SECTION 11 11 33

VEHICLE EXHAUST REMOVAL SYSTEM

PART 1 – GENERAL

1.01 EXTRACTION SYSTEM OVERVIEW

A. The exhaust system 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, who have been certified by the manufacturer of the exhaust system. System to be installed as a turnkey project with all labor, tailpipe modifications and duct material included in the scope of work. Electrical connections and Disconnect Switch shall be part of electrical contractor's project scope.

B. The department shall be able to use the exhaust system for performing engine checks indoors.

C. System must be designed for high temperature vehicle exhaust fire rescue applications. The system shall automatically activate, disconnect, shutdown, and reactivate upon return.

D. Exceptions and variances from any of the specifications outlined in these bid specifications must be acknowledged and listed.

E. Related Documents to the specifications- Drawings and general provisions of the Contract apply to this section.

F. Acceptable Product Manufacturer and Installation to be provided by:

MagneGrip
11449 Deerfield Road
Cincinnati, Ohio 45242

1.02 QUALITY STANDARD ASSURANCE AND EXPERIENCE

A. All standards of quality are meet and adhered to: UL, NFPA, AMCA, IMC, ASME, UMC, NEC and all local and state building codes. Product is to be supplied by manufacturer with a current ISO-9001-2015 certificate in manufacturing, design, layout, and sales functions.

B. Independent System testing information documenting the overall effectiveness of the proposed system in a fire hall must be available.

C. Manufacturing Experience: Companies must have 5 or more years of manufacturing experience of automatic vehicle exhaust removal systems for the fire/ rescue market. In state references must be made available upon request.

D. Submittals indicating rated capacities and product features must be included for the following:

1. Fan power ratings with blower curves provided
2. Motor ratings and electrical characteristics
3. Hose Ratings and testing verifications
4. Controller
5. Rail and Track information as specified

E. Shop Drawings: drawing showing detailed layout of the system including elevations, length of track assembly, duct layout with detail and fan location.

1.03 SYSTEM DESCRIPTION

A, The exhaust system shall be a source capture system designed to handle exhaust fumes from diesel engines. The system shall allow movement of apparatus from bay to bay. A total of 7 capture points in1 station shall be addressed within this bid.The following equipment must be provided for the station during construction phase:

System shall include a fan of sufficient size to accommodate seven vehicles. Vehicles shall be addressed using a suction rail or flex track type system.

1.04 AIR VOLUME AND FAN REQUIREMENTS

A. The exhaust fan for the stationshall provide a minimum of 4200 CFM (600cfm per vehicle)at 6.0 inches static pressure loss.

B. The fan shall be a backward incline fan made from continuous welded construction. Fan housings that are screwed together or riveted are not acceptable.

C. Fans shall be tested and balanced prior to installation, be manufactured in an ISO Certified Facility in accordance to AMCA Certification Standards.

D. A safety disconnect in the vicinity of the blower fan motor must be provided.

E. Fan motor shall be a totally enclosed, fan cooled and comply with UL 705 and NEMA Standards.

1.05 INSTALLATION AND DUCT CONNECTIONS

A. Complete exhaust systemwith all equipment and installation including the exhaust fan, control box, ductwork, track/rail,hose and nozzle connection must be completed. Electrical work is not included in this scope of work.Tailpipe modifications from the muffler out that are required to ensure proper system operation are to be included in the scope of the work.

B. Wall penetration core drill preferred. If, roof penetration is necessary, it shall be properly sealed by roofing contractor.

C. All duct material installed as part of this project shall conform to Class II SMACNA Standards. An appropriate rain cap shall be provided on the building exterior.

D. All system components shall be labeled with manufacturer identification.

E. Installation of Exhaust System shall be accomplished by a factory authorized installation team that specializes in the business of installing emergency response exhaust systems.

1.06 NOZZLE ATTACHMENT

A. The exhaust capture system must provide complete, 100% exhaust removal at the source from vehicle start up to exit of the apparatus from the station. In no event shall the nozzle allow for the potential escaping of diesel exhaust into the bay area. A check valve is required to stop contaminant from escaping into the bay area. It is a requirement of this bid that the system be capable of capturing 100% of exhaust gas and particulate even in the event the fan does not activate. Any nozzle that does not seal completely seal 100% around the tailpipe will not be accepted.

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

C. The system shall feature "pull-down" attachment of exhaust hose for each of connection. The connection shall be accomplished by the operator standing erect and with just one simple motion to connect system to the vehicle. Nozzle can be connected at any angle with no alignment pins required.

D. Nozzle shall incorporate a stainless-steel inner ring to serves as a heat shield and isolate the magnets from the hot exhaust stream.

E. A check valve shall be incorporated into the nozzle to contain exhaust fumes and prevent leakage of exhaust fumes back into the bay. The Check Valve shall allow for introduction of cool ambient air directly across the magnets to protect magnets and flex hoses from heat. Any system that does not seal around the tailpipe to contain gases and allow for cool ambient air introduction shall be eliminated.

F. Nozzle incorporates three magnet packs that are allowed to pivot and toggle to aid in the attachment and smooth release of the nozzle from the tailpipe. Magnets are attached to a rust proof, cast aluminum plate,and allows for cool air introduction into the nozzle.

G. All adapters and nozzles must be of similar size to allow vehicles to freely move from bay to bay. Nozzle adapter shall not exceed 7inch diameter to allow adequate ground to tailpipe clearance. Adapters must be made of rust proof or rust resistant materials. Contact plate shall be nickel coated and proper thickness to ensure and maintain magnetic holding power. Adapters shall be capable of being mounted flush to the truck body without any protrusion.

H. Nozzle elbow must have inlet that is 6 inches or greater so, exhaust airflow is not impeded. Nozzle to flex hose elbow transition must also be 5 inches or larger to maximize airflow.

I. Adapter and nozzle shall be manufactured of primarily of rust resistant material to ensure consistent, good connection.

J. A rigid lower hose section with handle shall be provided to aid easy hose connection.

1.07 NOZZLE RELEASE AND MATERIAL

A. The release of the nozzle shall occur by a forward motion of an apparatus. The separation shall be accomplished by a simple mechanical release. Systems requiring support systems for nozzle separation such as pneumatics or electronics are discouraged.

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

C. Any auto-release system that is speed sensitive requiring the driver to modify the exit speed tocontrol the nozzle releaseshall not be accepted. Any nozzle requiring trip switches and support systems such as compressed air or electrical support to operate, or release are discouraged.

D. Release of nozzle from the tailpipe shall not cause tugging or stretching of the hose to occur. Stress from separation and transporting of the hose to the door shall be borne by an internal cable to prolong life of the hose.

E. Nozzle elbows constructed of one piece, cast aluminum are required to eliminate the possibility of denting, rusting and breaking.

1.08 SLIDING ALUMINUM TRACK/EXPANDABLE HOSE TRACK

A. The exhaust system shall use a lightweight aluminum track support system to convey the exhaust hose from the vehicle's parked position all the way to the door threshold. The aluminum track shall be of box lock design with two cross supports for rigidity. Systems that use steel unistrut or aluminum H track design are not acceptable.

B. An expandable hose track system shall be offered in the station to eliminate hose loops. The expandable hose shall be 6-inch diameter and have a compression/expansion ratio 0f 6:1. The expandable hose shall be attached to the track using a set of trolleys secured to the hose at 12-inch intervals.

C. Rail and track system must be supported using adjustable, telescopic support legs allowing for future adjustment and changes to the system.

1.09 SUCTION RAIL

A. To best facilitate possible situations where vehicles are parked in tandem and exited in the same direction a suction rail system must be used to provide a neat, clean installation. The suction rail system shall be comprised of rail sections which shall have a length of six feet (6'). Aluminum Material shall be 6063-T-5 with a standard mill finish.

B. The aluminum suction 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 molded slots on the top for leg and support bracing.

C. The trolley assembly shall be of external guide rail design. Four Delron wheels, using oil less bearing design, shall insure long life and allow the trolley assembly to roll freely along the external guide rails. The chassis shall include a fitted cone assembly, designed to part the memory sealing lips. The cone assembly shall be equipped with a series of friction rollers. These rollers shall be designed to reduce the resistance between the memory lips and the cone assembly.

D. A shock absorber assembly shall incorporate an adjustable hydraulic cylinder, capable of reducing the forward impact of the trolley assembly, without causing damage to either the suction rail or the trolley assembly.

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

1.10 SYSTEM BALANCER

A. The system balancer shall retract and keep the hose and nozzle from dangling on the floor for safety concerns.

B. Hose shall be supported by the balancer using a lifting elbow with an internal cable to reduce stress and wear and tear to the hose.

1.11 EXTRACTION SYSTEM EXHAUST HOSE

A. 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.

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

C. This construction of hose must be capable of operating at a continuous minimum temperature of 400°F and intermittent temperatures of 550°F. Hoses that are not rated at or higher than these temperatures will not be accepted.

D. Five-inch diameter flex hoses are preferred to smaller hoses to provide less static pressure loss and more efficient fan performance.

E. A two-foot, rigid, lower section hose shall be included with extreme heat tolerance. Hose shall be tested by independent certified laboratory to be capable to 1000 degrees F. Lower section hose additionally shall be flame retardant and be constructed using engineered materials to maintain shape and integrity.

1.12 AUTO-START CONTROL SYSTEM

A. Shall be designed to sense the output pressure normally generated by any internal combustion engine. When the nozzle is connected to the vehicle's exhaust tailpipe and the vehicle is started by the operator an automatic controller, the increased output pressure shall be detected by a pressure sensor and activate the exhaust fan. A low voltage timer will keep the exhaust fan operating for a period of time designated by fire department procedures. As an option, ignition start activation may be also offered for consideration.

B. 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. For safety, the enclosure must be NEMA4X rated fiberglass construction with a watertight seal.

1.13 SYSTEM WARRANTY

A. Complete exhaust system parts warranty shall be for a minimum of 1 year. A warranty certificate describing the warranty to be provided must be included. Location and name of nearest service outlet should be listed. Location of parts inventory shall be indicated as well. All equipment must be supplied by one system manufacturer with the complete system covered in its entirety by the manufacturer's warranty.

1.14 POINT OF ORIGIN:

A. Equipment shall be manufactured by an American Owned company, located and operated solely in the United States. Systems that are built using 100% American parts supplied from U.S. vendors are preferred. All components of the system shall be American Standard.

END OF SECTION

SECTION 11400

FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Includes all roughins and complete connections to put into operation all food service equipment and dishwash equipment

1.02 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Metal fabrications required for the complete and permanent installation of the kitchen hood system.

B. Division 22 - Plumbing: Plumbing roughins and connections.

C. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Heating, Ventilating and Air Conditioning roughins and connections.

D. Division 26 - Electrical: Electrical roughins and connections.

1.03 QUALITY ASSURANCE

A. The materials and installation of all food service equipment furnished under this Contract shall conform to the Standards of the "National Sanitation Foundation", the rules and regulations of the Local Health Authorities.

B. All electrical equipment shall have U.L. labels. All gas fired equipment shall, have AGA approval.

1.04 SUBMITTALS

A. Copies of technical and installation data shall be submitted to the Architect in accordance with Section 01340. Submittals shall describe fabrication, installation, and connection requirements of each piece of equipment.

B. Submit approved (by local and State Fire Marshall's) shop drawings and cut sheets to each trade involved in the roughing-in and final connections to the equipment.

1.05 SCHEDULING

A. Shipment of Food Service Equipment shall be scheduled so that it does not arrive at the job site before adequate storage facilities have been prepared. All items shall be examined for shipping damage at this time. Any damages shall be reported immediately to the Architect. The General Contractor shall be responsible for receiving, unloading, inspecting, and providing adequate storage for this equipment.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Refer to Drawings for equipment types and locations.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify that roughing-ins are properly installed, properly located and are of the correct size, capacity and/or rating. Do not install any equipment until all irregularities have been corrected.

B. Refer to Drawings and cut sheets for locations of various pieces of equipment.

C. The Contractor shall uncrate, assemble, erect, and set into place each piece of equipment. Respective Sub-Contractors (Plumbing, Ventilating and Electrical), shall properly connect each item of Food Service Equipment and put same into operation. Contractor shall verify that each piece of equipment has been properly installed and connected and is ready for operation.

D. Contractor shall verify proper installation of each piece of equipment and to perform "startup" and "test" of each piece of equipment.

3.02 CLEANING

A. All equipment shall be thoroughly steamed cleaned and polished, inside and outside, ready for Owner's use. Moving parts shall be lubricated as required, water faucets and strainers shall be cleaned and in good operating conditions; replace if necessary. Damaged or marred surfaces shall be refinished.

END OF SECTION

SECTION 11451

APPLIANCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Includes roughins and final connections for the Owner-provided appliances. Refer to Section 01010, Summary of Work, for requirements.

1.02 RELATED SECTIONS

A. Section 06415 - Cabinetry and Millwork: Coordination of the installation of the cabinet tops with the appliances. Coordination of cut-outs for appliances.

B. Division 22 - Plumbing: Roughins and final connections.

C. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Roughins and final connections.

D. Division 26 - Electrical: Roughins and final connections.

1.03 QUALITY ASSURANCE

A. All electrical equipment shall have U.L. labels.

1.04 SUBMITTALS

A. Copies of technical and installation data shall be submitted to the Contractor by the Owner for coordination purposes. Submittals shall describe installation and connection requirements of each piece of equipment.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Shipment of appliances shall be scheduled so that it does not arrive at the job site before adequate storage facilities have been prepared. All items shall arrive at the job site in manufacturer's original crates. All items shall be examined for shipping damage at this time in the presence of the Architect, Owner, and Contractor. Any damages shall be reported immediately, in writing, to the Architect. Be responsible for unloading, inspecting, and providing adequate storage for this equipment.

PART 2 - PRODUCTS

2.01 APPLIANCES

A. Appliances: As provided by Owner. Refer to Section 01020 - Allowances. Refer to Drawings for appliance locations. Contractor to provide support structure, exhaust duct, fan, and weatherproof termination cap for such items.

B. Roughing and final connections shall be provided by the Contractor.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify that roughin requirements have been completed and are in the correct location, of the correct capacity, voltage, etc., prior to installation and connection of any appliance item.

B. Set into place each piece of equipment. Respective Sub-Contractors (Plumbing, Ventilating, and Electrical), shall properly connect each item of appliance and put same into operation. Vendor shall verify that each piece of equipment has been properly installed and connected and is ready for operation.

C. Final installation and connection of the appliances shall meet all local health code requirements.

D. The equipment vendor shall return to the job site after installation is complete to verify proper installation and to perform "startup" and "test' of each piece of equipment.

3.02 CLEANING

A. All appliances shall be thoroughly cleaned and polished, inside and outside, made ready for Owner's use. Moving parts shall be lubricated as required; water faucets and strainers shall be cleaned and shall be in perfect operating conditions; replace if necessary.

3.03 PROTECTION

A. Protect completed installations from damage until Date of Substantial Completion. Replace damaged items with new products. Damaged or marred surfaces shall be refinished to "like new" condition or replaced, as adjudged by the Architect. Surfaces that cannot be repaired or restored shall be replaced.

END OF SECTION