

ETS Centennial Garage Fact Sheet

The ETS Centennial garage is the largest garage in the Edmonton Transit system; over 300,000 square feet and comfortably housing 250 buses plus space for cleaning, servicing and maintenance.

It has a number of advanced features that provide a safe productive workplace for Edmonton Transit and Fleet Services employees while at the same time saving energy and promoting the City of Edmonton's commitment to environmental responsibility.

Mechanical Room

Boilers:

6 – Camus Dynaflame natural gas boilers delivering heat to all areas of the building. Low NOX emissions and 88% efficiency.

Domestic Hot Water Heaters:

2 – AO Smith Cyclone XHE heaters. 94% efficiency. 647 litres per hour recovery. 378 litre storage tank.

Pressure Wash Heaters:

3 - Rinnai natural gas temperature controlled continuous flow heaters

Humidification Boiler:

Dalton Energy Packaged system supplying 243 Kg per hour output complete with water softener and controls.

Maintenance Area

Hoists:

In-floor Hoist for 40 foot straight and 60 foot articulated buses

Make: Stertil Koni USA

Quantity: 14

Type: 2 or 3 Telescoping Pistons with power wheelbase adjustment

Capacity: 15,876 Kg per piston

Controls: Remote wired from pendant

Safety features: Safety leg - Automatic leveling

Platform Hoist for Community Service buses

Make: Stertil Koni

Capacity: 25,000 Lbs

Four piston scissor style leveling mechanism

Controls: Remote wired from pendant

Safety features: Safety leg

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Fall Protection:

Provided in 2 mechanical bays and 2 autobody bays -

Vehicle Exhaust Collection System

Quantity: 22 exhaust intakes split between 4 fan systems

Size: 225mm diameter

Air flow per exhaust 375 l/s including aux heater exhaust. Total tailpipe exhaust is 8,300 l/s

Auxiliary Heater exhaust collection system:

Quantity: 20 intakes associated with tailpipe exhaust

Size: 100mm diameter

General Ventilation:

Maintenance area also has 4 ventilation units for general exhaust totaling 37,000 l/s

Lubricant Reels:

Quantity 54

Products delivered -

Engine Oil - 2499L tank,

Transmission Fluid - 2499L tank,

Anti-Freeze - 2499L tank,

Engine Coolant Treatment - Drum,

Windshield Washer Fluid - 2499L tank,

Grease - Drum

Over 1.9km of lube piping. All carbon steel tubing is bent to avoid potential points of failure and to reduce costs.

Bus Storage Area Heating and Ventilation System

Concept: Low turbulence cross flow ventilation with fresh air introduced at floor level and exhaust drawn from ceiling area. Low turbulence reduces mixing of fumes at ceiling level for fresher air at floor level.

Air flow direction is away from occupied areas and in the direction of bus travel through the garage.

Air enters the building through large perforated screens to reduce turbulence. In-floor heating eliminates the turbulence that would have been created by ceiling mounted unit heaters.

Number of supply air units: 16 for storage area, 2 for entry lane, 1 for wash lane, 1 for re-fuelling lane

Maximum supply air: 188,000 l/s all outdoor air

Number of exhaust units: 21 for storage area, 2 for entry lane, 2 for wash bay, 2 for re-fuelling

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Maximum exhaust: 190,000 l/s

Air changes per hour: 5.4 up to the 6 meter level

Capacity of in-floor heating system: 10,270,000 BTUH

Fueling Lanes

Storage Tanks:

2 @ 90,000 li capacity

Tanks are double walled with leak detection between the walls, ULC approved, and installed as per the Alberta Fire Code.

Each tank has 2 - variable speed submersible turbine pumps rated at 300 l/minute.

Tank monitoring system:

Veeder Root 350R provides inventory reconciliation and leak detection.

Pipes from tanks to building are also double wall with leak detection.

Dispensers: 2 high flow (83 l/m) cam-lock bus dispensers and 2 conventional flow (45 l/m) dispensers.

AIM 2 system records fuel dispensed to each bus and captures odometer readings.

Ventilation system in fuel lanes is activated by ultrasonic vehicle detection system.

Re-fuelling area can also dispense windshield washer fluid, antifreeze, cleaning fluid and domestic water.

Vacuum System

The system is comprised of a vacuum pump, pre-separator with refuse container, bag filter separator, two remote controlled hose reels, chemical dispensing centre, automatic vacuum shut off air valves, piping and programmable logic controller type electrical system with pump soft start motor starter.

The two hose reel stations each have 50 ft x 1-1/2 inch vacuum hose with hot water dispensing system, floor and seat cleaning tools with solution applicator integrated into tool handles. Central hot water/cleaning compound dispensing system, which includes a heater (up to 140 degrees F.), pump, hydrominder for automatically mixing the water and cleaning compound concentrate to a desired dilution level.

A wireless remote control unit is mounted high on the cleaning lance to control the 'In and Out' of the hose from the reel.

Vacuum Pumps:

20 HP motor providing 570 SCFM air flow with 110 inches of water gauge suction

Maximum sound level: 84 dbA at 10 feet

Pre-separator: Dumpster capacity: 30 gallon

Filter unit: 40 square ft, 99.9% efficient at 1 micron

Hose reels: 4 @ 1.5 inch diameter, 50 feet long

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Wash Rack System:

InterClean Equipment Inc. - Hybrid Bus Wash System with Water Recycling.

Soap arch: flow 300 GPM, pressure - 300 PSI

Under bus wash: flow - 30 GPM, pressure - 300 PSI

Wheel wash: flow - 50 GPM, pressure - 300 PSI

Brushes: RPM - 120 RPM, flow - N/A, pressure - N/A

Rinse arch: Flow - 30 GPM, Pressure - 60 PSI

Sump system: Capacity 80,000 Litres

Recycle features - See attached InterClean Water Recclamation information.

Wash system control features - Windows PC Touchscreen Controller.

Safety features - standard emergency stop mechanisms and system time-outs for disabled vehicles.

Water Recycling System:

The InterClean Hybrid Transit Bus Wash System with Water Recycling utilizing high pressure, touchless cleaning for the front, top and rear of the bus and soft, polycarbonate brushes for the sides, uses a total of 570 litres of water with only approximately 80 litres being fresh water. The system recycles roughly 80% of the water.

The InterClean system is based on gravity separation and passive, non-mechanical primary treatment techniques. The settling pit is designed to accommodate all of the process wash water and allow for a designed retention time. The pit is baffled near the suction end (clean end) to further isolate settled particles and capture floating oils and debris. Water drawn from the pit through InterScreen is then pumped through a cyclonic separator that will separate 96% of all solids heavier than water. The cleaned water flow from the cyclonic separator is directed into a 550-gallon cone-bottom tank that is designed to act as a secondary cyclonic separator further reducing solids in the water. The system has the ability to add enzymes, bacteria and nutrients to the recycled water. This Enhanced Biological Water Treatment System reduces oils, greases, and other organic waste loading in the recycled water. This procedure is the same as many municipal wastewater treatment plants.

Edmonton transit is estimated to save roughly 14 million litres of fresh drinking water per year based on their annual washing demands at this one site using two InterClean Hybrid Bus Wash Systems.

Main Entrance and Underbody Wash

High Speed Doors:

Construction: Rubber

Supplier: TNR Industries

Open time: 7.5 seconds

Safety features: Thru-beam photoeye, Reversing edge

Controls: NEMA 4 control box with programmable controller.

Door opener: Under floor loop, and switch at Booker shack

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Underbody wash system:

Flow: 3 pump modules each rated at 6.62 l/s of water.

Pressure: 6900 kPa (1000 psi)

Pump modules serve entrance area as well as the undercarriage wash in the wash lane.

Wheel wash system:

Part of the undercarriage wash system using nozzles on spinners directed at the wheels.

Communication system with booker:

2 way voice intercom between bus drivers at bus entrances with Booker over TCP/IP networks, integrated with the base building LAN infrastructure. Capable to forward calls to additional PC's. Intercom is initiated by a buried loop detector. Communication is hands-free at remote stations.

Solar Wall:

The solar wall consists of a perforated metal cladding placed in front of an insulated wall to create a space for capturing solar heat gain, is incorporated into the front, south-facing facade. The solar wall delivers between 3600-6600 cubic feet per minute (cfm) of preheated ventilation air to the interior space via large ducts placed at the upperpart of the wall. The wall was employed to reduce consumption of fossil fuels used for heating.

Natural Ventilation:

Operable windows are placed above the main drive aisles and east wall of maintenance areas to provide supplementary ventilation. Motors installed at each awning window facilitate remote operation.

Lighting

Energy efficient lamps and ballasts technology:

Energy conservation through central computer based control of addressable dimming ballasts, localized control of non-addressable dimming ballasts, and localized switching or dimming by daylight sensors and/or occupancy sensors.

Energy efficient luminaires. For office and administrative spaces; from the simple and efficient linear fluorescent troffer, to direct/indirect linear fluorescent luminaires suspended from the ceiling in spaces emphasizing ambient and glare control. For garages and service areas; from linear fluorescent task lighting to high-bay linear fluorescents applications in areas with high ceilings. These luminaires in general either use the 32 watts T8 lamps or the 54 watts T5HO lamps, selected to achieve the optimum balance of efficiency and light distribution. The high bay areas utilize multi-level switching (33%, 66% and 100%) of luminaires in accordance with the availability of day light. As well, programmable network lighting control systems to suit users operational activities.

