



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## Notice of Bid

The City of Pigeon Forge is requesting bids from qualified vendors on a **Vehicle Exhaust Removal System** for the City of Pigeon Forge Fire Department. Bid specifications are enclosed or may be obtained at the Pigeon Forge Fire Department Monday through Friday between the hours of 8:00 am to 4:30 pm. Proposals not meeting the requirements will be rejected.

The City of Pigeon Forge reserves the right to reject any or all bids or to accept the deemed most favorable to the city. We also reserve the right to accept any portion or all of a bid.

Bids must be good through June 1<sup>st</sup>, 2018.

Bidder agrees by placing bid that no bills will be submitted to the Pigeon Forge Fire Department until all items on order are received and accepted by the Pigeon Forge Fire Department as correct.

Bids will be received by the City of Pigeon Forge until 1:30 pm (Eastern Time) January 22<sup>nd</sup>, 2018 at which time they will be opened and read aloud at Pigeon Forge Fire Department.

Bid specs can be found online at [www.cityofpigeonforge.com](http://www.cityofpigeonforge.com)

Any question on any item listed, please call Pigeon Forge Fire Department at (865) 429-7381.

All bids must be dated, signed and words "**Vehicle Exhaust Removal System**" shall be prominently displayed on the outside of the envelope.

Address all bids to:  
Pigeon Forge Fire Department  
Attn: Tony L. Watson  
P.O. Box 1350  
Pigeon Forge, TN 37868-1350



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## LEGAL RIGHT TO SPECIFY

The Pigeon Forge Fire Department (for the remainder of this section referred to as the “specifier”) chooses to exercise its legal right to specify as determined by the U.S. Supreme Court’s affirmation of the decision handed down in the case of Whiten Corp. vs. Paddock. by the U.S. District Court of Massachusetts, the First Federal District Court, which in effect states:

- 1) That as trained professionals; specifiers make informed judgments on products that they feel best serve their needs. Also, that proprietary specifications (if chosen) **DO NOT** violate any antitrust laws. technically, very few brands of material or equipment are exactly alike, and if the specifier wants to limit the specifications to one source, he has the right to do so and enforce it.
- 2) Only the specifier has the responsibility and judgment for determining whether a proposed Substitution an “or equal”.
- 3) That from start to finish in the purchasing process, only the specifier can ultimately decide if another desirable product is available in lieu of the specification.
- 4) Finally, that the courts conclude “the burden is on the supplier or manufacturer, who has **NOT** been specified, to convince the specifier that their product is equal for the purpose of a particular project”.

The specifier has determined that this product specification shall represent the product to which all offerings shall be compared. Due to the fact that fire firefighting is an **ULTRAHAZARDOUS, UNAVOIDABLY DANGEROUS** activity, only trained Fire Department personnel with specific knowledge in the area shall be allowed to make the final determining decision on the selection of the appropriate product to serve the Pigeon Forge Fire Department’s needs.

### 1.1 Extraction System Overview



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



1.1.1 The vehicle exhaust hose system portion of the project shall be designed to vent 100 % of exhaust gases and particulate safely to the outside of the fire station. The exhaust system shall be designed and installed by factory-authorized personnel, which have been certified by the manufacturer of the exhaust system. Manufacturers shall be required to have a minimum of five years of proven manufacturing experience in the manufacture of emergency vehicle exhaust extraction equipment with a minimum of 250 installations. This experience must include a vehicle (or) vehicles that have made 1200 emergency response calls a year for a minimum of 5 years. The purpose of this section of the specification insures that the vendor has a proven system for durability in high run departments.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.1.2 This specified requirement allows the fire department to use the exhaust system for checking the vehicle pump and engine when it is inconvenient to do so outside the station house and without creating unnecessary performance criteria.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.1.3 System Description: The vehicle exhaust system shall be a 100% source capture system designed with no hanging loops for the back-in bays and/or suction rail for drive thru bays.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.1.4 Provide the equipment, delivery and installation of an air filtration system as specified to supplement and enhance a hose drop vehicle exhaust system. The design will reduce carcinogenic fume exposure whenever the hose drop system is not engaged, during down time or fume exposure from off gassing of turn out gear, off gassing from penetration of equipment exposure to carcinogenic fume from emergency sites or small engine startups inside the bay area. The air filtration system shall include an activation system to automatically start the equipment to capture, reduce or eliminate vehicle exhaust products from the apparatus and contaminants generated by other sources. A peripheral or circular air pattern shall be used to effectively move contaminant from unit to unit. Adequate equipment must be supplied to provide a minimum of 5 air changes per hour in the entire bay area when the photo eyes are engaged for an emergency run. All other times the air cleaners shall produce a minimum of 2 air changes per hour. This formula for determining the number of units will be used unless otherwise specified. The equipment shall be designed to operate 100% of the time utilizing an eco-friendly energy efficient motor blower combination. The following depicts the equipment necessary to achieve the departments goals:

(7) SFTM 301- 30' Sliding Flex-Hose Track (No Loop) Systems with Two 5" Diameter Hose Drops s and 7 No-Leak Nozzles



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



- (1) 80' Suction Rail SSRM 802 (No Loop) System with Two 5" Diameter Hose Drops and 2 No-Leak Nozzles
  - (1) Ten Horse Power 3 phase fan with a minimum of 5600 CFM @ 6" WC
  - (1) Advanced Control Panel
  - (9) Pressure Sensors
  - (1) Silencer for 10 HP fan
  - (1) Diverter Valve inline 5" and Diverter Valve Controller
  - (2) Eco Friendly Air Cleaning Systems
  - (2) PCO Photo Catalytic Oxidation Components
  - (2) Sets of Photo Eyes
- Turn Key Installation Included

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 1.2 Airflow requirements

1.2.1 Exhaust system shall be designed to eliminate vehicle exhaust gases by creating a negative pressure vacuum from vehicle tailpipe to the inlet of the fan. The exhaust fan shall provide a minimum of 600 cfm at 6.0 inches static pressure loss to allow for any future expansion. Motor/ Blower curve information from the manufacturer must be provided with the bid document showing air handling capacity at various static pressure losses.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.2.2 This exhaust system shall extract hot exhaust gases by creating a vacuum around entire exhaust tailpipe to draw the exhaust gases and particulate into the connection nozzle and induce cooler, ambient air at the universal nozzle and tailpipe adapter connection.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.2.3 The system shall be designed to vent toxic exhaust gases when the exhaust fan is not powered up at engine start-up due to power failure by means of one-way ambient airflow tailpipe adapter that employs a high temperature silicone check valve at the nozzle connection to seal off the backwash of toxic exhaust gases when vehicle is connected to the exhaust extraction system.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.2.4 Totally airtight exhaust extraction systems must employ ambient air induction to cool hot gases down to save the life of the flexible hose and exhaust fan motor bearings.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



1.2.5 Exhaust system hose drops shall be the same cross sectional diameter as the vehicle tailpipe or greater. Also, exhaust system shall maintain CFM that matches the cfm of the vehicle engine exhaust when running at 1500 RPM.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

### **1.3 Overall System Performance**

1.3.1 System must be designed solely for high temperature vehicle exhaust applications. The system shall automatically activate, disconnect, shutdown, and reactivate during an emergency situation without human operation.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

### **1.4 System Warranty**

1.4.1 Complete exhaust system warranty shall be for a minimum of 5 years.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

1.4.2 Any vendor claim of proven long-term durability must be illustrated on the specific product mentioned in this specification.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

### **1.5 Turnkey Installation**

1.5.1 Complete exhaust system including the exhaust fan, control box, ductwork, nozzle and tailpipe adaptor unit shall be proven and field tested for a minimum of 5 years in the United States of America.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



1.5.2 All system components shall be labeled with manufacturer identification.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.5.3 Installation of Exhaust System shall be accomplished by a factory authorized installation team that specializes in the business of installing emergency response exhaust systems. Installations must be performed by installers that have been trained and certified by manufacturer.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## **1.6 Air Testing**

1.6.1 The overall design shall include individual systems for each apparatus that are specifically designed for the output CFM of the apparatus engine.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.6.2 The design CFM for each vehicle shall be a minimum 600 CFM.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.6.3 The designed CFM stated has been selected to insure that exhaust system will not restrict airflow of exhaust gases as they are ducted to the outside of the station.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

1.6.4 Air balancing shall be performed to insure that the designed CFM requirements are met for each bay.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## 1.7 Final Acceptance

1.7.1 At conclusion of installation of exhaust system all vehicles in the facility will be operated for a period of 15 minutes to insure that extraction hose, ducting, and fan have been sufficiently sized for all the vehicles operating in the fire station by providing negative pressure from the connection nozzle to the exhaust fan.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 2.1 Method of Nozzle Attachment

2.1.1 The exhaust system shall be attached to the vehicle within 3 feet of the door threshold.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

2.1.2 The system shall be designed so that attachment to exhaust hose is accomplished by the operator standing erect and with one simple motion connect system to vehicle.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 2.2 Method of Nozzle Release

2.2.1 The disconnection of the hose shall not be *speed dependent* and have a balancer that lifts the exhaust nozzle off the vehicle tailpipe. The nozzle must separate from the tailpipe at the same point each time regardless of the speed of the vehicle.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

2.2.2 Any auto-release system that is speed sensitive requiring the driver to modify the exit speed to control the nozzle release, shall not be accepted. Any nozzle requiring support systems such as compressed air or electrical support to operate or release shall not be accepted.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## **3.1 Extraction System Mounting Methodology**

3.1.1 System track must be supported a minimum of every 10 ft. and no more than 5 feet of track shall be cantilevered from the end of the first and last support. A minimum of 2 supports shall be required for track systems that are 20 feet in length. Systems that are longer than 20 feet long must have at least 1 support every 10 feet.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

3.1.2 The exhaust system shall be suspended from the building structure by means of aluminum vertical supports with galvanized strut attached to the building structure that is designed to eliminate side to side and front and back sway of exhaust system track or rail profile. The forces that are calculated must correspond with the release method of the exhaust system.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

3.1.3 Overall look of suspension system must match the station quarters in a way that will benefit the appearance of the facility. All vendors must carefully examine the station house and publish their method of supporting the exhaust system which includes maneuvering around bay doors.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

## **3.2 Flex-Hose Track**

3.2.1 The Flex-Hose Track shall incorporate a lightweight aluminum track support system to convey the exhaust hose from door threshold to vehicle park position.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

3.2.2 The aluminum track shall be of box lock design with two cross supports for rigidity and be engineered to carry the specific weight of all exhaust system components attached to the track as well withstand the pull forces placed upon system when vehicle exits the station.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No





# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



3.2.3 The bottom section of the box lock track shall carry a minimum of 20 roller clips per 20' track that will support the horizontal flex-hose. Systems that use steel unistrut or aluminum H track design are not acceptable.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 4.1 Sliding Horizontal Hose

4.1.1 Shall be 6" diameter with a galvanized steel external helix. Hose material shall be Hypalon coated polyester fabric. Hose compression ratio shall be 6:1

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

4.1.2 The horizontal extraction hose shall be suspended from the guide track, which stores the hose up and out of the way to ensure a safer approach to the apparatus.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

4.1.3 The horizontal hose shall be capable of withstanding temperature of 370 and above.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

4.1.4 This hose shall be supported every 12 inches using hose carrier trolleys and carrier clamps. This design eliminates hose loops and can be used in all tight quarters as designated in the bid. Any system using a hose loop in these designated bays is not acceptable.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 5.1 SUCTION RAIL

5.1.1 The suction rail system shall be comprised of Rail Sections which shall have aluminum top profile length of ten feet (10'). Material shall be 6063-T-5 with a standard mill finish.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



**City of Pigeon Forge**  
**Fire Department**  
Tony L. Watson, Chief



5.1.2 The aluminum rail shall be constructed from a one-piece continuous extruded aluminum profile. Construction shall be 6" round in diameter, with guide rails on each side to accommodate the external trolley assembly, and a slotted profile in the top for leg and support bracing. Rail wall thickness shall be 0.150. An opening of 3" along the bottom of the rail shall incorporate slots on each side to accept a pair of molded neoprene rubber seals. Seals shall be installed into the bottom of the rail, to seal the tube and prevent the escape of exhaust gases while being extracted. A vacuumed form ABS molded end cap shall incorporate in its design, both an end cap feature and a hose connection.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.1.3 The end cover will seal off the ends of the rail. The total weight of these rail sections shall be 6 lbs. per foot.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.1.4 The system shall further have suspension attachments, which shall be placed a maximum of 10' apart, for the purpose of rail support, and will be mounted in pairs from roof beams or brackets.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.1.5 Connection to a fan shall be by means of a direct connection, thru molded end cap or by fabricated sheet metal plenums. When plenums are used, connections are made on top or sides of the rail. The complete rail system shall provide means of exhaust extraction, for vehicles moving within a work area.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

**5.2 SUCTIONRAIL TROLLEY ASSEMBLY**

5.2.1 The trolley assembly shall be of external guide rail design. The assembly shall be designed and constructed, using a tube frame assembly with removal outer side assemblies, and finished in a powder-coated blue.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



5.2.2 Four wheels, using oil less bearing design, shall insure long life and allow the trolley assembly to roll freely along the external guide rails. System crabs or trolleys that incorporate wheels that roll inside the suction rail will not comply and will be rejected.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.2.3 The chase shall include a fitted cone assembly, designed to part the memory sealing lips. The cone assembly shall be designed with a series of friction rollers. These rollers shall be designed to reduce the resistance between the memory lips and the cone assembly.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.2.4 The trolley shall be fitted with a front and rear rubber bumper, designed to eliminate metal-to-metal contact, which otherwise might cause damage to the assemblies.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 5.3 Crab Inlet Plenum

5.3.1 Plenum shall be designed and manufactured from 16 gauge CRS with a powder coated silver finish. A balancer attachment ring shall be fabricated in the center of plenum, to insure complete balance and weight distribution.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

5.3.2 The attachment ring shall connect the balancer to the crab assembly. This design and feature will insure that the downward force exerted on the wheels shall be evenly distributed, to insure long life to the trolley assembly and produce the most efficient overall operating results. The plenum shall incorporate an isolation damper, insuring a positive fan startup.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## **5.4 Adjustable Shock Absorber End Stop Assembly**

5.4.1 Shock absorber assembly shall incorporate an adjustable pneumatic cylinder, capable of reducing the forward impact of the trolley assembly, without causing damage to either the suction rail or the trolley assembly.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

5.4.2 The assembly must be designed to have adjustable movement throughout the entire length of the rail. The assembly shall be designed to allow for a full stop of trolley (trolleys) in less than 6”.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

5.4.3 A rubber bumper shall be located on the trolley assembly and designed as a contact point. The pneumatic cylinder shall be equipped with a rubber bumper end stop. Both bumpers shall be assigned to align upon impact, and at no time shall metal to metal or plastic to metal contact be allowed.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

## **6.1 The System Balancer**

6.1.1 The hose balancer shall be designed to operate as a non-locking or self-locking adjustable balancer with a lifting capacity of no less than 31 lbs so that the connection of the exhaust system to the vehicle tailpipe is made simpler and easier for emergency personnel.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

6.1.2 System balancer shall be calibrated and certified to carry the hose weight and have the capability to lift nozzle off the vehicle tailpipe by using a 0.80 coated stainless steel aircraft cable no more than 40” in length and incorporating a 5/16 snap hook for easy attachment. Optional safety chain or cable shall be made available if required.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



6.1.3 Steel housing shall incorporate a high impact power-coated bright blue finish for high visibility.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

6.1.4. Balancer shall be manufactured in the USA in a ISO certified facility to American Standards.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## **7.1 Extraction System Exhaust Vertical Hose**

7.1.1 The flexible exhaust hose is manufactured for the sole purpose of venting high temperature exhaust gases, which are produced by internal combustion engines.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

7.1.2 Flexible Hose shall be high temperature synthetic rubber impregnated into a high temperature laminated fabric with wire spacing equaling 3/4" apart, continuing throughout the entire hose, with a minimum thickness of 0.080, and including a minimum overlapping thickness of 2 7/16".

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

7.1.3 Construction of hose must be capable of operating at a continuous temperature of 400°F and intermittent temperatures of 500°F.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

7.1.4 The exhaust hose diameter shall be a minimum of 5 inches depending on the size of the vehicle engine and corresponding exhaust pipe diameter. Hoses that are 4 inch in diameter will not be accepted.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

7.1.5 Hoses shall be individually sized for each bay depending on the types of vehicles that are to be used in the bay that the Exhaust system is installed. The exhaust hose shall not have any pieced together connections so as to avoid diesel exhaust leakage.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



7.1.6 Any exhaust system that relies on static regain from the vehicle engine or uses the engine horsepower to push the hot exhaust gases into the exhaust system shall not be accepted. Any ventilation system design that allows for hose a diameter smaller than the vehicle tailpipe shall not be accepted.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## **8.1 Universal Nozzle**

8.1.1 Engineered and specially designed exhaust system nozzle (female connection) that is specifically designed to fit tightly over the circumference of an engineered mating ring (male connection) that attaches to the tail pipe and attaches tightly around the ring to capture 100% of the carcinogenic diesel exhaust fumes.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

8.1.2 Incorporated in the rubber boot are 4 to 8 powerful rare earth magnets which are strategically located inside two sets of metal pole pieces that pivot in and out to allow for smooth release of vehicle tailpipe.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

8.1.3 System shall allow positioning of the nozzle over the mating ring to produce a required substantially airtight seal, eliminating backwash of diesel exhaust fumes into the station.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

8.1.4 The release of the nozzle shall be activated by a forward motion of an apparatus simultaneously causing a lifting and backward motion of the release nozzle. This action shall institute a simple mechanical release. The simple release shall be based solely on the upward pull of the system balancer, which causes the pole pieces to pivot on the tailpipe radius and release over the flared end of the tailpipe.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## 9.1 Aluminum Transition Elbow Assembly

9.1.1 The nozzle shall be fitted to Cast Aluminum Elbow Transition, manufactured from 319 aluminum and incorporating a 62° degree curved angle. A special rag screen channel cast into the elbow shall allow for easy installation of replaceable non-static preformed spring steel rag screen with black oxide finish. A large 7" inlet opening shall incorporate a 1" mounting flange with molded locating pin for easy and accurate installation of rubber boot assembly. Aluminum elbow assembly shall be offered in all hose sizes, 4, 5 and 6 inch.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

9.1.2 Removal spring wire rag screen must be pre-formed spring steel oxide treaded finish.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 10.1 Tailpipe Adapter

10.1.1 Tailpipes that are connected to the system shall be retrofitted with a tailpipe adapter (male end). The tailpipe adapter allows the nozzle (female end) to fit tightly against the outer edge of the mating ring on tailpipe adapter.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

10.1.2 The ring shall contain a series of machined 3/4" oval holes placed around the circumference of the ring, which allows cool ambient air to enter into the exhaust hose reducing the temperature of the diesel exhaust, and thereby extending the life of the exhaust hose.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



10.1.3 The circumference of the mating ring shall have a one-way silicon check valve rated at a minimum 600 degrees that opens or closes depending on the exhaust system airflow condition, when air pressure is either positive or negative. When the exhaust system is in a positive mode, the one way check valve will press against the holes on the ring and close off the ambient air intake. This will prevent any backflow of diesel exhaust into the firehouse. When air pressure in the nozzle is negative, which is the normal condition; a silicone check valve will remain open and will prevent any harmful carcinogenic materials from back washing into the apparatus bay and/or filtering into the living areas as well as cool the exhaust temperatures. Ambient air - introduction at the nozzle/tailpipe adaptor will also protect the apparatus engine from backward spinning of its turbo engine when the fan is activated by another vehicle engine startup located in the adjacent bay and that apparatus is not operational.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

10.1.4 The tailpipe adaptor should incorporate 5 - 25 degree Stainless Steel turndown veins inside the 5 inch diameter circumference of the tailpipe to protect the public and public property as well as fire personnel from accidental burns or discoloration of property. This will be accomplished by directing the hot exhaust away from the fire fighter and downward 30 degrees toward the ground.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 11.1 Exhaust Fan Overview

11.1.1 The exhaust fan shall be sized for a minimum of 600 CFM per extraction. The induction of ambient air at the tailpipe connection shall insure that the exhaust temperature at the fan will be less than 150 degrees at the fan motor.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.1.2 Each exhaust fan shall be designed specifically for the fire station with these factors being addressed:

1. The size and total number of vehicles being attached to exhaust fan.
2. The overall design of fire & emergency vehicle bays.
3. The location of the living quarters.
4. The existing electrical phase
5. The physical location of the fire station in the community that is served by the fire department (The sound level of the fan motor while in operation).

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No





# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



11.1.3 The sound decibels generated by the fan motor and impeller shall not exceed 81 Db at 5 feet.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.1.4 No motor that allows exhaust temperatures in excess of 200 degrees shall be accepted.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.1.5 System shall allow for pump checks to be conducted indoors. System shall allow for pump checks to be conducted for 15 minutes or more without damage to the system. Exhaust fan system shall provide negative pressure from system nozzle connection to exhaust fan inlet ductwork.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 11.2 Fan Airflow Criteria

11.2.1 Shall be designed as a pre-engineered exhaust fan designed for the sole purpose of exhausting Volatile Organic Compound (VOC) and carcinogenic compounds generated by internal combustion engines designed to propel any motor vehicle.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.2.2 The exhaust fan should operate automatically only during the point of when electrical power is administered to the totally enclosed fan motor.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.2.3 Blower wheel design shall be backward inclined with minimum horsepower motor to produce the desired results for optimum efficiency and long term viability.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



11.2.4 Fan shall be capable of delivering a minimum of 600 CFM at 6" negative static pressure for 5" diameter hose drops.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.2.5 Fan will not be designed with static regain from vehicle engine to assist in meeting the performance criteria mentioned in next paragraph. At no point shall the diameter of the hose drop be less than diameter of vehicle tailpipe.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 11.3 Physical Fan Data

11.3.1 Fan housing shall be heavy gauge welded steel construction suitable for temperatures up to 250 degrees. Housings shall be provided with drilled inlet and discharge flanges. The discharge flange shall be "full flange" design.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.2 The housing frame shall be constructed with four flat sides to allow for discharge change to vertical or horizontal positions with disassembly of unit.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.3 Fan Impeller blower wheel shall be backward curved single thickness aluminum blade design.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.4 Welds on fan housing shall be performed by factory-qualified personnel who have met the requirements of ASME Section IX.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.5 The first resonant speed of each rotor shall be not less than 125 percent of normal operating.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



11.3.6 Rotor shall be two plane dynamically balanced to a maximum final vibration level of 1.0 mil.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.7 Fan Motor shall be UL listed and manufactured by a readily available nationally recognized motor manufacturer. Motor shall be a permanently sealed and lubricated motor. Motor shall be supplied as a totally enclosed fan cooled or non-ventilated type with a readily available NEMA frame from 56-145T and designed for an application where standard use is intermittent starts on average of ten times per day.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.8 Motor bearings shall be heavy-duty anti-friction, self-aligning ball or roller bearings with positive shaft locking.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.9 Fan Motor Vibration Isolation shall be manufactured as a complete assembly to assure the least possible vibration or movement. Fan wheel shall be both statically and dynamically balanced.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.10 Fan Motor Power shall be 3 phase whenever readily available in station. Single phase shall only be used when the cost of providing 3-phase power becomes prohibitive or when adequate supply of usable breakers is not available or otherwise instructed by the city.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

11.3.11 Fan Motor Labeling and Identification must bear the same manufacturers name as the primary exhaust ventilation equipment and electrical controller operating it. Also listed on labeling shall be model number, RPM, pressure, inlet size, outlet size, temperature limitations, break horse power, CFM, class, and any warning labels or instructions required by Underwriters laboratories (UL).

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## 12.1 System Ductwork

12.1.1 All galvanized ductwork shall be spiral G-90 galvanized pipe and shall be a minimum of 26-gage pipe sizes for 4" – 8" in diameter, 24-gage pipe for sizes 8 1/2"- 15 in diameter, and 22-gage pipe for sizes 16"-22" in diameter.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

12.1.2 Duct Seals on the connection shall be with 400-degree silicone. Brazing and welding at joints are not required because duct system is designed for 7" of negative pressure and at these pressures the silicone sealant is sufficient to seal the system. The lateral fittings shall be brazed or welded and must be designed with a minimum 45 degree branch taps for a smooth convergence of two or more airstreams.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

12.1.3 If duct system is designed for more than 7" static pressure than welding, brazing, and additional mechanical seals shall be required for the sole purpose that ductwork is used as an extension of the exhaust pipe and at times is placed under positive pressure.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

## 13.1 Auto-Start Control System

13.1.1 Shall be designed to sense the output pressure, which is normally generated by any internal combustion engine designed to operate any gas or diesel engine. The operating logic must be designed to complete this cycle. When the nozzle is connected to the vehicle's exhaust tailpipe and the vehicle is started by the operator an automatic controller, senses the increased output pressure and energizes the exhaust fan. A low voltage timer will keep the exhaust fan operating for a period of time designated by fire department procedures.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



13.1.2 Electrical controller must be UL listed/approved and manufactured in accordance with Underwriters Laboratories standard UL-508 enclosed industrial control panels and incorporate a limited energy control circuit.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.3 Control Panel enclosure must be NEMA 4X rated and UL standard 508A (CSA standard 22.2 No 14 Fiberglass material must meet the UL 746C standard.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.4 Control Panel shall be a wall mounted electrical enclosure and restrict access to internal components by others, except authorized personnel.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.5 Electrical contractors shall be provided with the appropriate adjustable overload relays to meet the proper full load amperage of motor it is designed to control. Contactor must conform to the following standards: BS-5424, VDE0660, and approved by UL certification as an approved component.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.6 Controller transformer to be UL listed industrial control circuit transformer with primary and secondary fuse blocks. Transformer must be provided with multi-tap primary 208V through 480V, AC, and 24V through 120V secondary.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.7 Controller timer shall be solid state, 60 min variable timer. Operating logic must complete this cycle. Input voltage is applied to the timer at all times. Upon closure of a normally open isolated start switch, the load energizes and remains energized as long as the switch is closed. When the start switch opens, the timing cycle starts. At the end of the present time delay, the load de-energizes and the timer is ready for a new timing cycle. Timer must be UL recognized component under file number E65038.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



**City of Pigeon Forge**  
**Fire Department**  
Tony L. Watson, Chief



13.1.8 System pressure sensor must be engine pressure sensing type capable of recognizing the output pressure of any type of motor vehicle. Electrical contact must be dry type and not exceed 24V.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.9 Stop/Start Switch located on exterior of Controller shall be a red illuminated contact button. This device must meet UL type 4X rating. Indicator light/start button must be mounted on the enclosure cover and be identified by engraved ledger plate.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.10 Controller Supplier will fully guarantee a minimum of two-year warranty on parts. Exceptions are obvious misuse and/or abuse to the system.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.11 System shall be offered with Wireless low-voltage Sensor operation.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

13.1.12 System shall be offered with Photo Eye overhead door activation to start system when eye beam is broken.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

**14.1 AIR CLEANING SYSTEM**

14.1.1 The cabinet shall be manufactured with 16 gauge steel and be of one piece construction which contains the filter group and the blower assembly. Cabinets of two piece construction bolted, clasped, or riveted together are not preferred. For ease and safety the unit must have both filter and blower compartment access doors. Door access panels shall be fully hinged for entry to filters and motor blower compartments. Unit shall be equipped with four-way adjustable diffuser grilles manufactured of extruded aluminum. Cabinet finish must be proven durable, must have green LED run light as well as Red LED filter change indicator visible from the floor level.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



14.1.2 Motor Blower: Shall be direct-drive, forward curved blades; 1 HP 1075 RPM, dual voltage 208/230v, 9 amps, single phase, electronically commutated (ECM) motor, automatic reset thermal protection. The RPM of the motor will vary as the 0–10V input is varied by the programmable electronic controller. This energy efficient motor will maintain its CFM as the torque of the input increases or decreases. RPM will vary based on the input of particulate, gases or timer.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.3 Unit sound level rating shall not exceed 65db at 6 ½' under the unit.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.4 The air cleaners will operate continuously at a nearly inaudible sound producing 3 continuous air changes per hour in the bay area. The circuit is activated to increase the air flow from the minimum continuous air flow to 10 air changes per hour when a vehicle passes and blocks the photoelectric sensor, or the panel detects another input programed to start the system at that point the motors will start to sequence up the RPM with a 3-5 second delay between motors. This reduces inrush currents to reduce the possibility of tripping the circuit protections on the main power panel. The motors will run for the predetermined time from the last input signal which can be set between 1-60 minutes of run time. This time can also be set in the field, if necessary. In manual mode the motors will run continuously on maximum speed.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.5 The unit shall provide a time boost setting to provide a preset amount of run time for the motor to operate. This will start the system for one run cycle while leaving it in auto mode functioning only; upon depressing the Time Boost the motors will sequence on and run the units on maximum speed for a predetermined length of time unless the system's stop is pushed or the unit switch is changed to the Manual mode. In either case, it causes the Time Boost to reset.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.6 The product components must be UL or ETL certified. The product as a whole shall be manufactured and assembled in an **ISO9001-2008** facility.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No



**City of Pigeon Forge**  
**Fire Department**  
Tony L. Watson, Chief



14.1.7 Electrical Control panel shall be constructed of polycarbonate NEMA 4X rated enclosure. The panel must be UL or ETL certified as a complete assembly. The panel shall have an optional capability to be padlocked. Panel shall incorporate a touch LCD display with system stop, automatic and manual run modes, as well as the timer programming mode, the display will show when the system is running, and when wired to an optional filter relay, has the ability to show when the filters need to be changed. An internal programmable CPU shall provide easy operational changes. The control panel shall incorporate sequencing motor start operation; inputs for long range photo electric sensors with easy set-up CO/NO<sub>2</sub> sensors ready for connecting as needed or desired.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.8 First Stage shall be of extended surface pleated type 24 x 24 x 4" (NOM). It shall be rated at **MERV 11** where tested in accordance with ASHRAE 52.2 Test Standard.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.9 Second Stage shall be 24 x 24 x 12" (NOM) and shall be rated at **MERV 16**, HEPA grade air filter with efficiency based upon 0.3 micron size particle. The filter must trap and retain particles to ensure personnel safety. The filter shall have a minimum of 202 square feet of media area and dust holding capacity of 200 grams.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.10 Third Stage shall consist of; Photo-Catalytic Oxidation (PCO) section shall be included equipped with 2 UV lamps of at least 3 milliwatt / CM<sup>2</sup> UV-C 254 nanometers and a titanium dioxide TiO<sub>2</sub> coated grid with a minimum of 70 square feet of TiO<sub>2</sub> covered surface area. This combination converts dangerous carcinogenic substances into harmless substances of CO<sub>2</sub> and water vapor giving maximum protection to fire personnel.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No

14.1.11 The air cleaner shall be equipped with a carbon filter filled with a combination 50/50 blend of activated carbon (fourth stage) and potassium permanganate on zeolite (fifth stage). Flat faced filters are not acceptable as they produce excessive static pressure resistance. The pollutants from diesel exhaust, unspent diesel fuel, sulfur-based compounds, nitric acid, and nitrogen dioxide shall be absorbed into the material and removed from the air stream. The gas phase chamber shall have a minimum of 26 lbs. of carbon, potassium permanganate, zeolite blend.

**Does Your Bid Comply With All Aspects of This Section.**      Yes       No





# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## 15.1 POINT OF ORIGIN

15.1.1 Equipment shall be manufactured by a U.S. Company that is headquartered in the United States of America. All components shall be American Standard. All standards of quality must be met and adhered to including but not limited to: UL, NFPA, AMCA, IMC, ASME, UMC, NEC and all local and state building codes.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

15.1.2 Company providing the exhaust venting system must have a U.S.A. ISO 9001:2008 current certifications, a copy of the document must be provided with the bid package.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

## SHIPPING and DELIVERY

- The bid pricing shall include all shipping and handling charges.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

- The bid shall allow for 100% delivery before items are paid for.

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No

- The bid shall guarantee pricing until June 1<sup>st</sup>, 2018

***Does Your Bid Comply With All Aspects of This Section.***      Yes       No



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



## COMPARATIVE BID ANALYSIS

City of Pigeon Forge Fire  
Department

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Vendor:

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Description of items	Quantity	Unit Price	Total price
<b>Freight</b>			
<b>GRAND TOTAL:</b>			



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



### Percentage Specifications Compliance Calculation

	Total Number of "Yes / No" Questions		
	Total Number of <b>Yes</b> Answers		
	Total Number of <b>No</b> Answers		
$\% \text{ Specification Compliance } [(Total \text{ Yes Answers}) / (Total \text{ Answers})] \times 100\%$			<b>%</b>
<p>Each "<b>No</b>" answer requires a full written explanation.</p> <p>Each "<b>Yes/No</b>" questions not checked where provided will be considered a "<b>No</b>" answer.</p>			



# City of Pigeon Forge Fire Department

Tony L. Watson, Chief



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## BID SHEET

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

### Bid Packet Checklist:

- \_\_\_\_ Specifications
- \_\_\_\_ Proposal
- \_\_\_\_ Comparative Bid Analysis

## BID OPENING

January 22<sup>nd</sup> 2018  
At 1330