Halifax Water Meeting Agenda

Haifax Water Board	
October 20, 2023 Virtual	2:00 p.m.
Colleen Rolllings, Chair	

REGULAR Agenda	Presenting	Time
Regular Reports		
1. Burnside Operations Centre	Director, Engineering and Technology Services	1 Hour
Motion: That the Halifax Water Board approve additional funding in the amount of $86,335,000 for the remaining phases of the Burnside Operations Centre project for an overall project cost of $89,100,000.		

Halifax Water

ITEM #1
Halifax Water Board
October 20, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: _____
Reid Campbell, M.Eng., P.Eng.
Director, Engineering & Technology Services

APPROVED: _____
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: Tuesday, October 17, 2022

SUBJECT: **Burnside Operations Centre**

ORIGIN

Halifax Water 2021/22, 2022/23, 2023/24, 2024/25, 2025/26 Capital Budgets.

Halifax Water Board Reports
- Item 6C – January 30, 2020
- Item 5.1 – November 26, 2020
- Item 4C-I – November 25, 2021
- Item 5.2 – November 24, 2022

RECOMMENDATION

It is recommended that the Halifax Regional Water Commission Board approve additional funding in the amount of $86,335,000 for the remaining phases of the Burnside Operations Centre project for an overall project cost of $89,100,000.

BACKGROUND

Halifax Water services a large geographic area and that is organized into three service areas – East, West and Central. In West region, a common depot, at 455 Cowie Hill Road serves as a base for water, wastewater and stormwater, metering, and water quality staff. The East and Central regions are serviced by four aging depots with one water depot and one wastewater/stormwater depot in

each region. The depots are at or reaching the end of their serviceable lives. In 2009, the depots were identified as requiring replacement due to poor condition, insufficient building size, features and yard space for material storage and parking. With Halifax Water's growing service boundaries and staff increases required to service that growth, Halifax Water's operational requirements have expanded and will continue to expand. Each existing depot is deficient from at least one of the following factors: building condition, staff space, yard space, staff parking, and ability to expand. One of the existing sites has been acquired by the Nova Scotia Department of Public Works and two of the others are land locked and unable to expand. A single combined depot located in the Burnside Business Park was recommended as the best approach for Halifax Water's customers, employees and the organization for the following reasons:

- Provides a similar level of service for all customers within the two regions.
- Prepares for anticipated future service expansion.
- Reduces life cycle costs compared to owning and operating the four existing facilities (versus two new regional facilities).
- Provides building operational cost-savings.
- Optimizes operations by co-locating similar operational services as well as support services.
- Offers economies of shared storage spaces, equipment, and materials.
- Improves communication and knowledge sharing between services by physically sharing space.
- Yields minimal impact on travel/response time to the two service regions.
- Contributes to creating a cohesive 'One Water' culture by bringing employees from different departments and depots together and helping to eliminate the existing operational silos based on geography and work function.
- Promotes increased employee morale in a work environment that is sized appropriately and outfitted to modern standards.
- Creates the opportunity to implement best practices to improve the work environment in the following areas: accessibility, inclusiveness, and psychological safety.
- Improves recruitment and retention measures by being designed for a diverse workforce that includes washroom, storage and shower facilities appropriate for all genders inclusively.

In 2009, the ***Halifax Water Facilities Requirements Plan*** reviewed the existing facilities inventory and the 20-year growth projections for the utility, assessed the limitations of the current facilities and provided recommendations to add additional space to meet anticipated operational needs.

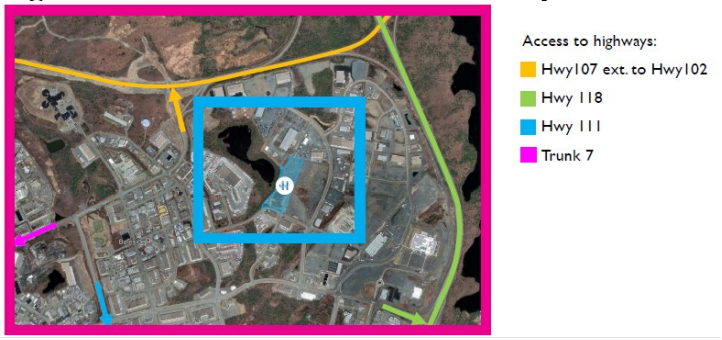
In response to the recommendations, an ***Assessment of the Potential to Combine Central and Eastern Regions Water, Wastewater and Stormwater Operations Centers*** report was prepared. The report highlighted the reality that three of the four existing operational facilities within the east and central regions were either at the end of their useful life, significantly undersized for current needs or being acquired by the Province for highway right-of-way. This assessment recommended a single combined operations facility to replace the existing four facilities.

A review of this recommendation and its impact on the utility in relation to its facility inventory and service areas was conducted through a ***Facilities Consolidation Study*** in 2014. This Study supported the assessment which concluded that a single combined East/Central Region, Water, Wastewater, and Stormwater operations facility optimally located within the Burnside Business Park area would offer numerous benefits.

Additionally, a location within Burnside Business Park area would position the utility well for future areas of growth – the Dartmouth to Bedford corridor along the Magazine Hill, and the Dartmouth to Fall River corridor. In 2018 and 2019, Halifax Water investigated available lots within the Burnside Business Park. Working with a construction industry consultant, the investigation identified a 14-acre site on Jennett Avenue that met the project requirements and Halifax Water entered into a purchase and sale agreement with HALIFAX.

In 2020, the Halifax Water Board and NSUARB approved the land purchase from HALIFAX for the new regional operations facility for a cost of $4,242,000. The new facility, referred to as the ***Burnside Operations Centre,*** will replace the four existing depots servicing the East and Central regions. The lot and proximity to major corridors are identified in Figure 1 below.

Figure 1: Lot for the future Burnside Operations Centre



Following the land purchase in April 2020, Halifax Water prepared and issued a public Request for Qualifications for consulting services associated with the new facility including technical, architectural, engineering, asset management, building commissioning and life cycle analysis services. The consulting services were based on a Design-Bid-Build methodology. Eastpoint Engineering was selected as engineering and architecture consultants for the new facility.

In March 2021, the Halifax Water Board and NSUARB approved the sale of the lands and premises for the Central Wastewater & Stormwater services depot located at 1 Mann Street in Bedford to the Province for the Province's Highway 107 extension project. Halifax Water is currently leasing the building and a portion of the lands from the Province. The lease is up for renewal in March of 2026 with flexibility of extension until Halifax Water's new building is completed and commissioned.

Halifax Water Staff Engagement 2021

The Halifax Water project team had originally determined that, as with most projects, engagement with staff who will be working in the facility would be important. It was necessary to get their views on the building's form and function to ensure it met the needs of the operations it is intended to support. The Halifax Water team also realized early on that the bringing together of 150+ staff from four separate locations and five different work groups created significant challenges. Each existing depot has its own culture and brings expectations around things like the commute, parking, interactions with co-workers etc. Additionally, no two existing facilities are the same in this respect. Considerable effort was therefore put into employee engagement to support the design process. The project team guided engagement with staff and served as a conduit for information to be shared back through the organization in support of ongoing change management efforts. Given the diversity and number of staff moving to the new facility, it would be impossible to fully meet everyone's expectations. It was, therefore, crucially important that all employees be given an opportunity to have their voices heard and know that their input was considered.

During 2021, an extensive internal stakeholder engagement process was undertaken to gather building requirements and an understanding of Halifax Water's current and future internal processes. Halifax Water staff and Eastpoint documented the current and future workflow practices at each depot and specifics on the functions each area in the building is required to meet. Multiple engagement sessions were held with staff, supervisors and managers at various depots. These engagement sessions included provisions of functional space requirement iterations and draft floor planning exercises to optimize the layout, workflow patterns and space dimensions.

The efforts also included sessions with current managers and supervisors operating from the 455 Cowie Hill Operational Depot as well as a review of recommendations made in the Facilities Consolidation Report in 2014. As the 455 Cowie Hill facility has been operating as a combined depot for the last nine years, it was used as a baseline to understand how spaces functioned well, where improvements could be made to the workflows, and how the building layout could improve and support the work being conducted.

Two thirds of Halifax Water's water distribution and wastewater and stormwater collections staff and the entire Technical Services group will be relocated to the new facility. Therefore, it represents an opportunity to also locate and improve access to internal operational support roles. Space was identified for other Information & Technology Services staff, a backup data centre, Human Resources support services, and vehicle maintenance areas and technicians.

With this information, Eastpoint presented various iterations of the space program for additional review and feedback to ensure all requirements were captured. The resulting ***Burnside Operations Facility Final Concept Design Report*** presented a summary of the functional spaces desired as well as three different building and lot layout approaches to meet operational needs. The report also provided a summary of building energy performance and sustainability targets that would contribute to reduced operational costs and could align with HalifACT 2050's new building goals.

Following the concept report, Halifax Water and Eastpoint Engineering undertook additional engagement opportunities with the future Halifax Water building occupants. During this period various building size iterations and optimization efforts were conducted as the project team challenged current processes and developed a better understanding of the potential utilization of functional spaces and future workflows. Those efforts included review and consideration of all spaces but in particular:

- Entrance and exit routes for personal and Halifax Water vehicles, site design and maneuverability around the site, parking, and yard storage. These were particularly important to maximize efficiency and safety on site.
- Vehicle bay size and the types and sizes of vehicles that require indoor heated parking.
- Vehicle maintenance area sized to minimize vehicle downtime.
- Selection of a building configuration that would promote scalability without significant renovations.
- Universal locker rooms, change rooms and washrooms to prepare for changing demographics and practices over the life of the building.
- Allocation of reasonable short-term expansion and vacant space.
- Review of functional needs to promote the sharing of spaces where possible.

Project Methodology

Halifax Water staff reviewed alternate project delivery methodologies, specifically considering approaches that would be more advantageous in a construction market that is experiencing significant volatility with labour resources and equipment manufacturing. It was felt that cost and schedule risks could be mitigated if an alternate project delivery model was utilized that incorporated collaborative and solution-based approaches with general contractors and trades.

With advice from subject matter experts, the project delivery methodology was converted from a Design-Bid-Build to an Integrated Project Delivery (IPD) model. The IPD model was selected as it is well suited to projects with costs and schedule risks, uncertainty, and complexity, and where a collaborative framework can be applied for genuine best-value and best-for-project decisions. In addition to team alignment, schedule and cost risk transparency, and owner integration into the solution, the overall benefits of selecting IPD include:

- Provides the owner a meaningful opportunity to influence the project outcome.
- Empowers more innovative project solutions and design excellence.
- Creates an opportunity to have a direct relationship with the designer.
- Integrates the “voice” of the contractor in the planning process through the establishment of a more proactive relationship.
- Promotes a collaborative relationship between owner and contractor, instead of the adversarial one found in other methodologies.

- Enhances project coordination and reduces likelihood of change orders and future project claims.
- Provides for a Design Validation Phase prior to Construction, which offers an exit ramp for Halifax Water.
- Balances the desire to collaborate and the ability to make informed decisions on scope and costs and manage market considerations that guide the design and construction process.
- Establishes the construction budget early in the process.
- Provides best value for funds invested.
- Reduces the project duration and avoids delays due to disputes or claims.

The IPD Methodology will be implemented in four phases:

Phase 1 – Design Validation (approved by the Halifax Water Board and the NSUARB and executed);
Phase 2 – Detailed Design & Procurement;
Phase 3 - Construction; and
Phase 4 – Warranty Phase.

IPD Procurement

Halifax Water staff issued a Request for Information soliciting interest in the Burnside Operations Centre project through an IPD process. Staff received responses from seven general contractors and five consulting firms which confirmed intent to participate in the planned Negotiated Request for Proposals (NRFP) process. The respondents were also requested to provide a high-level estimate of the time to complete the building after the IPD team is selected. The responses ranged from 24 to 36 months inclusive of a design validation phase.

In September 2022, the NRFP was issued, seeking a multi-party IPD team consisting of a General Contractor, Architect, Structural Designer, Civil Engineer, Mechanical Engineer, Electrical Engineer, Interior Designer, Energy Modeler, Mechanical Contractor, and Electrical Contractor.

At its November 24, 2022, meeting the Halifax Water Board approved funding of $2,765,000 for the design validation phase. This was subsequently approved by the NSUARB on February 14, 2023. A multi-party contract was executed in April 2023 with Bird-Chandos Joint Venture, Atlantica Mechanical Contractors, Group2 Architecture, CBCL and FBM as IPD Team partners.

DISCUSSION

Halifax Water staff are seeking Halifax Water Board approval for the construction of the Burnside Operations Centre at a total project cost of $89,100,000.

The previously estimated total Project cost was $52,000,000, as presented when the Halifax Water Board approved the $2,765,000 for Phase 1 of the IPD Project (Design Validation Phase) in

November 2022. The reasons for the increase include the building gross area is larger [9,230 m^2 (99,350 ft^2) vs 8,080 m^2 (87,000 ft^2)] and presents a better and more efficient space program. Additionally, the construction cost is considerably higher than the original estimate. As will be demonstrated in this report, the building is sized to meet Halifax Water's current needs and allow for future growth and to create a safe, healthy work environment. The building and yard design has been optimized through the design validation process. Any increase in building size since November 2022, can be attributed to the addition of functions consistent with Halifax Water's business plan or due to building code requirements.

Halifax Water staff are confident that via the IPD process, the cost as presented in this report is reasonable, fair and true to build the building as described in the design validation report. IPD greatly increases the likelihood that the project will be completed within the proposed total project cost. The contractor is incentivized through the IPD process to work with Halifax Water to manage, and in fact, reduce the project cost. Halifax Water staff has also done work to determine that the proposed cost is in alignment with similar local projects.

Phase 1 – Design Validation

This phase was approved and has been executed by Halifax Water. The objective of the Design Validation phase was to yield collective certainty and commitment to function, cost, and schedule on part of all IPD partners including Halifax Water as the Owner (i.e., the team): "We can build this building, that does these things, for this much money, in this much time". Initially, the background of the previously prepared Concept Design Report and the evolution of the concept drawings and estimated budget were reviewed. The business objectives, project history, previous engagement information and existing information and facts that might influence the outcomes of the project were presented by Halifax Water and shared with the entire team. The IPD partners also reviewed the expected outcomes in terms of expected details, required information, and the specific items that will need to be addressed to support life cycle costing.

During the design validation phase (Apr 2023 - Sep 2023) and building on the Halifax Water staff engagement in 2021, the IPD team facilitated a series of additional engagement sessions. This helped refine and confirm the site plan and building design that would meet Halifax Water's requirements and project values. While each session had a different focus and setup, the underlying goal of each session was to confirm the flow of the design to ensure it would meet the day-to-day needs of Halifax Water staff currently and in the future. Through this engagement, the groups collaboratively addressed questions, identified areas of agreement and disagreement in the design, and incorporated feedback into the design to reflect the needs of staff. The result is a building floor plan and site design that is practical, efficient and provides the flexibility required for changing business practices.

One of the other important outputs of these engagement sessions was to establish values specific to the Burnside Operations Centre project at the project outset. These included Conditions of Satisfaction ("CoS"), Key Performance Indicators ("KPIs"), and Team Behaviours. CoS outline

project priorities and guide decision making throughout design and implementation. The CoS are indicated below.

1. User Experience & Engagement
   The final project delivers a welcoming, comfortable, accessible, and inspirational work environment. Through an effective user engagement process, the design will reflect user input, providing a work experience that is safe, secure, and collaborative with efficient flow and connectivity of people, equipment, and processes. Users are proud of the final result.

2. Design Excellence + Functionality
   The entire facility is inclusive, inviting, and encourages optimal workflow. It is designed with the environment in mind and considers employee health and wellbeing. The facility is a Touchstone for organizational evolution to support, foster and serve Halifax Water's integrated service model.

3. Pride & Recognition
   Everyone involved in the project & operations are proud to showcase all aspects of the building & processes.

4. Sustainability
   We are environmentally sustainable to protect our natural environment for the betterment of Halifax Regional Municipality. We take this responsibility seriously and are driven to meet or exceed industry best practice. Value-added decisions will be supported by life cycle analysis to ensure efficiency, durability, and longevity.

5. Resilience & Future Flexibility
   The building and site design accommodate modifications and additions; that allows for changing business practices, growth, and expansion of services within the utility.

Project Costs

The estimated design and construction budget previously presented to the Halifax Water Board and NSUARB, inclusive of the Design Validation Phase was $46,535,000 with an overall project cost of $52,000,000 for an estimated 8,080 m^2 (87,000 ft^2) building.

Having concluded the design validation phase, the **Burnside Operations Centre Design Validation Report** summarizes with certainty that the IPD partners can complete the design and construction of the Burnside Operations Centre that meets the conditions of satisfaction indicated above by summer/fall of 2026 having a gross area of 9,230 m^2 (99,350 ft^2) for a cost of $75,112,030 (IPD Phase 2 to 4). See Table #1 summary of costs below:

Table 1 – Summary of Project Costs – 2022 & Current Funding Request

CATEGORY	COST ESTIMATE (APRIL 2022)	FUNDING REQUEST
IPD Phase 1 – Design Validation	$ 1,396,050	$ 1,396,050 (approved and executed)
IPD Phases 2 to 4	$ 45,138,950	$ 75,112,030
Total Design & Construction Cost Estimate	$ 46,535,000	$ 76,508,080
Insurance, Contingency (3%), Owner Equipment, ICIP Solar PV Funding and Moving Costs	$ 2,535,000	$ 3,941,700
Halifax Water's Recommended Additional Spend		$ 3,819,580
Sub-Total	$ 49,070,000	$ 84,269,360
Net HST	$ 2,103,140	$ 3,611,800
Halifax Water Contract Administration	$ 350,000	$ 350,000
Overhead	$ 515,231	$ 843,000
Total Project Cost	$ 52,038,372	$ 89,074,160
Total Project Funding (Rounded)	$ 52,000,000	$ 89,100,000
Previous Funding Received for IPD Phases	$ 2,765,000	$ 2,765,000
Current Funding Requested	$ 49,235,000	$ 86,335,000

The following factors contribute to the project's higher cost which are transparent and justifiable based on additions and refinement of scope and market conditions: Those factors are listed below with detailed explanations following:

- Direct Impacts
  - Cost Escalation
  - Code Changes
- Gross Floor Area Increases:
  - Functional Floor Plan Layout Improvements
  - Operational Process Improvements and Business Practice Changes
  - Improved Accessibility Standards
- Environmental Sustainability & Stewardship Leading Initiatives
- Life Cycle Cost Analysis Business Cases
- Ready to Move-In Costs
- Knock On Costs
  - General Conditions/Permits and RDCs
  - Escalation & Risk Contingency
  - Contractor Overhead & Profit

Direct Impacts

According to Hanscomb Quality Surveyors & Cost Consultant's escalation calculator on their website, the cost escalation from Q4 2021 to Q2 2023 is 11.2% for construction projects. In January of 2024, the 2020 National Building Code of Canada and the 2020 National Energy Code will come into effect. The previous structural and architectural design using the 2017 versions has been updated to reflect the new code with added insulation and additional structural steel for seismic loads. While the code changes result in improved building performance, they come at an increased capital cost.

Gross Floor Area Increases

Improvements to the building layout and interior functional areas as well as the addition of new spaces identified by operations to improve efficiencies and align with the goals of One Water, represented an increase in gross floor area of 1,135m^2 (12,000) ft^2) and the addition of the Dewatering Building to the scope from the concept designs presented in 2022. This represents a 14% increase in building area and a net new 400 m^2 (4,305 ft^2) building.

Those increases are a result of the following:

Functional Floor Plan Layout Improvements

Workshops - Through discussions with the IPD Partners, constructing the workshops to the same dimensions reduced interior block wall quantities and the trades time required to construct.

Safety Aisles in Bays – Dedicated wayfinding pathways along the permitter and centre of the bays were added to safely navigate staff through the bays while avoiding work areas and parked vehicles.

Boot Washing – A common frustration voiced by outdoor staff was the inadequacy of a space within the depots to properly wash off soiled outdoor gear and personally washup prior to entering the lunchroom and main office areas of the depots. Therefore, a boot washing/mudroom space has been centrally located and easily accessible area from the exterior for staff to hose off and remove any wet or dirty gear.

Mechanical & Electrical Rooms Sizes - Following selection of the HVAC system and a review of the communication requirements for data, voice and SCADA, the mechanical and electrical room sizes have been confirmed and are larger than anticipated at the concept stage.

Universal Locker Rooms/Change Rooms, Showers and Washrooms - Design strategies for universal washrooms and change rooms are an important part of the evolution of facilities and their best practice considerations. Halifax Water has a focused intention on improving the diversity of its workforce while also providing all employees with a safe, respectful and

inclusive work environment. Designing for universality now increases the area required but will reduce the future potential for retrofitting the building when our workforce is more reflective of the community it serves. Our goal with the current design and layout of these spaces is to reduce barriers to access for our vulnerable population and ultimately improve access for everyone as societal norms change.

Entrances/Exit Spaces and Stairwells - The number and size of the entrances/exits selected for the building is based on required egress measures combined with efficient access from the personal vehicle parking areas and access to the Halifax Water vehicles from the building. The sizes selected are designed for accessibility and the movement of material in and out of the building as required.

Operational Process Improvements and Business Practice Changes

Emergency Operations Centre (EOC) - The frequency and severity of natural disasters and multi-jurisdiction coordinated projects is increasing for Halifax Water. Currently, Halifax Water does not have a suitable dedicated space with suitable amenities, infrastructure and features to stand up an Incident Command System (ICS) team. A space within the Burnside Operations Centre has been allocated for this purpose.

Integrated Intelligent Command Centre – Halifax Water staff have identified the need for an intelligent, integrated control centre (IICC), as a critical enabler of future transformation and the achievement of Halifax Water's strategic direction. Providing a 24/7/365 service by monitoring our assets to understand risk to ensure we protect Public Health, the Environment, and our people, we would deliver the best possible service to our customers. This would enable us to substantially enhance our situational awareness requirements including:

- Creating the ability to improve the speed of identification of various business risks that have the potential to impact on the service to our customers.
- Ensuring we have the capability to link various sources of business intelligence including telemetry, customer, weather and workflow activity data, etc. to support the early identification and response to business events.
- Creating a system that will be flexible enough to both develop and enhance in house skills and experience, to meet future business needs.
- Providing a single hub for external stakeholders and service providers. This would include cyberinfrastructure monitoring.

Currently Halifax Water utilizes disparate systems, which are checked by various personnel. These interventions increase the chances of human error to occur as well as for the duplication of efforts. The use of, and investment in, technology increasingly enables us to provide even more resilient water, wastewater and stormwater services by assisting us to anticipate and forecast issues and, when any disruption does occur, helps us ensure we can return to normal operations as quickly as possible. Recent significant storms have shown how a smart, swift, customer-focused response supports a community’s return to

normality after adverse events. The IICC will become even more important in the future to ensure that vital services can be monitored and maintained in the face of challenges caused by a rapidly changing climate.

Dewatering Building – Five of the eight jet trucks utilized for cleaning wastewater or combined infrastructure will be stationed out of the Burnside facility. All jet trucks currently haul and dispose of vacuumed wastewater materials at the Aerotech WWTF lagoon. Each disposal run is costly for the utility due to operator time, fuel consumption due to the distance and added unnecessary vehicle operational and maintenance costs. The common location for both dumping and the homebase offers compounded benefits and opportunities for efficiencies and flexibility in changing business practices that will undoubtedly create additional savings for the utility that are currently not known or quantified. A preliminary business case was prepared which demonstrated that diverting the jet truck dumping from the Aerotech location to the Burnside Operations Centre will be slightly more cost effective than current operations. Through the next phases of the project, the business case will continue to be refined and updated. If the business case results are favourable for the building, it will be constructed as planned. If not favourable, project savings will result.

Occupational Health & Hygiene (OHH) Assessment Room - OHH assessment room and office is a practical addition to the functional program. With increased attention for personal service and assessment for our employes, this location is optimum with the majority of our outside depot staff stationed there. Additionally, the Dartmouth and Eastern Passage water supply and wastewater treatment plant staff will also be able to access these services and care more readily, cutting travel time significantly and time away from operational work.

Wet Lab – Water Small Systems - The team servicing the Halifax Water's Water Small System facilities were stationed at the Park Avenue depot and have been temporarily located at 450 Cowie Hill. The plan is to have them located at the Burnside Operations Centre permanently which is centrally located to the facility and the systems they service. The Water Small Systems conduct benchtop water quality lab analysis. A wet lab space has been identified within the building to undertake the testing safely with proper storage of chemicals.

Watershed Management Storage Space - The Watershed Management team for Halifax Water currently resides at the Park Avenue Depot. They will be relocated to the new Burnside Operations Centre when completed. They have several storage areas being rented that house boats, ATVs and other watershed management tools. With the building design, a secure area within the bay area of the building has been allocated for their storage which will reduce the costs associated with storage rental and the travel times in picking up and dropping off this equipment.

Improved Accessibility Standards

The Burnside Operations Centre is designed to be a safe, dignified, and inclusive facility to ensure that all staff can participate to their full potential. To enhance the level of accessibility and ensure universal access, the Operations Centre is designed to meet the requirements in the latest version of CSA-B651 - Accessible Design for the Built Environment and select criteria from the current Rick Hansen Foundation Accessibility Certification (RHFAC) Handbook. It is vital that the complete building experience be accessible for all staff and users. This includes providing safe and meaningful access to all areas and amenities of the facility including accessible parking, accessible workstations, elevators, and washrooms. This approach will benefit staff with permanent disabilities and staff or building users who experience temporary disabilities such as recovering from an injury or surgery.

Environmental Sustainability and Stewardship Leading Initiatives

Recognizing that not all decisions or recommendations will have favourable life cycle cost benefits, staff have identified the below stewardship measures within the planned design and construction of the new Burnside Operations Centre. Each of the elements align with Halifax Water's vision and values for the protection of the health and well-being of our population, our role as guardians of our natural resources and our objective to find ways to sustain our communities and the environment. The water conservation and stormwater management practices included are recommended and encouraged best practices for public and private enterprises.

Electrical Vehicle Charging Stations - Due to the growing number of electric vehicles in circulation, the design includes several level 2 chargers as well as the infrastructure (breaker, conduit and pull-box) for additional stations in the future. The design includes three double-head chargers at the employee parking lot and the infrastructure for one double-head charger located at the accessible parking, as well as infrastructure for a double-head charger located in the Halifax Water fleet parking area. Chargers will be added to the planned infrastructure as Halifax Water's use of electric fleet vehicles grows.

Underground Stormwater Storage - Best stormwater management practices dictate that all run-off point flows will be attenuated. Due to site constraints, stormwater management ponds are not a viable attenuation method for this project, therefore, Soleno Hydrostor underground storage units for the stormwater discharges were selected which will allow natural infiltration and groundwater recharge.

Bioswales - At the front of the property, bioswales will be utilized within the personnel parking lot to reduce impervious area and promote bioretention. The swales will be lined with drought resistant vegetation that will provide shade to the parking area and will allow the swales to be used for snow storage.

Underground Stormwater Collection Cistern for Water Reuse - The water usage by Halifax Water's vacuum truck and other water carrying fleet vehicles consume approximately

28,400 L/day. Utilizing the entire BOC building roof as the collection area and assuming a rainwater first flush filtration system would have a collection efficiency of 95%, a cistern in the vicinity of 200,000 L was selected for integration into the new building. Based on this size, it is estimated that 4,600 m^3 of domestic water could be saved each year.

Bird Glazing - Bird Safe glazing designed to CSA A460 Bird-Friendly Building Design will be used in the office portion of building. The glazing design includes visual markers in the form of small dots on the outside of the glass, hardly visible from the interior yet indicating a solid surface for birds from the exterior. This will reduce, but may not eliminate, bird injuries and deaths from window strikes. By incorporating bird safe lighting and glazing design, the Burnside Operations Centre will protect our natural environment for the betterment of Halifax Regional Municipality - demonstrating responsible stewardship and environmental leadership in a very direct and pragmatic way.

Building Certification

LEED (Leadership in Energy and Environmental Design) - During the design validation phase, energy efficiency and sustainability measures were explored and evaluated to determine which measures will be integrated into the project to reduce the life cycle cost of the building and to demonstrate environmental stewardship. LEED certification is a separate cost from the sustainability measures selected for a project. The merits of designing to the LEED standard and having the building certified as LEED were explored. Compared to the mandatory national energy code, LEED design offered little advantages, but the team went through a formal decision matrix to document the process of determining whether certification should be targeted and if certification would be recommended. There was not a positive business case to support LEED certification at an estimated cost of $619,000; hence, it was not pursued.

Zero Carbon Building Standard – The Canada Green Building Council estimates that buildings are responsible for 39% of the energy-related CO_2 emissions worldwide, of which 28% is from manufacturing construction materials. A product or system's environmental impact from its raw material extraction to its disposal is referred to as the product or system's embodied carbon. Embodied carbon is the sum of all greenhouse gas emissions released during the lifecycle stages of a product or system. The Zero Carbon Building Standard was selected to ensure scrutiny of the project team's decisions with regard to embodied carbon. The expected cost to conform with this standard is $60,000 which is marginal in comparison to the overall cost of the building. This standard has an appropriate level of challenge vs. achievability and low consulting and documentation costs. The Zero Carbon Building Standard guides the design teams in the selection and purchasing of materials and equipment that lower both the embodied carbon (the carbon generated from the building's materials from resource extraction through to end of life) and the operational carbon impact and energy consumption of the building (carbon generated from building operation over its life cycle).

Life Cycle Cost Analysis (LCCA) Business Cases

To demonstrate that sustainability measures are providing good value to Halifax Water customers, life cycle cost analysis have been conducted to ensure that final decisions on various technology options have considered the building life cycle cost and their environmental impact. The below highlights the opportunities selected for the project.

HVAC System Selection - Multiple HVAC systems were reviewed for the Burnside Operations Centre. System selection was based on efficiency, cost, sustainability, durability, and flexibility. A life cycle analysis was completed to compare the different mechanical system options. The baseline system for the analysis was a four-pipe fan coil system, with heating and cooling water provided by air source heat pumps with natural gas boiler backup. This system combination provides a balance between minimizing Greenhouse Gas ("GHG") production and minimizing installation cost and operating cost over the life of the building. Although the capital cost is slightly higher than a chiller with natural gas boiler system combination, the life cycle cost was lower. A complete electric system was evaluated as well consisting of electric chillers and boilers, the life cycle cost was much higher than the base design proposed.

Solar PV System - Halifax Water received project approval and ICIP funding to install solar PV on three Halifax Water buildings; the Burnside Operations Centre was one of those buildings. The project had an approval for a 100 KW (AC) system which equates to an approximate 130 KW DC system. A similar sized system was also planned for installation on the roof at 455 Cowie Hill; however, due to structural inadequacies, it would not be possible. Therefore, the ICIP funding allocated for 455 Cowie Hill was transferred to double the size of the solar PV system on the roof at the Burnside Operations Centre. Solar PV funding has been made available in the amount of $765,980 for this project with a 40% contribution from the Government of Canada and 33.33% contribution from the Province of Nova Scotia.

The IPD Team reviewed the additional capital and life cycle costs to expand the initial solar PV system provided to a 475 kW DC system total which would utilize the full 2nd floor roof area available. The life cycle cost analysis is favourable, and the full suite of PV has been included in the proposed capital cost. This would position the building with sufficient PV that would be close to achieving Net Zero Energy in alignment with HalifACT 2050. Possibilities for achieving net zero will be reviewed with additional PV added to the second-floor expansion roofs, the covered parking area roof and/or Building Integrated PV (BIPV).

Roof Material - Several roof assemblies were assessed based on cost, durability, and lifespan. While 2-ply modified bitumen ("mod-bit") is a common choice, the lifespan of 10-20 years is significantly shorter than the expected lifespan of the PV system, which is 30-35 years. Ethylene propylene diene terpolymer roofing membrane ("EPDM") with stone ballast for a lifespan of 20-25 years was also evaluated. Inverted hot-rubberized

asphalt with its 30-35 year life span, while a higher capital cost, has a lower life cycle cost due to alignment with the expected life span of the PV system.

Recessed Entrance Mats - Recessed entrance mats were selected as the preferred option versus throw down mats which are laundered weekly. The laundering costs of mats over a two-to-three year period would cover the costs of the recessed mats that will have a life span of five to ten years. The recessed mats also offer the following advantages: improved safety; less tracked debris through the building; reduced cleaning and maintenance; meets accessibility standards, better indoor quality; and enhances first impressions.

Ready to Move-In Costs

Building construction costs typically exclude costs associated with furniture, fixtures, equipment, shelving, window furnishings, lockers, AV equipment, shop equipment appliances and building security and access requirements due to uncertainty of scope. During the Design Validation Phase, these items were reviewed resulting in confirmation of scope and costs. These costs were not included in the previous estimate but would be needed and are now known and included in the current funding request.

Knock-On Costs

Knock-on costs are considered those costs that are tied to building area, regional permit requirements, and resulting design and construction. These costs cannot be established until cost and scope certainty are achieved.

A graphical summary of the relative impact the above factors have on the costs above and beyond the previously estimated cost presented is depicted in Figure 2.

Figure #2 – Graphical Depiction of the Factors Contributing to the Higher Project Cost

Recommended Additional Spend

Although not required as part of this initial building, Halifax Water Staff are recommending the following additional scopes of work identified on the Wish List in the Design Validation Report be included in the initial building and site work to minimize future costs of redesigning the areas including meeting latest codes, logistics and time required to facilitate the renovation process and procurement and execution of construction activities. Expansion and inclusion of these spaces and services now will be much less expensive than doing so in future. These proposed additional scopes include the following:

- Expansion of second floor over the first-floor single height areas on east and west side of building with inclusion of additional solar PV on the added roof areas.
- Inclusion of another bay in the warehouse with additional solar PV on the added roof area.
- Construction of the covered parking canopy on the east side of the lot.

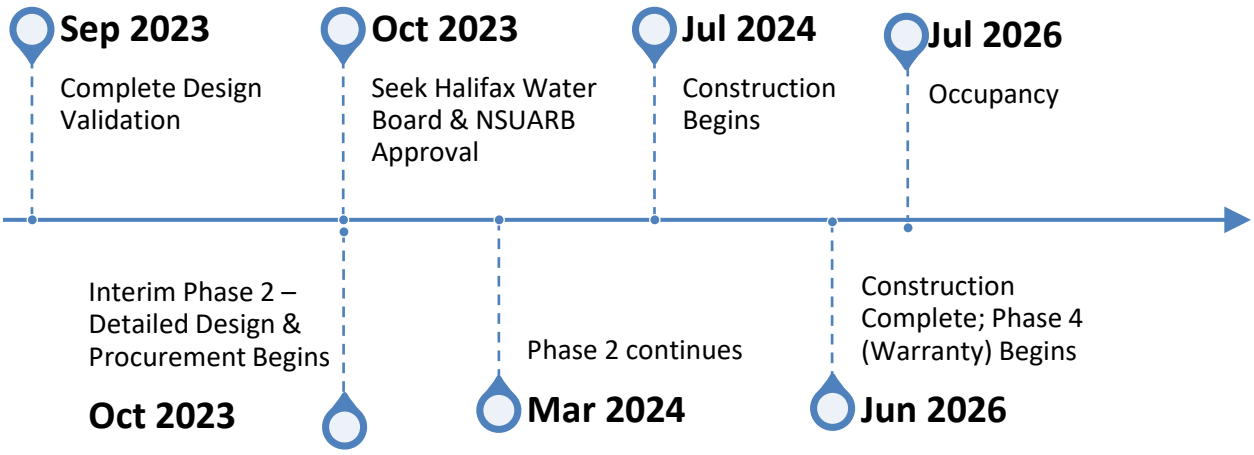
Financial Transparency

The costing presented in the Design Validation Report has thoroughly been dissected, reviewed, and edited based on feedback from all the IPD partners including Halifax Water. The IPD process has afforded Halifax Water staff and the other design partners an opportunity to witness and understand the consequences of various design requests and owner requirements on construction costs and schedules. The cost represents the true cost of the project based on the best available real-time information and scoping, that the IPD team can deliver in confidence within the schedule indicated. The same level of transparency witnessed during the design validation phase will continue throughout the remaining phases of the project.

As part of the Design Validation Phase, a third-party cost estimator reviewed the design validation report and provided a high-level cost estimate for the building's construction. Their estimate supports the IPD Teams' costing proposed and where there are differences, they are justified by differences in scope, local realities of material and labour market conditions, and additional items not included in Atlus' scope.

Schedule

The Project Schedule was developed under a true collaborative process inclusive of all team members. A summary of the scheduled key milestones is presented below.



BUDGET IMPLICATIONS

The Burnside Operations Centre project is a capital project that will be funded by long-term financing options which are incorporated into future rates paid by Halifax Water customers. Increases to the future years' budgets will be included in the proposed 2024/25, 2025/26, and

2026/27 Capital Budgets as required to match the additional funding requirement. Capital Budgets will be presented to the Halifax Water Board for approval in future fiscal years. Increases in Capital Budget will be funded by rates, RDC charges collected to fund growth and any federal or provincial funding. Halifax Water is aware of and assessing the impacts of the Provincial government's intention to amend the HRM Charter and potentially freeze rates and charges related to development approvals. At this point in time, Halifax Water does not anticipate any significant impacts to this project as a result of these amendments. If this changes, Halifax Water will advise this Board accordingly.

Solar PV Project Funding

Halifax Water staff have also secured Investing in Canada Infrastructure Program (ICIP) funding under the Green Infrastructure, Climate Change Mitigation stream to install a minimum 200 kW (AC) Solar PV system on the roof of the Burnside Operations Centre. Funding has been made available in the amount of $765,980 for this portion of the project with a 40% contribution from the Government of Canada and 33.33% contribution from the Province of Nova Scotia.

Future Revenues from Sale of Existing Properties

The sale of the existing properties will occur at a future date and will not impact the funding of this phase of the project.

The results of the 2019 preliminary market property valuations and reassessments in 2022, are indicated below.

Table 2 - Existing Depot Property Valuations

Property	2019 Valuation	2022 Valuation	Increase
35 Neptune Crescent	$ 978,000	$1,265,000	29%
Ragus Road (Vacant Lot at Neptune)	$ 565,000	$668,000	18%
213 Bissett Road	$ 325,000	$546,000	68%
2 Park Avenue	$ 1,172,000	$1,414,000	21%
Total	**$ 3,040,000**	**$ 3,893,000**	**28%**

The Neptune Crescent, Ragus Road and Park Avenue will likely achieve the anticipated sale price when they are sold, as they do offer many amenities that will be attractive in the commercial real estate market. However, the expectations for sale of the Bissett Road Depot at the assessed value are being cautiously lowered to account for potential issues associated with its lot use history prior to Halifax Water and the current building conditions.

As part of any sale, Halifax Water will assess whether any issues exist on each property and conduct remediation and/or abatement, as necessary. Halifax Water will optimize the sale of the property as required. The properties for the existing depots will be marketed and sold once the new Burnside Operations Centre is complete.

The net proceeds from the sale of each property will be used to fund capital projects consistent with the service for which the sold property was used. As such, the proceeds from the sale of water facilities will fund water capital projects or the water portion of a corporate or shared project and proceeds from wastewater/stormwater facilities will be used to fund wastewater/stormwater projects or the wastewater/stormwater portion of a corporate or shared project.

Other Potential Funding

There may also be other opportunities to secure funding through government grants which would reduce the need for long term financing (ex: Green Municipal Fund administered through the Federal of Canadian Municipalities). Halifax Water will continue to pursue such funding opportunities and report to this Board accordingly.

Table 3 - Funding Approvals & Estimated Budgets

Item	Estimated Cost	Total Cumulative Cost
East/Central Regional Facility Study	$ 60,000	$ 60,000
Lot Investigation & Purchase Due Diligence	$ 100,000	$ 160,000
Land Purchase Approval	$ 4,242,000	$ 4,402,000
Phase 1 – Preliminary Design Services	$ 190,000	$ 4,592,000
Phase 2 – Detailed Design and Tendering Services	$ 810,000	$ 5,402,000
IPD Phase 1 – Design Validation & portion of Phase 2 – Detailed Design & Procurement	$ 2,765,000	$ 8,167,000
Total Approved to Date		$ 8,167,000
IPD Phase 2 – Detailed Design & Procurement and Phase 3 – Construction & Occupancy	$ 86,335,000	$ 94,502,000
Total Estimated Project Cost (including land purchase and preliminary investigation)		**$ 94,502,000**

The funding currently allocated for this project this fiscal year and subsequent years is as follows: $4,300,000 in 2023/24; $21,000,000 in 2024/25; $20,000,000 in 2025/26 and $4,000,000 in 2026/27 which totals $49,300,000. The annual capital budgets for 2024/25 through to 2026/2027 will be updated to reflect the additional funding required and the final construction schedule.

The proposed expenditure meets the "NO REGRETS - UNAVOIDABLE NEEDS" approach of the 2012 Integrated Resource Plan. The proposed work meets the NR-UN criteria of "Directly supports the implementation of the Asset Management program". The project meets this criterion based on the following: The existing East and Central depots are either at the end of their useful life, significantly undersized for current needs or have been acquired by the Province (Asset Management).

RISKS

Cost – With execution via an IPD methodology, this will most likely be the last request for funding because all contingency and profit must be exhausted by the IPD team before Halifax Water would require additional funding. If the IPD exhausts their contingency and profits, the amount of additional funding required will only be representative of actual costs only and excludes any profit. Therefore, there are substantial controls within the IPD framework to limit this amount. Halifax Water maintains audit rights from start to finish of the project.

Conditions that may require additional funding are any scenarios outside of what the IPD team is required to perform in accordance with the contract and the design validation report. This includes any Halifax Water driven material changes or any extraordinary conditions beyond either the team's control or what can reasonably be expected.

Schedule – There are inherent risks associated with the schedule should the funding approval be delayed beyond April 2024. If delayed the construction schedule would shift and the time and costs of additional winter construction would also be encountered. There would also be unquantifiable risks associated with impacts because of trade contractors' collective agreement negotiations which are scheduled for 2026.

Quality – There are minimal risks associated with quality as the project is implementing digital construction initiatives to minimize the risks associated with conflicts, duplication and equipment and envelope commissioning.

There is a comprehensive Risk Registry that has been developed and will continue to be reviewed and updated at regular intervals throughout the project life.

ALTERNATIVES

The Halifax Water Board could direct staff to not proceed with this project. Not proceeding is not recommended as all of the current depots are facing end of life conditions and Halifax Water staff are confident that the recommended building meets Halifax Water needs at a fair market cost. Further, Halifax Water has already purchased the land to accommodate this depot, an expense which was approved by this Board and the NSUARB.

A strategy of renovating and upgrading current depots is also not recommended. 2 Park Avenue currently does not have sufficient land for its current operations. Mann Street has been purchased by NSPW. Bissett Road does not have sufficient land and would require a complete rebuild instead of a renovation. Only Neptune Crescent has possibility for renovation however it is remote from the Central area and would not be suitable for serving two regions.

The Halifax Water Board could direct staff to proceed without the dewatering building and without the additional recommended items. Although this would reduce the short-term capital cost of the

building, it would result in increased future cost to expand the BOC and in operating costs for the jet trucks without the dewatering building.

The Board could direct staff to pursue the building of two new depots. This is not recommended as the long-term costs for doing so are higher based on analysis done in 2015 and updated in 2019. Additionally, smaller buildings would be under the same cost pressures as a single large depot would be.

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