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Technical Memo

Subject: **Soper Park - Existing Washroom Building Assessment and Option Costs**

Introduction

Soper Park Washroom Building is located at 41 Marion Way in Cambridge. The City of Cambridge has demolished and removed the swimming pool and most of the concrete pool deck. The city is evaluating four building options. These include: full renovation; partial demolition and partial renovation; full demolition and re-build with a smaller building footprint; and full demolition with no re-build. The existing washroom building is shown in **Figure 1** below.

Figure 1: Soper Park Existing Washroom Building



This memo summarizes AECOM's site investigation, infrastructure and building review. AECOM undertook a background and site review of the existing building, sanitary, electrical, and mechanical systems.

Options and costs have been broken down below highlighting what adjustments, new building improvements and infrastructure improvements need to occur with each option.

Background Review

The existing washroom building was constructed in 1967 as a shower and change room with a basket room, reception, office, concession stand/room, mechanical and electrical room to support the in-ground swimming pool.

AECOM has been retained by the City to review the existing architecture and building systems to identify potential issues/constraints and opportunities by investigating four options: full renovation; partial demolition and partial renovation; full demolition and re-build with a smaller building footprint and full demolition with no re-build.

The existing topography falls in elevation from Marion Way toward the park where stormwater disperses and drains away into the grassed areas surrounding the existing driveway and around the existing building.

Site Assessment

Mechanical

Plumbing

Domestic cold water (DCW) is provided to the building via a 100mm (4") diameter underground water service from Marion Way. The service has been reduced to a 50mm (2") after entering the building and passes through a 50mm (2") water meter and back flow meter. DCW is distributed throughout the building to existing washroom/service fixtures using copper piping.

Domestic hot water (DHW) is generated at the building using a 200 MBH (58 kW), standard efficiency (80% efficiency), gas-fired water heater/storage tank.

According to reports generated by NA Engineering in 2017 the building is served by a 100mm (4") diameter sanitary (SAN) line. There is no storm (STM) service for the building (rainwater drains directly to grade). The pool deck and the pool room drain however are drained to a 5" (125mm) diameter STM line whose outlet is located at the nearby creek.

Natural gas is provided to existing building, likely from Marion Way. A pressure regulator is located along the exterior of the south-east wall of the building with a spring range of 6 to 8" WC (1.5-2 kPa). An 800 CFH (22.6 CMH) gas meter is located inside the building. Natural gas is used for DHW production, along with a pool heater.

Heating, Ventilation, and Air Conditioning

As the existing building is not insulated, the existing building has not been provided with heating or cooling except for a single 1 kW electric radiant heater; located in the Lifeguard/Pool Observation room.

Ventilation is provided for the washrooms and service spaces via exhaust fans. There appears to be no supply air system. Makeup air is pulled from infiltration through the envelope.

Fire Protection

The building is not equipped with a sprinkler system.

Miscellaneous Systems

The building is equipped with chlorine gas detection system serving the closet housing the pool chlorine bottles, along with the mechanical room.

Electrical

Electrical Servicing

Main power to the site is provided from a 150kVA underground utility service from a hydro pole at the property line to the site service meter base at the northeast side of the building. This connects into the main distribution splitter located in the Filter Room on the northeast corner of the building, and then distributes power throughout the building.

Building power distribution is a 200A, 3 phase, 4 wire 120/208V splitter. The main power distribution splitter provides power to panels and loads throughout the building. These include a 100A rated distribution panel in the Guard Room that serves the lights, a 60A line that serves the area floodlights (removed), and a 100A line that serves the recirculation pump. There are no provisions for backup/standby power generation at this site.

Lighting

Interior lighting consists of T12 fluorescent luminaires, which should be replaced to LEDs for energy efficiency. Emergency lighting was not tested at the time but appear to be at the end of useful life. Site lighting has been removed.

Communications

A POTS (Plain Old Telephone Service) was observed in the building. It is unclear if this connection is currently in service. Conduit provisions could be provided should the building need to be equipped with a more current communications service.

Fire Alarm

The building is not equipped with a fire alarm system.

Existing Building

The existing single-story slab building (270 m²) building on grade is approx. 55 years old and is predominantly inner wythe block work with outer wythe brickwork. Its roof structure comprises two pitched sections each of wood rafters and shingles of ply decking with one ridge higher than the other leaving a vertical section of wall/clerestory glazing. There appears to be no roof insulation visible and due to age of construction would suspect little or none in the wall. Even though the potential use of this building could be seasonal, depending on the work proposed it may make sense to consider some insulation.

It is in reasonable condition for its age, but despite maintenance is showing signs of needed work.

The existing wood or metal frame windows and existing wooded and full glass metal doors require work, so whichever option is chosen, budget should be allocated for these renovations.

The height of the eaves approximately 8'-6" which make climbing onto the roof relatively easy. This should be kept in mind when looking at roofing upgrades.

With the swimming pool now being removed there is additional space in rooms previously housing the tuck shop, program areas, pool equipment and pool infrastructure. These spaces can now be converted and used to support any proposed amenity features or utilized as part of re-purposing and expanding the washroom and change rooms.

Building Assessment, Improvement Options and Estimated Costs

Option 1 Full renovation.

Option 2 Partial demolition and partial renovation.

Option 3 Full demolition and rebuild with a smaller building footprint.

Option 4 Full demolition with no-build.

Summary and Recommendations

AECOM provides the following recommendations in support of a full renovation, partial renovation/removal/ full removal, and full replacement.

Option 1: Full renovation. – Estimated Cost \$1,122,250

- Landscape work
 - Landscape related works shall be covered in the amenity design and detailing.
- Architectural work
 - The original building program and likely proposed program do not match in terms of types and size of spaces and adjacencies, and there will be potential real estate that can be picked up for other uses.
 - From a cost perspective maintaining the plumbing in areas of existing washrooms/showers would be recommended, and the layouts look as though they could be suitably adapted.
 - The change rooms can be decreased in size to provide change facilities for a splash pad. Discussion should be held as to whether a single change area be family type and washrooms by gender are included separate from the change area, or whether the city want to consider gender neutral design throughout.
 - A more significant renovation approach could entail making a series of individual gender-neutral combined change/washrooms along the splash pad side of the building, reminiscent of traditional Victorian beach changing huts. This could introduce color and vibrancy that is missing from the park.
 - While structural/building fabric costs could be more, this option would avoid the issue of overcrowding in one gender or another and allow for easier cleaning/maintenance procedures (without shutting down complete change rooms).

- The main service room would be retained, and equipment adjusted to suit site needs (with the addition of splash pad equipment within the existing service room).
- The former tuck shop space would likely not be reused and this along with some of the adjacent space could be repurposed for other uses such as to provide storage for bikes (which could be rented and accessible outside of the building but brought in at night/off season).
- General Park storage for uses at the park, ping pong paddles and balls, pickleball nets etc. if were to be considered could be also included. It should be noted that several of these functions would require staffing this location (with cost, safety, and security issues to be addressed).
- Alternatively, subject to this location in relation to other City parks, could be used to house central parks storage (materials, fertilizers, tools, etc.) in addition to a maintenance space (to maintain and/or repair mowers, park equipment, park benches, unless these functions are adequately managed at other location(s)).
- We would recommend improving the visual appearance of the building with various wall options ranging from painting the brick, to over cladding with siding, to a render (especially if insulation was to be proposed). Each of these options can be reviewed with respect to vandalism (though there weren't too many signs).
- Similarly, a re-roofing (the shingles will have a limited life remaining) should be considered for both performance and aesthetics. Using profile metal sheeting (with or without insulation) would provide a more durable and long-lasting roof surface. While potential of green roofs or PV panels were discussed, the additional weight impacts on the structure and the relatively easy access for non-authorized access onto the roofs would be factors against their inclusion in the project.

■ Mechanical work

- Plumbing work
 - Plumbing fixtures will be replaced with new commercial grade, low-flow fixtures based on the new program layout.
 - DHW plant to be replaced with a new high efficiency (96% efficient), gas-fired, condensing water heater system, instantaneous heater if practicable, and re-sized for new program layout.
 - Piping layout to be modified to accommodate new program layout.
- HVAC work
 - Building will remain unheated and uncooled due to the fact the building will remain uninsulated.
 - Exhaust fans serving washrooms/service spaces to be replaced with new exhaust fans complete with variable speed and occupancy sensors for power savings if practicable. Fans to be re-sized for new program layout.
 - Ductwork layout to be modified to accommodate new program layout.
- Fire Protection
 - Building will remain un-sprinklered.
 - Fire extinguishers to be provided to accommodate new program layout.

■ Electrical work

- Full replacement of electrical systems, electrical service to remain.
- Two (2) to four (4) electrical panels, wiring, new lighting, and lighting controls, exit signage, outlets.

- PROS:
 - Washroom facility is provided for site visitors.
 - Fulfills recreational needs (e.g., Community Garden use, sports equipment storage, bike rentals usage, indoor program space).
 - Low operational costs (no heating or cooling costs, ventilation and DHW production only).
- CONS:
 - High capital cost.
 - Building can only be occupied for 3 seasons (no heating, code minimum heating cannot be maintained).
 - No change to risk of loitering and vandalism.

Option 2: Partial demolition and partial renovation. – Estimated Cost \$947,250

- Landscape work
 - Landscape related works shall be covered in the amenity design and detailing.
- Architectural work
 - If all the available space is not required or would serve a logical use, then a partial demolition could take place. This can be from removing one end of the building or removing a section from the middle and creating a covered/sheltered space (for rain or sun shading purposes).
 - Removing one end or the other could be as simple as a straight cut or a section of roof overhang could be provided. With this being open on 3 sides it would lend itself to greater casual surveillance by the public to reduce potential incidents on site.
 - Which end is removed would depend on what functions are to remain on site. If there is a need for significant servicing, then the east end could remain, however if the modified remaining building was to contain more support spaces, then the north end could remain.
 - In each of these options for the existing washrooms/locker rooms could be reconfigured to provide new washrooms.
 - If the option is to keep the ends and remove the middle, a central gathering/sheltered breezeway space can be created. While this is beneficial from sun shading and rain cover it is however a little less visible (walls on 2 sides and open to the front (west side) and park (east side), so likelihood of unacceptable activities could occur. For this reason, we would recommend shelter be provided at one end only.
 - Washroom and change areas would follow a similar design approach to Option 1.
 - Like the option above, a reimagining of the facility by changing its appearance would benefit the neighborhood.
- Mechanical work
 - Plumbing work
 - Plumbing fixtures will be replaced with new commercial grade, low-flow fixtures based on the new program layout.
 - DHW plant to be replaced with a new high efficiency (96% efficient), gas-fired, condensing water heater system, instantaneous heater if practicable, and re-sized for new program layout.
 - Piping layout to be modified to accommodate new program layout.
 - HVAC work
 - Building will remain unheated and uncooled due to the fact the building will remain uninsulated.

- Exhaust fans serving washrooms/service spaces to be replaced with new exhaust fans complete with variable speed and occupancy sensors for power savings if practicable. Fans to be re-sized for new program layout.
- Ductwork layout to be modified to accommodate new program layout
- Fire Protection
 - Building will remain un-sprinklered.
 - Fire extinguishers to be provided to accommodate new program layout.
- Electrical work
 - Full replacement of electrical systems, electrical service to remain.
 - Two (2) to four (4) electrical panels, wiring, new lighting, and lighting controls, exit signage, outlets.
- PROS:
 - Washroom facility is provided for site visitors.
 - Fulfills recreational needs (e.g., Community Garden use, sports equipment storage, bike rentals usage, indoor program space.
 - Low operational costs (no heating or cooling costs, ventilation and DHW production only).
- CONS:
 - Moderate to high capital cost.
 - Building can only be occupied for 3 seasons (no heating, code minimum heating cannot be maintained).
 - No change to risk of loitering and vandalism.

Option 3: Full demolition and re-build with a smaller building footprint – Estimated Cost \$650,250

- Landscape work
 - Landscape related works shall be covered in the amenity design and detailing.
- Architectural work (Demo of this building - and rebuild a new 40 m² washroom/storage building.
 - With this option, and assuming the small building is primarily a public washroom with an associated service room and storage room we feel this could be treated as a sculptural block much in the same way the dedication stones exist in the park, a larger sculptural form could meet the simple program needs of this solution.
- Mechanical work
 - Plumbing work
 - New commercial grade, low-flow fixtures will be installed based on the new building layout.
 - New high efficiency (96% efficient), gas-fired, condensing water heater system to be installed, instantaneous heater if practicable, sized for new building layout.
 - Piping to be installed to accommodate new building layout.
 - HVAC work
 - The new building will be insulated therefore the new gas-fired heaters will be installed so that code minimum heating can be maintained. No cooling will be provided to reduce capital and operational costs.
 - New exhaust fans shall be installed to provide code minimum ventilation rates in washrooms and service spaces according to new building layout. The exhaust fans shall be complete with variable speed motors and occupancy sensors for power savings if practicable.

- Ductwork to be installed to accommodate new building layout.
- Fire Protection
 - The new building will not be sprinklered.
 - Fire extinguishers will be installed to accommodate new building layout.
- Electrical work
 - Demo all electrical systems, servicing, meter, disconnect. All the way to transformer. New Service
 - Two (2) to four (4) electrical panels, wiring, new lighting, and lighting controls, exit signage, outlets.
 - Electrical underground duct, new connection feed. Utility connection.
 - Misc./demo.
- PROS:
 - Washroom facility is provided for site visitors.
 - Lower capital cost (low demolition costs and low costs associated with new smaller building).
- CONS:
 - Higher operational costs (costs associated with code minimum heating, ventilation, and DHW production only).

Option 4: Full demolition with no re-build. – Estimated Cost \$210,000

- Landscape work
 - Landscape related works shall be covered in the amenity design and detailing.
- Architectural work
 - Architecturally there'd be no input but rather this option would be solely driven by budget and program (or lack of either) Demo existing building.
- Mechanical work
 - Demolish all mechanical services.
- Electrical work
 - Demo all electrical systems, servicing, meter, disconnect. All the way to transformer. New service. Terminate at power pedestal.
 - Two (2) to four (4) electrical panels, wiring, new lighting, and lighting controls, exit signage, outlets.
 - Electrical underground duct, new connection feed.
 - Utility connection.
 - Misc./demo.
 - Power pedestal.
- PROS:
 - Low capital cost (only demolition costs).
 - Low operational costs (no operational costs).
 - No risk of vandalism and loitering.
- CONS:
 - No washrooms facility is provided for site visitors.
 - No storage areas to fulfill recreational needs.