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GWAL
Goodkey Weedmark & Associates Ltd.

2785 8th Line Rd. - Larry Robinson Arena (Metcalfe Community Centre) Expansion
RFP No. 24423-90672-P01

Preliminary Mechanical and Electrical Concept Design Brief

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1.0 INTRODUCTION

This report is prepared for N45 Architecture Inc. The material in it reflects Goodkey, Weedmark & Associates Ltd.'s (GWAL) best judgement in light of information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it are the responsibilities of such third parties. GWAL accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The following description of the proposed mechanical and electrical systems will provide terms of reference for design development and completion of this project.

The following Codes and Standards will be adhered to for design development:

.1 Ontario Building Code, the latest edition.
.2 Ontario Electrical Safety Code, the latest edition.
.3 N.F.P.A. Standards.
.4 ASHRAE Guidelines.
.5 Model National Energy Code for Buildings.
.6 IESNA Guidelines.
.7 Applicable CAN/ULC Standards, the latest issuances.
.8 LEED v4/v4.1 including ASHRAE 62.1

2.0 MECHANICAL

2.1 FIRE PROTECTION

.1 Fire extinguishers shall be provided in accordance with the Ontario Building Code (OBC) and in high hazard areas.

2.2 PLUMBING

.1 Extend new water piping to new fixtures. Provide new sanitary to relocated septic bed location and connect to existing fixtures.

.2 Plumbing fixtures shall meet CSA & OBC requirements and shall be barrier-free where required.

.1 Public Washroom:
- Water closets – low flow, wall mounted manual flush valve type.
- Urinal – wall hung, flush valve type c/w automatic flush valve.
- Lavatory – counter mounted porcelain c/w automatic tempered water faucet.

.2 Change Rooms:
- Water closets – low flow, wall mounted manual flush valve type.
- Lavatory – wall mounted porcelain c/w manual mixing valve faucet.
- Shower – low flow, vandal proof showerhead c/w manual mixing valve.

.3 Design will include low flow/flush fixtures to accommodate LEED indoor water use reduction requirements. This will require coordination between the LEED Consultant and Mechanical Engineer. Watersense fixtures are to be considered for the new fixtures. However, according to CaGBC Technical Bulletin, existing plumbing fixtures are not required to be WaterSense labelled to meet the requirements of the prerequisite, but they still must be included in the Indoor Water Use Reduction calculations with their flush and flow rates.

.4 Natural gas piping shall be extended from the existing gas meter to new heating and domestic water appliances in the new addition.

.5 Permanently installed water meter shall be installed to meet LEED requirements for facility water metering.

.6 Domestic hot water for the new addition shall be provided by a new gas-fired condensing hot water heater with storage tank. Domestic water for the showers and lavatories shall be tempered to 120˚F (adjustable) via a master thermostatic mixing valve. New hot water tank shall be sized to meet the increased demand of added change rooms.

2.3 HVAC

.1 The exhaust and make-up air for the ground floor change rooms shall be provided by an energy recovery make-up air unit (MAU). The MAU shall consist of supply and exhaust fans, energy recovery enthalpy wheel, filters and gas-fired heat exchangers, DX cooling and hot gas re-heat coil. The DX cooling section shall be sized for dehumidification of change rooms during a summer design day. Supply and exhaust ductwork will be extended to each ground floor change room and the adjacent corridors for air distribution.

.2 The new public washrooms and janitors' rooms shall have a new dedicated exhaust fan.

.3 The new entrance vestibule shall be heated by electric force flow units.

.4 ASHRAE 62.1 for LEED IAQ Performance. As described in the CaGBC's requirements in the released technical bulletin in August 2023 for similar scope projects: to comply with the minimum IAQ prerequisite, the entire building must meet the prerequisite ventilation requirements, including both renovated and the unrenovated ventilation systems that will be retained. Additionally, all existing and new ventilation systems must meet the applicable monitoring requirement.

.5 MERV 13 filter to be provided for all outdoor air supply as part of Enhanced Indoor Air Quality LEED credit.

2.4 CONTROLS

.1 All controls shall be standalone programmable type and provided with controller to City of Ottawa BEEM standards.

2.5 ENERGY MODELING

.1 LEED Prerequisite Minimum Energy Performance - follow LEED direction for handling existing systems and equipment that are not being modified within the project scope; some of these are not required to comply with the mandatory requirements of ASHRAE 90.1-2010 for EAp Minimum Energy Performance, but still must be included in the energy performance documentation for Option 1 Whole Building Energy Simulation and modelled based on the existing conditions.

3.0 ELECTRICAL

3.1 POWER DISTRIBUTION

There are two (2) separate incoming Hydro services existing at the facility, a 600V service and a 120/208V service. Both services are fed overhead from an existing utility pole adjacent to 8th Line Road. The overhead lines run through the parking lot along the north side of the building to two (2) utility poles near the north-east corner of the building, then enter the building through the north wall. The overhead lines running through the parking lot will interfere with the proposed building addition.

The two (2) separate services do not meet Hydro One's current standards and requirements. When we relocate the incoming service, we will be required to upgrade to a single 600V service. The existing overhead lines and utility poles at the north-east building corner will be removed. The new service will be underground instead of overhead. The utility pole adjacent 8th Line Road as well as the pole across the street will be shifted in order to improve alignment of the remaining overhead wires. A new buried primary feeder will run from the pole adjacent to 8th Line Road, through the revised parking lot, to a new pad mounted transformer where the existing sea can is located behind the building at the north-east corner. A new secondary feeder will run underground from the new transformer into the existing main 600V electrical room.

There is an existing residence located behind the tennis courts currently fed overhead from one (1) of the poles at the north-east building corner. Hydro One will re-feed this residence from another location in order to allow the removal of the existing poles.

In the main 600V electrical room, the existing main disconnect switch will be upgraded to suit the new larger 600V service. A new indoor transformer will be required to re-feed the existing 120/208V distribution. A new 120/208V panel will likely be required to feed the building addition. This work will likely require some additional space in the service spaces under the bleachers.

3.2 BRANCH CIRCUITS

Rigid PVC conduits or Coreflex will be used for conduits embedded in the slab.

Wiring devices will be specification grade c/w brushed stainless steel cover plates and adhesive circuit labels, installed at barrier-free mounting heights. Ground fault circuit interrupter type receptacles will be provided outdoors and adjacent to sinks.

Open floor areas and corridors will be provided with general purpose house keeping receptacles located approximately every 10m. Weatherproof receptacles will be provided outdoors at each entry/exit.

All branch circuitry, including receptacles, will be concealed or embedded in the slab where finishes so dictate. Exposed conduit installations will run perpendicular or parallel to building lines.

All conduit systems used for power distribution will feature a continuous grounding conductor.

All feeders shall be wired in conduit. Armoured (Bx) wiring shall be permitted within metal stud partitions and for fixture drops with a maximum length of 3m.

All wiring will be copper with 1,000V insulation for feeders and 600V insulation for branch circuits. Flexible conduit shall be used for connections to transformers and motors.

Two (2) 208V, 1-phase dedicated circuits will be provided in the parking area for future Level 2 EV charging stations.

3.3 EMERGENCY LIGHTING

Emergency lighting will be provided using 12V DC emergency battery units (EBU's). Remote emergency lighting heads will be strategically located along egress routes and throughout the building in accordance with OBC requirements. The battery units will be located in electrical/mechanical service rooms and/or storage/equipment rooms.

The emergency battery units shall provide continuous power supply for a minimum of 30 minutes.

3.4 EXIT SIGNAGE

New exit signage will be installed to define egress paths throughout the addition. The signs will be 'running man' style, using an LED source, connected to normal power lighting circuits and emergency battery units. Internal illumination shall not exceed 200 cd/m² (nits) during nighttime hours and 2000 cd/m² (nits) during daytime hours in accordance with LEED v4/v4.1 requirements.

All existing exit signs throughout the facility will be replaced with new 'running man' style.

3.5 LIGHTING

General lighting throughout the addition will be provided by LED strip fixtures with frosted acrylic lenses, either surface mounted or suspended depending on the location. Vapourproof LED fixtures will be used in the shower areas. Local lighting controls will be provided throughout with occupancy sensors.

Exterior lighting on the facade of the building will be full cut-off LED luminaires in accordance with LEED v4/v4.1 requirements. New pole mounted LED fixtures will be provided to light the reconfigured parking lot. As the existing pole mounted fixtures are not in appropriate locations and are not LED. Light fixture locations and lighting levels will address safety requirements and wayfinding around accessible parking areas. Existing controls will be reused for exterior lighting. Photometric analysis will be provided for lighting pollution reduction and to ensure light spillage over the property line is avoided.

3.6 FIRE ALARM SYSTEM

The existing fire alarm system will be extended into the new addition and a new booster panel will be provided as required. New alarm and initiating devices will be installed as required. Alarm signals will provide minimum 65 dBA sound level throughout the addition. Visual alarm devices will be provided as required.

New fire alarm pull stations will be installed at all exit doors in accordance with Accessibility Standards CSA B651.

Testing and verification (conforming to CAN/ULC-S537 Standard) will be conducted.

3.7 COMMUNICATIONS SYSTEMS

The communications system provisions will include an empty conduit system for IT/Phone cabling. Client input will be required in terms of backbone connections between the existing building and proposed addition.

Combination data/voice outlets c/w 21 mm (3/4") EMT, 2-gang boxes, and plaster rings will be provided at Client requested locations.

Cable TV outlets will be provided c/w 21 mm (3/4") EMT conduit drops with pull string as directed by the Client.

All empty conduits will include pull strings.

3.8 MECHANICAL EQUIPMENT CONNECTIONS

Electrical motors below 1/2 HP will be powered from 120V circuits; larger motors will be connected to a 600V source.

New mechanical equipment provisions will include connections to HVAC and plumbing equipment.

New motor starters or VFDs will be employed to control motor loads in the building.

Fractional horsepower fans will be controlled by local manual motor starters.

3.9 SECURITY ACCESS CONTROLS SYSTEM

The security and access control system will include an empty conduit raceway system and power for control panels. The layout will be as directed by the Client.