both the West Park and the East Park include the removal a number of existing trees in order to facilitate clear views into the spaces and deter illicit behaviour. The construction of the raised Viewpoints will also remove existing vegetation, opening up sightlines between the trail and lake, and eliminating areas of concealment. It is recognized that the existing condition of the lake, including the vegetation, is a part of the uniqueness of the park, and the designs aim to balance the natural setting with the desire for a safe, comfortable experience.



# Maintenance

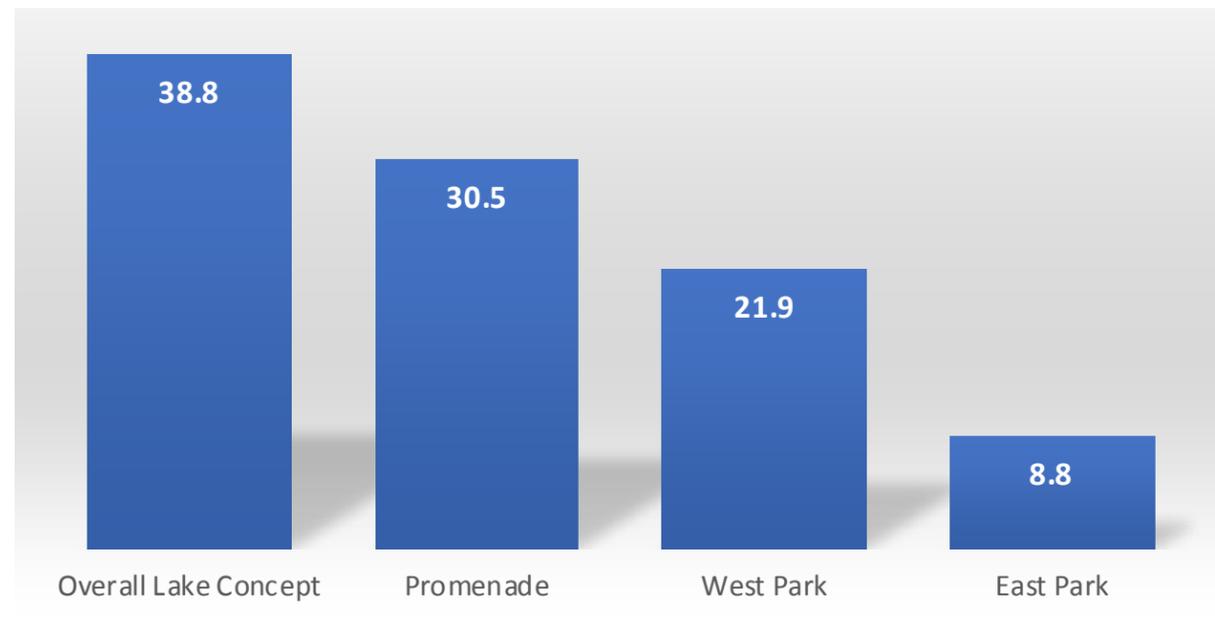
During preliminary design, feedback was gathered from City Operations representatives to discuss maintenance concerns and considerations for the proposed designs for the West Park, East Park, and Promenade. The main concerns for the Operations team were winter maintenance, such as snow removal, and maintenance of the cantilevered planters on the Promenade. In response, the hard surface areas have been designed with adequate width to allow for snow clearing equipment to easily access the sites in the winter.

The cantilevered planting bed along the Promenade presents a unique maintenance situation. As noted in the Structural Engineering section, the design of the planters has evolved through the design phases. Although Operations desired the ability to step onto the planters, due to the limitations listed in the Structural Engineering section, the design could not allow for this. As a result, the design has the planters slightly below the surface of the promenade, and the proposed railing is set back from the edge to allow maintenance workers to work on the lake side of the railing and clean out the planters when needed. The proposed railing will be designed with tie-backs and to support the weight of the workers.

Another item that was discussed with Operations was the wood surfacing for the Viewpoints. Currently, the surfacing is pressure treated wood decking. Our team discussed with Operations the possibility of using a wood composite surfacing, however the preference from Operations was to stay with the pressure treated wood.

# Construction Phasing

As the project is awaiting the completion of budget deliberations, a construction phasing plan has not been provided. During concept design, the public was asked to allocate budget amount to the West Park, East Park, Promenade, and Overall Lake Concept to identify their order of prioritization. The following graph represents the average level of priority as seen through the eyes of the community. The outcome of the budget deliberations will further inform the construction phasing for the project.



*Average Level of Priority (% of budget allocation)*

# Cost Estimate

Throughout preliminary design the project budget has been refined to respond to design modifications and additional items added to the scope of the project that were not identified in concept design. The following is a list of items that have affected the preliminary design cost estimate:

- Refinement of the design and grading led to the need for additional planting walls in the West Park in order to address grade changes.
- The boardwalk paving stone surface area on the Promenade was expanded during preliminary design to address the design intent.
- Due to the change in approach to the vegetated edge design (cantilevered planter vs. original concept to modify the structure), the cost of the planter is higher.
- Custom railing along the Promenade and Viewpoint edges has a higher cost than a catalogue product.
- Viewpoint costs are higher than anticipated.
- Additional cost was added to remove and replace boards / railings from all viewpoint locations.
- The addition of the trail spur lines (breezeways, extension to Castle Downs Road, etc.) have added additional cost for trail removal, new trail construction, and additional lighting.
- Additional cost was needed for the installation of meters and servicing charges for the transfer of asset from EPCOR to the City of Edmonton.
- Additional cost was added for City of Edmonton tree removals and compensation.

# Next Steps

## Future Design Phases

Following Preliminary Design, the project will move into Detailed Design, Tender, and Implementation. As part of Detailed Design and Implementation, the following services should be engaged:

- Public Consultation - continued communication to community residents and stakeholders regarding construction phasing, anticipated construction times, and expected impacts.
- Civil Engineering - underground utility coordination and site grading.
- Structural Engineering - detailed design of Viewpoints, Promenade planter, and other structural elements, such as walls and stairs.
- Electrical Engineering - detailed design of lighting and electrical components and coordination with EPCOR Distribution for asset transfer.
- Water Engineering - detailed design of water run-off for bioswales, and coordination with EPCOR Drainage.
- Environmental Services - project support for mitigation of risks to the native environment, nest sweeps, and ongoing review of applicable regulations.
- Landscape Architecture - detailed design of all site amenities, including plazas, trails, furnishings, plant material, vertical structures, and coordination with all previously listed disciplines.

Estimated duration of Detailed Design is 3-4 months. Following Detailed Design, the project will move into Tender and Implementation. Duration for preparation of tender documents, including the tender period, is estimated to be 6-8 weeks. Following tender award, construction can begin.

## Construction Considerations

As Beaumaris Lake is very well used, and well loved by the surrounding residents, consideration to communication and public access and safety should be given during the future phases. Regular updates on project status and changes in site conditions should be communicated to the public through the Community Stakeholder group, and through media publications.

During construction, it is important to maintain site access, and provide safe alternatives for the public to circulate through the site. Clear signage posted on site, as well as circulated communication, will help to keep everyone up to date.

# List of Appendices

APPENDIX A	Beaumaris Lake Condition Assessment and Rehabilitation Plan
APPENDIX B	Public Engagement 'What We Heard' Report
APPENDIX C	EPS CPTED Material
APPENDIX D	Geotechnical Report
APPENDIX E	West Park Retaining Wall Field Review
APPENDIX F	Preliminary Design Drawings

