

# **GENERAL BID SPECIFICATIONS FOR A 4 CYLINDER LPG (Propane) OR GASOLINE POWERED 65 INCH (165 cm) to 77 INCH (195 cm) RIDER SWEEPER**

**INTENT:** The intent of this specification is to describe an engine powered rider machine capable of sweeping inside or outside areas for manufacturing facilities, warehousing, parking garages, surface lots, block and brick facilities and other similar applications. Machine must capture and transport swept debris and be capable of dumping debris at ground level or into a dumpster. Machine must incorporate a dust control system to prevent fugitive dust emissions and be capable of controlling dust across the entire sweeping path, including the side brooms.

In order to reduce labor and operating costs and to ensure proper safety, the capacities of this machine are very important. All exceptions to the specifications must be clearly identified and submitted in writing on a separate sheet of paper marked "EXCEPTIONS". Bidders who fail to submit their exceptions will not be considered.

## ***SWEEPING SYSTEM:***

A direct throw mechanical broom sweep system is required for maximum performance.

## ***CLEANING PATH:***

- A minimum cleaning path of 65 inches (165 cm) is required for single side broom configuration.
- Sweeper must have the option of a second side broom that increases the sweeping path to 77 inches (195 cm).
- A minimum of 77% of the sweep path for a single side broom configuration or a minimum of 65% for a dual side broom configuration must be cleaned by the main broom system which cleans more aggressively than the side brooms.

## ***MAIN BROOM:***

- Since the main broom provides the most aggressive cleaning for a sweeper, a minimum 50 inches (127 cm) wide main broom is required.
- The main broom must be able to be removed from the machine easily and without tools to minimize maintenance and downtime.
- Main broom door must open 170 degrees to provide easy access to remove the broom.
- A swing out arm must hold the main broom in place and easily swing out, but remain connected to the machine for access to the main broom – a separate retainer block system to hold the main broom in place, which can get separated from the machine, is not acceptable.
- A mechanical lever must lower the main broom into the sweep position and raise it back up to the transport position.
- To extend broom life, reduce broom polish marks on the surface, and increase safety, when the main broom is in the lowered position it must not be engaged when the machine is stopped and it must automatically engage when the machine is in motion.
- All brooms must stop automatically when foot pedal is moved to neutral.
- Main broom must be spun balanced for smooth operation and high performance.
- Main broom must be reversible to prevent bristle set.
- Main broom design must include a recirculation flap to minimize missed debris during sweeping.

- Main broom must have two operational settings, constrained sweeping position for typical sweeping and full float position for more complete sweeping of uneven surfaces.
- Adjustment for broom wear must be completed from the operator's seat.
- Adjustment system must include a visual indication of broom wear.

### ***SIDE BROOM:***

- A rotary, disposable type, with molded brush block 26 inches (66 cm) diameter right side broom is required.
- Side broom is to be lowered automatically when main broom lever is moved to the sweeping position and must also raise up when the main broom lever is moved to the raised/transport position.
- Side broom is to stop when the foot pedal is moved to the neutral position, this increases safety, reduces broom polishing marks on surfaces, reduces broom wear and thus reduces the overall cost of ownership.
- Side broom can be independently raised and shut off with the push of a button.
- Standard bristle type is Polypropylene with other options available.
- Side broom assembly retracts upon impact during operation for protection to broom and drive motor.
- Side broom must float over uneven surfaces and have adjustments for wear.
- Broom wear indicator shows broom wear.
- No tools are required to change the broom or adjust the broom height.
- Optional side broom speed control from operator compartment must be available.
- Optional left hand side broom must be available.

### ***POWER SOURCE:***

- Engine must be a dedicated industrial design with enclosed gear driven valve train – engines with timing belts and chains are not acceptable.
- Engine must be manufactured by a supplier with globally recognized service, support and reliability.
- Must have a fully enclosed 4 cylinder engine; 1.6 liter, liquid cooled industrial engine, LPG: 55 hp (41.0 kW) or Gasoline: 57 hp (42.5 kW).
- Engine must be:
  - EPA Non-Road LSI Tier 2 Certified, and
  - CARB Off-Road LSI Tier 3 Certified.
- Engine block must be common across all fuel types available on sweeper platform (LPG, Gasoline and Diesel).
- Engine must return to idle from operational RPM after 40 seconds of machine inactivity to reduce emissions, noise and fuel consumption.
- Must include a heavy duty, two stage engine air cleaner with visual indication of filter clogging.
- To protect the engine an automatic low oil pressure and high coolant temperature shutdown system is required.
- An industrial 3 core radiator with cooling fin spacing of no less than 6 fins per inches is required.
- Hydraulic radiator must tip out 90 degrees to facilitate easy cleaning of engine radiator and hydraulic radiator.
- Engine and hydraulic system cooling air must be pulled from the side of the engine compartment; pulling cooling air from below the engine compartment is not acceptable.

- Full engine and hydraulic pump access must be easily provided by tip out rotomolded covers that can be tipped out without tools providing full engine and hydraulic system access on 5 of 6 sides of the engine.
- Engine starter must only engage when the motion pedal is in neutral position to prevent unexpected motion when starting machine for increased safety.
- LPG: Tank replacement must be fast and easy with tank location on machine at ergonomic lifting height no higher than 20 inches (51 cm).
- LPG: In case of emergency, the on/off valve on the LPG tank must be directly accessible from outside the machine. A full 33 pound LPG tank must provide up to 4 hours of continuous run time.
- Gasoline: External fuel cap must be available at the rear of machine for easy refueling. A full 11 gallon fuel tank must provide up to 7 hours of continuous run time.

### ***HYDRAULICS:***

- Unit propulsion, main broom, side broom, and dust control vacuum fan to be driven hydraulically.
- The engine is to furnish power through a coupling to a variable displacement piston-type hydraulic pump.
- Pump must provide infinitely variable propelling speeds within the governed range to a heavy duty rear wheel drive motor. Maximum speed must be at least 9 mph (14.5 kph).
- Transport speed must be limited when hopper raised to increase stability and safety.
- A tandem mounted gear-type hydraulic pump is required to send fluid to hydraulic motors driving the main and side brooms and vacuum fan.
- Hydraulic oil cooler is required to keep the fluid cool even in the harshest applications. For ease in cleaning, the Hydraulic cooler must tilt out 90 degrees.
- A case drain must be provided on the dust control vacuum motor and main broom motor to prevent motor damage.
- Standard 10W30 motor oil is to be utilized within the hydraulic system for easy field maintenance and availability and easy disposal of used oil.
- 100% of fluid is to be filtered in the hydraulic system.
- Operating functions controlled by sealed electronic solenoid cartridges are to be combined into a single manifold block.

### ***DEBRIS HOPPER:***

- Hopper safety prop-rod engagement must be possible from the operator seat position for easy use and safety. Manual engagement prop-rod bar requiring operator to get out of the seat to engage is not acceptable.
- Machine shall have a minimum volume capacity of 14 cubic feet (396 L), with a minimum weight capacity of 1,000 pounds. (545 kg).
- Hopper is to be constructed as follows for minimum maintenance: structural non-corrosive polyethylene roto-mold hopper with integrated bumper and side broom protection.
- Impact absorbing bumper system is required to protect the machine, operator and owner's facility.
- Heavy gage galvanized steel skid plate on bottom of hopper is required.
- Floating wear flaps are to be mounted around the main broom chamber to allow vertical movement for passing over objects up to 3.5 inches (9 cm) above floor level.

- Hopper must be equipped with a dump door to prevent loss of swept debris during transport and to allow debris to be raised to dump height without spilling.
- Hopper door must automatically close when the main broom is raised or when the hopper is raised to prevent accidental dumping at ground level.
- Hopper is to be hydraulically raised with dump height possible from ground level up to 60 inches (152 cm).
- When emptying hopper into a dumpster, the hopper must be able to be lowered to have the hopper door opening below the threshold of the dumpster by 4 inches (10 cm) to minimize dust while dumping.
- During dumping, the operator must be able to see around the right side of the hopper for safe visibility without leaning out of the machine.

### ***DUST CONTROL SYSTEM:***

- Machine must utilize a 5 stage dust control system that includes dust control at the side brooms.
- A panel filter which offers a minimum total filtering area of 94 square feet (8.176 m<sup>2</sup>) and controls dust particles down to less than one micron in size is required.
- A high volume, hydraulically driven, 9 inches (23 cm) vacuum fan is required to provide excellent main broom dust control. Exhaust air is to be channeled through the chassis and out the rear of the machine.
- Dust must be locked in the hopper area by a dust panel filter located in the hopper; it is not acceptable to route dust laden, unfiltered air out of the hopper area.
- The filter system must empty filtered debris directly back into the hopper without passing through seals.
- All critical dust control system seals must be replaced when the dust filter is replaced to maintain the dust control system. The panel filter must be able to be replaced in less than 1 minute without tools and from an ergonomic lift height.
- Panel filter is to be cleaned utilizing a vibratory style filter shaker which automatically operates for a timed sequence and covers a wide spectrum of vibration frequencies by cycling on and off.
- Filter cleaning cycle must execute either by the operator pressing the filter cleaning button in the operator compartment or each time the main broom lever is moved to the raised position.
- A metal panel in the hopper beneath the dust filter is required to protect the filter and to capture the shaken dust and automatically dump it when the hopper is raised.
- The vacuum fan must automatically turn off when the shaker motor is activated to prevent dust particles from being imbedded more deeply into the filter.
- No dust separation system that requires disassembly with tools for cleaning and maintenance is allowed.
- Dust control system must have optionally available side broom dust suppression system using a fine water mist to knock down the majority of side broom generated dust; a shroud system that blocks the operator's view of the side broom, pushes debris to the side of the sweep path and is vulnerable to damage is not acceptable.

## ***OPERATOR COMPARTMENT:***

- Compartment shall be equipped with
  - An adjustable operator seat with enough leg room to comfortably accommodate a 6 foot 6 inch person.
  - A single foot pedal that is adjustable for comfort which controls forward, reverse and travel speed.
  - Mechanical foot brake used to stop the machine.
  - A foot operated parking brake is required which will keep the machine from moving while it is unattended or parked on an incline.
- Operator compartment must not contain sharp edges that can contact an operator's knees when getting in and out of the machine.
- Operator compartment must have a roto-molded design for easy water wash down.

## ***CONTROLS:***

- For safety and comfort, the operator must be able to have clear sight lines of the edge of the right side broom without leaning outside the machine compartment.
- Tactile and LED feedback touchpad controls with buttons large enough to be operated with gloves on are utilized with functions symbolically ordered in logical color coded groups.
- A single main broom handle controls the automated one touch sweeping system for easy training and machine operation.
- Activating sweep system with the sweep system lever must do all of the following:
  - Lower main broom
  - Lower side broom
  - Open hopper door
  - Activate dust control system
- All sweep and dust control functions, once activated, must start and stop with machine motion for safety and to reduce broom wear reducing the cost of ownership.
- Operator area must include as standard:
  - Key switch
  - Oil pressure and water temperature lights
  - Dust control switch (wet sweep bypass)
  - Main broom and side broom controls
  - Hopper raise/lower controls
  - Hour meter
  - Electronic timed filter shaker switch
  - Horn
  - Headlights
- Optional gage system that provides engine temperature, oil pressure, voltage and fuel level must be available.
- All electronics are to be circuit breaker protected.
- Automotive style sealed connectors are to be utilized throughout the wiring harness for increased reliability.
- Electronic control board is to be enclosed in a roto-molded water resistant compartment.

### ***STEERING SYSTEMS:***

- Full power steering is required with single rear wheel steering.
- A 15 inch (38 cm) diameter steering wheel is required.
- The machine rear tire must be capable of turning 90 degrees to minimize the space required for a U-turn to 109 inches (227 cm) maximum.

### ***TIRES:***

- Front tires shall be 21 inch diameter (53 cm) pneumatic 10 ply allowing the unit to comfortably negotiate improved and unimproved surfaces without excessive shock being transferred to the operator.
- Rear tire shall be 18 inch diameter (46 cm) pneumatic 8 ply.
- Ability to cross railroad tracks and speed bumps without damage to unit required.
- Solid tire options must be available.

### ***CORROSION RESISTANCE:***

- Exterior of machine must be roto-molded to minimize the risk of rust on exposed metal.
- Frame must be powder coated to provide extra corrosion and scratch resistance.
- Exposed fasteners shall be corrosion resistant.

### ***SERVICE:***

- Tip out and lift off covers for easy service access are required.
- For safety, covers must interlock so engine is not accessible when the operator is on the seat.
- With covers open the engine must be fully accessible on 5 of 6 sides.
- Machine must be power-washer safe for easy cleaning.
- Electronic diagnostics with fault code history is required.
- Complete parts and service manual with quick trouble shooting guide is required and must be available on-line.

***OVERALL DIMENSIONS:*** Machine overall width shall be no more than 64 inches (163 cm) wide for ease of maneuverability with a maximum length of 94 inches (239 cm).

***WARRANTY:*** Minimum 6 months labor, 6 months travel, 4 years/2,800 hours parts, 8 years roto-molded components.

***APPROVALS:*** Shall have certification from ETL and CE and clearly displayed labels showing as such.

***LABOR, PARTS & SERVICE:*** Local parts and factory trained technicians must be available.

## **WHERE REQUIRED:**

### ***SIDE BROOM DUST SUPPRESSION:***

A water fog is required which is dispensed from a 14 gal (53 L) integrated tank through nozzles directed at the side brooms to suppress dust generated by the side brooms. Nozzles are to have no tool twist off caps with built in filter and check valve for easy maintenance. Water mist system is to be controlled on and off automatically with side broom operation. Side broom dust suppression must be provided to allow for a fully dust controlled sweep path for maximum productivity with minimum fugitive dust emissions.

### ***ALL WEATHER CAB ASSEMBLY:***

Protects the operator from elements and includes as standard: windshield wiper, blower fan and windows on both the left and right side that open for ventilation. Cab must meet a 79 inch (201 cm) clearance height. To safely and comfortably view side sweeping broom (and eliminate the need for the operator to open and extend head outside of the cab), unit will be equipped with a dedicated side sweeping broom window located next to the operator's right knee.

### ***LITTER VACUUM SYSTEM:***

12 foot long hose with 4 inch diameter must be capable of capturing debris with enough vacuum power to capture a golf ball sized rock.

### ***OVERHEAD GUARD SYSTEM:***

Must meet ANSI/ITSDF B56.1 and ISO 6055 Falling Object Protection (FOPs) requirements.