The Exhaust Removal System shall be 100% re-circulating, fully automatic, ceiling hung filtration system that addresses the problem of diesel/gas fumes in the Fire station and does not interfere with normal day-to-day operations or vehicles. The system must be designed to evacuate diesel/gas fumes through a filtration system and re-circulation of filtered air into the bay area without exhausting contaminants to the outdoor environment. The system shall not affect the personnel boarding the apparatus. The exhaust system shall not impede doorways, exits, vehicles and may not consist of any form of direct vehicle attachment.

**TECHNICAL SPECIFICATIONS:**

**1.0 GENERAL:**
The air filtration unit(s) and activation systems shall work together to control, and/or reduce the vehicle exhaust produced by apparatus, in addition to contaminants generated from other sources. There are multiple sources of apparatus bay contamination consisting of airborne engine vapors, apparatus leaking seals, diesel and gas exhaust, soot, gases, carbon monoxide, nitrous dioxide, turn-out gear out gassing, power saw or other on board emergency gasoline or diesel powered equipment. The system must be capable of removing intermittent exhaust migration due to apparatus or other internal combustion equipment being run on the facility tarmac or apron. Additional toxins to be removed must include Volatile Organic Compounds (VOCs), particulates, and lung damaging dust.

**Comply with the above specifications? Yes__ No__**

**1.1 SYSTEM:**
The VEHICLE EXHAUST REMOVAL SYSTEM must be a totally "hands-free," automatic activated system to allow emergency personnel to respond to the emergency at hand. The system automatically activates: when apparatus egress and ingress the station, and through additional options as stated within these specifications. The vehicle system must incorporate a timer which shall be easily adjustable (See ACTIVATION)

The Timer Control Maintenance Monitor (TCMM or TCMMB) and the filtration units with all components in place as a system must be ETL (Electrical Testing Laboratories) approved to UL 507 Standards, with documentation provided with bid.

The timer control box must be 100% low voltage (24V max.), to eliminate shock hazards to personnel, with no high voltage incorporated in the controls. Electrical test data detailing the timer control low voltage status must be provided with the bid.

**Comply with the above specifications? Yes__ No__**
1.2 TEST DATA:
The system being bid must have documented evidence of having been successfully tested to meet regulatory health and safety standards in an active Fire/EMS department. The test must have been conducted by an independent testing organization within the auspices of an independent industrial hygienist. The test results must show, with regards to personnel health and safety, that the system meets and/or surpasses regulatory standards for ACGIH, NFPA, BOCA, ASHRAE, OSHA, PEL (short term), TLV/STEL, and NIOSH. Test parameters must include VOCs, NO\textsubscript{2}, SO\textsubscript{2}, CO, Particulates and Diesel Exhaust Particulates as one of the standards of measurement. The testing must have been performed by an Industrial Hygienist and must verify performance standards with fire apparatus idling in bays, on the tarmac, and entering/exiting bays as would occur during normal station operation.

**Comply with the above specifications? Yes__   No__**

1.3 EQUIPMENT:
The filtration system shall be delivered and installed as a turnkey project with no requirement for station personnel involvement. The system(s) shall consist of units incorporating a minimum 3000 CFM mfr. rated blower and motor. Blower/motor speed shall be the same as that used by the manufacturer for 3000 CFM. The system filtration media must be verified by the manufacturer to be capable of capturing vehicle exhaust incorporating a minimum 2700 CFM using only bid listed filters in place, meeting NFPA and OSHA Standards. A sufficient quantity of units must be included to provide a minimum of 8 air changes per hour based on the volume of the facility in question and the delivered filtered air from the quoted equipment. **Test data from an independent organization citing actual delivered air flow, with the all bid listed filters in place within the unit, must be included with Bid Package.**

There will be no heat/air loss or air exhausted to the outside atmosphere. The air filtration system's equipment must not require building structural modifications.

**Comply with the above specifications? Yes__   No__**

1.4 SAFETY:
Station personnel safety being a top priority, the air filtration system will include the following safety features:

- All components must be ETL approved.
- Filtration units must have an integral overload breaker switch to work in tandem with electrical panel breakers.
- All TCMM and TCMB control wiring shall be 100% low voltage (24VAC max) to eliminate electrical hazard.
- TCMM will house internal visible LED indicators for all ON units.
• All filters listed in the bid specifications for the Air Filtration Unit(s) must be placed in separate built in rigid tracks to ensure safe filter removal and replacement.
• Fan motor overload switch to prevent overheating.
• Surge protection against electrical spikes damaging controls provided.
• Both particulate filters' MERV rating based on ASHRAE standards must be listed and filtration manufacturer information included, to ensure safe levels of diesel particulate capture control.
• An installed CO/NO2 monitor wired to activate the filtration system.

Comply with the above specifications? Yes__ No__

1.5 FEATURES:
• Ceiling suspended design evenly distributing unit weight of no more than 300 lbs.
• Requires 208/230V 1 PH/60Hz power with no less than a 3000 CFM Mfr. rated blower driven by one (1) hp, double inlet, direct drive blower with permanently lubricated ball bearings.
• Utilize a horizontal or vertical pull-through design for optimum exhaust elimination.
• Relocation or re-positioning capabilities, not a permanent fixture type system.
• Compartment doors must provide swell latch handles, no bolts, to open on the door for safety in height access and expediency in filter replacement.
• Red LED filter change indicator to be visible from the floor level.
• Rear visible breaker switch light.
• Capable of 24/7 operation.
• Accommodate any size vehicle or vehicle arrangement.
• Accommodate any ceiling height and ceiling construction.

Comply with the above specifications? Yes__ No__

1.6 ACTIVATION:
All supplied air filtration unit(s) must work in tandem with and include an automatic, hands free, low voltage (24V) activation system featuring:
• Operation engineered through a wall mounted TCMM or TCMMB.
• No scheduled maintenance will be required over the entire life of the activation system.
• TCMM & TCMMB to be approved to ETL UL507 (US & CANADA) and CSA C22.2 (Canada)
• TCMM & TCMMB enclosure to be NEMA UL508 Type 3R, 4, 12, and 13.
• TCMM to contain an adjustable timer.

TCMM system power sequence start/stop shall have a 2-5 seconds sequence delay between pairs of units to prevent heavy power draw. (This Qualifies as a Green Design)
• A photoelectric-eye to span up to 200 contiguous feet of bay doors and be able to operate at least seven feet (7’) off the floor. Doors not in-line with other doors or having obstructions with over four feet (4’) of wall or barrier protrusions eliminating a clear line of site will require a separate photoelectric-eye beam.

• Each bay door shall have a bracket installed one per door below the eye beam to break the beam as the door goes up or down, thereby triggering the activation system to start/stop.

• Door opening, closing, apparatus egress or ingress must activate all units within the apparatus bays.

• TCMM & TCMMB must be able to accept three or more alternate methods of activation including.

Please list all activation methods and price in the additional equipment portion of the bid.

Comply with the above specifications? Yes__   No__

1.7 EQUIPMENT FILTERS:
Filters are a critical component of the system and MUST comply with the following criteria. All filtration media must be separately housed in a self contained compartment with sealing on the filter door to avoid gas/particulate bypass, tight fit, filter compartment to eliminate diesel and contaminant bypass of the individual filters. Filter door closure must contain seals to avoid bypass air.

The Units must contain at a minimum a pre-filter, secondary filter, and gas phase filter. All filters used shall have pictures of the filter and the manufacturer’s specifications must be provided. All filters must be designed to perform up to six (6) to 48 months, based on environmental conditions.

There shall be one extra set of filters for each unit bid.

Comply with the above specifications? Yes__   No__

1.8 WARRANTY:
The bidder shall guarantee all materials, equipment, and workmanship for a period of no less than FIVE(5) years, excluding obvious misuse. Warranty is to include all costs for these parts and labor yet, excluding consumable filters. Defects shall be made good at the bidder’s expense with no cost or obligation to the owner. Bidder shall not be responsible for system misuse; abuse, and natural disasters, components not operated under normal industry use, has been repaired, altered or modified. If any failure should occur, bidder shall repair or replace (with new or remanufactured parts), at his option, the product without cost. All repairs shall be completed at the original installation site of the product however bidder reserves the right, at his cost, to remove and return the product to the plant where the product can be inspected, repaired or replaced and then returned and reinstalled. Bidder shall be responsible for all labor costs and transportation costs, including, freight and insurance, in connection with completing a warranty work call. The warranty shall commence on the date of final acceptance.

Comply with the above specifications? Yes__   No__
1.9 INSTALLATION:
Installation will be performed by qualified installers with experience of a minimum of ten (10) like department installations of same type equipment. Inspect each unit installation to verify installation for warranty reasons is required. Osage Beach Fire Department will be responsible for the electrical energy source which is capable of providing the proper voltage and current requirements of the electrical components within the system. The vendor shall provide Installation, Operation and Service Instruction Manuals for each installation.

Comply with the above specifications? Yes__  No__

2.0 REFERENCES AND PRIOR INSTALLATIONS:
All bidders must provide references of NO LESS than five (5) installations with a minimum of five (5) different districts, within the last two (2) years in Fire/EMS departments in the geographical area of the final installation.

Comply with the above specifications? Yes__  No__

DELIVERY:
Delivery and Installation in days after bid acceptance: _______________________
EXCEPTIONS PAGE--To Be Filled Out By Bidder:

(All Exceptions Must be noted below)

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