



# Toronto Transit Commission Duncan Shop Ventilation Upgrade

## CLIENT

Toronto Transit Commission

## LOCATION

Toronto, Ontario

## Project Description

The Toronto Transit Commission (TTC) is Canada's largest urban transit system with more than 521 million riders per year, operating more than 250 million kilometres of service. The system provides 85 per cent of the transit trips in the Greater Toronto Area. It operates 24/7, moving nearly 1.8 million riders per day. In 2019 the TTC celebrated its 32<sup>nd</sup> billionth passenger in its nearly 100 year history.

The project demanded the modernization of the ventilation systems to comply with current codes, and TTC standards for indoor ventilation capacity and air balance throughout the four areas of the Duncan Shop. It included rooftop ventilation units, bus tail pipe exhaust systems, miscellaneous exhaust air systems, unit heaters, air conditioning units, new boilers and electrical power, HVAC controls, ductworks, building services' piping, and testing and commissioning services.

## B&M Scope of Work

Black & McDonald was the general contractor providing labour, equipment and materials for installation, testing and commissioning of all systems as well as management of trades below:

### Architectural

- Provide guards at roof perimeter
- Construct cross-over stairs on roof level to navigate over mechanical services
- Provide precast and composite paver walkways at roof level
- Patch/repair roof openings created from existing HVAC equipment removal
- Modify existing roof openings for new mechanical equipment
- Remove spray fireproofing from existing OWSJs that require reinforcement work
- Apply of new spray fireproofing to modified OWSJs and new roof decking patches
- Provide new fire-rated drywall enclosure around boiler flue

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## Structural

- Verify dimensions, elevations, size and configuration of existing structures
- Design and provide temporary bracing and shoring as required to protect existing structures and services
- Reinforce open web steel joists and supporting beams
- Provide mechanical equipment platforms, curbs, hangers and hanger support
- Reinforce roof deck at locations of new roof openings to suit equipment supplied and duct installation

## Mechanical

- Temporary support and/or permanent relocation of existing services to facilitate OWSJ reinforcement Work (domestic water, compressed air, sprinkler and rainwater services)
- Provide sprinkler system revisions and all associated services
- Provide plumbing and all associated services
- Provide gas piping and all associated services
- Demolish existing mechanical services as required to facilitate installation of the new roof top make-up air units, A/C units, fans, boilers and accessories
- Off-loading and placement of equipment
- Field start-up and test
- Provide, commission, and certify new boilers and ventilation system
- Test, adjust and balance related to the ventilation and mechanical systems

## Electrical

- Provide panelboards, starters, transformer, breakers and disconnects
- Provide busways, raceways, power cables and power and control conduits
- Wiring and termination of all electrical and mechanical equipment
- Demolition and modification to existing electrical systems affected by new work
- Local relocation of existing light fixtures where needed to avoid new services
- Provide building automation and control system including associated electrical work
- Modifications to existing fire alarm system to accommodate sprinkler zone 2A and 2

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## Key Challenges and Solutions

- Fully operational unionized vehicle and bus maintenance facility in busy core downtown Toronto location
- Staged construction work areas in busy and congested multiple building TTC facility
- Detailed planning and scheduling with all stakeholders
- Adjacent residential neighbourhood and local noise by-laws
- Seasonal work restrictions and staging of HVAC upgrades

## Benefits to Client or Problem(s) Solved

When Canada's largest transit system needed modernization of one of its critical maintenance facilities in Toronto's busy downtown core, the TTC called on Black & McDonald. The knowledge and expertise of its professionals was essential in managing the complex challenges of the project. By extension, the upgrade of the ventilation system of this key facility kept much of its vehicle and bus fleets operating to serve Torontonians.