





**TOWN OF MERRIMACK, NH**  
**DEPARTMENT OF PUBLIC WORKS**  
**WASTEWATER TREATMENT FACILITY**

36 MAST ROAD – P.O. BOX 235 – MERRIMACK, NH 03054  
PHONE: 603-883-8196 – FAX: 603-886-1513 – WWW.MERRIMACKNH.GOV

**To:** Kyle Fox  
Public Works Director

**From:** Sarita Croce   
Assistant Public Works Director/Wastewater

**Cc:** Michael Gorman  
Sewer Inspector

**Date:** January 20, 2021

**SUBJECT: Request to Purchase Combination Sewer Cleaner Truck for Collection Systems Operation and Maintenance**

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The Wastewater Treatment Plant is requesting permission from the Town Council to withdraw up to \$377,129 from the Capital Reserve fund for the purpose of purchasing a combination sewer cleaner truck. The budget allotted \$440,000 to purchase the truck. The selected bid was the lowest bid.

Sewer Truck Operation

The truck is used for the maintenance and cleaning of the town's collections system. This equipment serves a crucial role in the prevention of sewer system overflow; it is used as an emergency response piece of equipment to sewer system backups that if not cleared immediately would cause sewer system overflows. This is also an important piece of equipment for the roles it serves to the treatment plant itself, as it is used for the cleaning of the chlorine contact chambers for algae removal for proper sampling. It is also used for cleaning multiple tanks within the facility to reduce the physical labor of the maintenance and operations staff during heavy cleaning of the various chambers. This equipment will serve a crucial role in the cleaning of the pump station wet wells located throughout the town, and also the main pump station for the facility.

A typical truck has water tanks and a waste storage tank. The waste storage tank is typically raised to completely empty the debris tank of solids once the tank is full of solids. The process for emptying the debris body includes elevating the waste tank on the truck. This can create a tipping hazard. To address this issue the Town has elected to add 6,000 pounds of payload capacity to the rear axle and an ejector plate emptying system.

Bid Evaluation

The current combination vacuum sewer cleaning truck (Vac Con) is scheduled for replacement for this fiscal year in the approved 2020 – 2027 Capital Improvement Program (CIP), minor purchases. The Vac

Con is a 2005 combination sewer cleaning truck with a fan based vacuum blower system, and a FMC Bean water pump powering the jetting, and wash down system. The Vac Con System is mounted to an International 6 wheel body and chassis, the combination sewer cleaning truck is used year round as one of our most vital pieces of equipment for the proper functioning of the collections system. The current Vac Con will be traded in at the purchase of the replacement combination sewer cleaning truck.

The Town received bids for a new Combination Cleaning Truck on November 24, 2020. Vac Con did not submit a bid. The Table below provides a summary of the bid prices and trade in value:

Vendor	Trade in Value	Price including Trade in
HP Fairfield (Super Products "Camel")	\$30,000.00	\$369,729.00 base bid \$377,129 (including the additional payload and ejector plate)
Donovan Equipment (Aqua Tech)	\$25,000.00	\$400,614.00
CN Wood (Vactor)	\$25,000.00	\$417,713.00
JF McDermott (Sewer Equipment Company of America "900 ECO")	\$20,000.00	\$451,149.00

Based on a review of the bids Donovan Equipment was considered non-responsive to the bid as indicated below

Bid Spec Requirement	Donovan Equipment
The body shall be cylindrical having a minimum usable liquid capacity of 12 cubic yards to store sanitary wastewater removed from the sewers.  The current vehicle holds 6 yards of liquid. This limitation impacts the Town ability to clean sewers. Twelve yards allows the Town to be more effective when working remotely by minimizing work stoppage to empty the truck.	Debris body of was only 10 Yard.
A stainless steel micro-strainer (to 30 microns) shall be provided prior to the blower inlet, with (3) removable cartridge style screens and bottom drain port. Or equivalent filtration system.  This configuration protects the entire blower system by preventing particulate from entering the blowers. Dirt and rust solidify on the rotating lobes inside the blowers and typically cannot be repaired. Blower replacement is estimated to cost \$10,000.	Air filtration system not called out in bid packet, just checked off as compliant.
High pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI (submit manufacturer support documentation).  This will allow the Town to more effectively jet sewers with	Water pump not compliant with requirement. Maximum 80 psi provided in package. .

Bid Spec Requirement	Donovan Equipment
<p>high pressure water.</p>	
<p>An extreme cold weather recirculation system - minimum 25 GPM via transmission power transfer option at chassis engine idle speed.</p> <p>Insufficient water movement during freezing temperature could cause catastrophic damage to water system from freezing of water lines in the truck to bursting of lines, fittings, and complete failure of water pump. Complete failure of the system could results in greater than \$50,000 of repairs.</p>	<p>Winter recirculation system flow rate was 20 GPM. At this flowrate, observed freezing has occurred.</p>
<p>Dual outward mounted rear door props shall be included as standard to prevent operator from entering door swing path when engaging rear door prop. This is a single piece of steel that keeps a door open during hydraulics failure. 2 props are required in case of failure of the single.</p>	<p>Single door prop. A second prop would need to be affixed to the truck.</p>
<p>All water tanks shall be fully baffled for maximum compartment storage of 150 gallons.</p> <p>Excess of 150 gallons storage per compartment will render the truck less stable when turning, stopping (off-road) and working on uneven surfaces.</p> <p>Trucks with larger baffle storage quantities are typically used in Town/Cities where most of the work is completed on paved flat surfaces. The Town currently spends a large amount of time on cross county runs which are not paved or flat.</p>	<p>Tanks are baffled, in increments 137 gallons over spec (287 gallons).</p>
<p>The body shall be capable of high dump height of 60".</p> <p>This specification allows to flexibility to dump into containment areas when required (dumpster, high berm).</p>	<p>Only capable of 42" dump height.</p>
<p>For stability safety, the water tanks shall not elevate with debris body during dump cycle.</p> <p>This is a safety issue when emptying the truck on uneven surfaces (easements). When the water tanks' rise with the debris body it increases the enter mass of the vehicle, making it less stable. Truck tipping hazard.</p>	<p>The water tanks are fixed to the sides of the debris body and rise with the debris body while dumping.</p> <p>Non-compliant with specification.</p>
<p>Body shall have a float type automatic shut-off system protecting the Positive Displacement Blower with (2) 10" stainless steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out</p>	<p>Only single ball float, instead of dual ball float.</p> <p>Non-Compliant with specification.</p>

Bid Spec Requirement	Donovan Equipment
<p>screen assembly and be accessed without the use of tools.</p> <p>This is a protection for our blower equipment on the truck. It stops the system from continuing to vacuum and potentially pulling water or debris into the blower assembly.</p> <p>Duel ball floats help protect system when truck is positioned on any sloped surface. A single blower would cost \$10,000 to replace. In this situation, repair of a blower is highly unlikely.</p>	
<p>Industrial style rear debris body door shall be flat, and shall open and close hydraulically by cylinders mounted at the top of the body.</p> <p>The flat door is important for taking up less space for indoor parking required for cold weather storage. The garage where the vehicle is parked has very little clearance.</p>	<p>Rounded rear door, take up additional indoor storage space. Adds an additional foot or more to the length of the vehicle.</p> <p>Non –compliant with specification.</p>
<p>Vacuum hose shall be designed for front operation with hose mounted and stored at front mounted work station. Front mounted location is required for ease of positioning vacuum hose as well as minimizing need for operator to swing hose into traffic.</p> <p>This is critically important for off road driving. Driving forward is much safer than driving in reverse.</p>	<p>Does not meet requirement. Vacuum hose and jet system designed for rear operation.</p>
<p>A minimum 6" connection between tanks shall be provided.</p> <p>This is important for the proper and efficient filling of the fresh water system as well as water being supplied to water pump.</p>	<p>Only 4 inch connection between tanks. Takes longer for tanks to equalize during filling, and is slower to supply water volume to pump.</p>

Reference Checks

The Town contacted the references for the Camel listed in the bid and also visited Saco Maine to inspect their in-service Camel and discuss their experience with the truck. The fleet manager and the truck operator both were satisfied with the truck and stated that has operated without significant issues since purchased since the summer of 2019. The truck is on the road Monday thru Friday and provides service for both catch basins and sewer lines.

Recommendation

The Wastewater Treatment Plant is therefore recommending the purchase of the Camel Sewer Truck for \$377,129. Attached are copies of all the bids submitted.



## TOWN OF MERRIMACK, NEW HAMPSHIRE

### FINANCE DEPARTMENT

6 Baboosic Lake Road  
Merrimack, NH 03054

Tel: 603-424-7075

Fax: 603-424-0461

### Combination Sewer Cleaner Truck for Waste Water Treatment Facility Bid Form

Due by 2:00PM on Tuesday, November 24, 2020

Combination Sewer Cleaner Truck, according to the Town's  
Bid specifications

\$ 399,729.00

Mfg & Model: SuperProducts Camel Maxxx 12yd

Allowance for Trade in

( \$ 30,000.00 )

Total price: \$ 369,729.00

Warranty: See Attached Docs

Enclosed:

Warranty information

Detailed specifications on equipment

The above bid is provided in accordance with the Town of Merrimack's bid invitation dated November 2, 2020 except as indicated below:

Bidder: HP Fairfield  
Street Address: 554 Maple Street  
City, State, Zip Code: Hopkinton NH 03229  
Phone No: 603-722-8106 Fax No: N/A  
Authorized Signature: [Signature]  
Printed Name: Michael Kaubach  
Email: michael.kaubach@HPFairfield.com Date: 11/23/20



# TOWN OF MERRIMACK, NEW HAMPSHIRE

**FINANCE DEPARTMENT**  
**6 Baboosic Lake Road**  
**Merrimack, NH 03054**

**Tel: 603-424-7075**  
**Fax: 603-424-0516**

## BID SPECIFICATIONS COMBINATION SEWER CLEANER TRUCK

<b>INTENT</b>		
The intent of this specification is to provide for the purchase of one (1) new and unused single-engine combination sewer and catch basin cleaner used for removing all debris commonly found in catch basins/storm lead structures and sanitary sewer lines/manhole structures using a front mounted operating station. The unit shall consist of a Positive Displacement (PD) Blower vacuum system, a hydraulically driven high pressure water pump, an enclosed sealed body for storage of collected debris and equipped with a self-contained water supply as the source for the water pump system. The unit shall have the capability of operating both vacuum and water system simultaneously at full operating speeds continuously. (Submit horsepower requirements of all systems on unit)		
<b>EQUIVALENT PRODUCT</b>		
Bids will be accepted for consideration on any make or model that is equal or superior to the equipment specified. Decisions of equivalency will be at the sole interpretation of the Merrimack NH Sewer Purchasing and Public Services Director.		
Bidder shall demonstrate a reasonable likeness of the equipment being offered within a reasonable time of request. Equipment demonstrated shall be equipped with all accessories and components required in this specification to ascertain equivalence.		
A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence. Original manufacturer's brochures of the proposed unit are to be submitted with the proposal.		
<b>BIDDER REFERENCES</b>		
To ensure adequate local availability of parts and competent service from experienced suppliers, bids are preferred from local vendors who have sold and serviced at least 30 units of same manufacturer within service area of Merrimack NH Sewer and should include contacts with phone numbers.		
<b>SERVICE AND SUPPORT</b>		
Location of warranty service center and amount of inventory shall be noted which may be verified and inspected.		
Amount of OEM parts at this facility: this information to be included with bid package submittal.		
Years of servicing equipment being bid: this information to be included with bid package submittal.		
Number of factory qualified service technician: this information to be included with bid package submittal.		
<b>GENERAL</b>		
The specification herein states the minimum requirements of the Merrimack, NH Sewer. All bids		

must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. Any bid not prepared and submitted in accordance with the bid document and specification, or any bid lacking sufficient technical literature to enable the Merrimack NH Sewer to make a reasonable determination of compliance to the specification will be considered "non-responsive" and grounds for rejection.	Comply	
<b>SUBFRAME</b>		
The equipment shall be of modular design consisting of vacuum system, water tanks system, debris body and drive system.	Comply	
A sub frame shall be fabricated to the exact dimensions of the truck chassis for mounting of modular components.	Comply	
All components of the module shall attach to the sub frame and not directly to the chassis.	Comply	
Sub frame shall be designed to ASME standards for maximum applied loads, chassis frame movement and even distribution of weight to the chassis and suspension.	Comply	
Sub frame shall be continuous and uninterrupted from back of cab to end of frame.		
<b>DEBRIS BODY</b>		
Efficiency of air movement through debris body will be measured for minimal restriction as measured by vacuum pressure gauge while operating blower at full speed. Pressure drop throughout entire system (from 8" hose inlet to blower inlet) including specified filtration and blower protection devices shall be no greater than 3" hg as measured at blower.	Comply	
The body shall be cylindrical having a minimum usable liquid capacity of 12 cubic yards.	Comply	
The body shall be capable of high dump height of 60". Dump height of 60" must be achieved without the use of scissor lift mechanism.	Comply	
The debris storage body shall be constructed with a minimum 1/4" corrosion and abrasion resistant steel.	Comply	
The debris storage body shall have a minimum yield point of 50,000 PSI and a minimum tensile strength of 70,000 PSI.	Comply	
Body shall have a rear door that is hinged at the top and is equipped with a replaceable type seal. Adjustable for periodic compensation of door seal wear.	Comply	
Dual outward mounted rear door props shall be included as standard to prevent operator from entering door swing path when engaging rear door prop.	Comply	
For optimal particulate separation, vacuum shall be drawn from separate ports in the top of the debris body.	Comply	
Body shall be dumped by raising the body to a 50 degree angle utilizing a forward mounted, double acting hydraulic dump cylinder.	Comply	
Dump controls, accessory controls, e-stop control shall be provided at a central curb side location directly behind the cab of the truck.	Comply	
For stability and safety, dumping must be accomplished while the pivot point of the body remains fixed to the subframe.	Comply	
Industrial style rear debris body door shall be flat, and shall open and close hydraulically by cylinders mounted at the top of the body. Door shall open 50 degrees from the fully closed position. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body, so operator is not subject to sewage when dumping.	Comply	
Debris body shall have a body flush out system with a fan-type spray nozzle located in the front wall of the debris body to aid in the flushing of heavy debris. The nozzle shall also utilize (2) spray nozzles to flush the front most area of the debris body. System must produce a flow of 80GPM. Control valve shall be on the curb side of the unit.	Comply	
Body shall have a float type automatic shut-off system protecting the Positive Displacement Blower with (2) 10" stainless steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out screen assembly and be accessed without the use of tools. <b>NOTE (1) 10" stainless steel shut-off balls – Have found dual system to hang up.</b>	NOTE	



The water tank shall be located for the lowest possible center of gravity while providing 100% gravity flooded intakes to water pump.	Comply	
Fresh water shall enter the tanks through an in line 6" air gap, all aluminum covered anti-siphon device.	Comply	
Water level sight tubes of non-yellowing plastic shall be installed on both tanks.	Comply	
The sides of these water tanks shall not extend more than 48" out from the centerline of the truck chassis.	Comply	
A fresh water drain system shall be provided to completely drain the fresh water system from one location utilizing the 3" Y-strainer.	Comply	
A minimum 6" connection between tanks shall be provided.	Comply	
For stability safety, the water tanks shall not elevate with debris body during dump cycle. <b>Note, tanks raise with body.</b>	Note	
An air purge system utilizing the chassis air system shall be provided to assist displacing of residual water out of the high-pressure water system. System shall utilize the truck chassis air compressor to fill a 13-gallon auxiliary air storage chamber with pressure gauge and pressure protection valves to isolate the holding tank from the chassis compressor. System shall be equipped with ball valve and all necessary high pressure piping hoses, couplings and controls.	Comply	
A 3 in-line "Y" trap strainer shall be located at inlet of water tank fill air-gap.	Comply	
A 3 in-line "Y" trap stainless steel strainer shall be located between the water cells and water pump.	Comply	
A Gate Valve shall be provided at water pump.	Comply	
Water tank must be a certified metered capacity of 1300 gallons, at a minimum. Certification shall be necessary upon delivery. <b>Note: 1500 gallons.</b>	Note	
Water tanks shall be constructed of 1/8" aluminum with baffled compartments maximum 150 gallons each. Or other equivalent material. <b>Note 250 gallon, poly.</b>	Note	
Liquid Float Level Indicator shall be provided.	Comply	
<b>WATER PUMP SYSTEM</b>	Comply	
For most efficient use of horsepower and reduced fuel consumption, high pressure rodder pump shall be hydraulically driven via (2) variable displacement pumps	Comply	
Hydraulic powered rodder pump via (2) variable displacement hydraulic pumps utilizing (2) 10-bolt PTO's.	Comply	
High pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI (submit manufacturer support documentation).	Comply	
High-pressure water (rodder) pump system shall be completely controlled through the range with use of the onboard computer controlled system. Control and throttle located on the control panel.	Comply	
Digital flow meter shall be displayed in front LCD display. Flow meter shall be capable of displaying system flow in all pump operating modes. In addition, a low water alarm shall be provided.	Comply	
Water pump speed to remain fully adjustable via an independent operator input regardless of the selected vacuum drive speed.	Comply	
Variable flow systems routing water back-to-tank are not considered equal due to additional wear, horsepower and fuel consumption. Any deviation from this drive requirement should have full explanation of horsepower consumption.	Comply	
Water (rodder) pump shall include smooth and pulsation operation mode feature without altering pump flow.	Comply	
When required to assist nozzle breaking through obstructions, water pump "pulsation mode" shall provide a forward-acting nozzle surge. Pulsation surge wave shall allow nozzle to punch forward 2" to 18" depending on flow dynamics and length of hose in sewer pipe.	Comply	
Explanation of forward-acting pulsation method shall be submitted with bid or explained below. Systems that require the use of air induction into the water pump shall not be accepted.	Comply	
Water pump location shall provide a flooded gravity suction inlet to eliminate potential cavitation damage.	Comply	
An oil to water heat exchanger will be provided in the water system to cool all hydraulic fluids on the unit. State horsepower requirement to operate hydraulics at full speed:	Comply	

The debris body shall be equipped with a rear door drain to drain off excess liquids while retaining solids and shall include a manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects.	Comply	
The debris body shall be equipped with a rear door drain at bottom dead center to drain off excess liquids with an internal screen to prevent large solids from passing. A manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects shall be included at this location.	Comply	
Vertical (cyclone) centrifugal separators shall be installed in-line between the debris body and the air mover, for each debris body discharge port. Each separator shall include large fallout chamber cleanout door. <b>Note: Vertical (cyclone) centrifugal separator (Single) shall be installed is larger and mounted in ft off body for better separation.</b>	NOTE	
For safety, a minimum of (5) vacuum tubes shall be stored on curbside storage racks to minimize operator exposure to traffic side of unit. Shall include quick release retainer handles (no bungees or clamps).	Comply	
A curb-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps). <b>Note - Tailgate</b>	NOTE	
A street-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps). <b>NOTE: Find Mt tube racks on street-side to be safty issue ,with tube racks provide unit hold 45' tube.</b>	NOTE	
A rear door mounted folding 2-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).	Comply	
(2) Pipe Storage Racks on rear door with quick releases and (2) Pipe Storage Racks Curbside waist level.	See Above	
A stainless steel micro-strainer (to 30 microns) shall be provided prior to the blower inlet, with (3) removable cartridge style screens and bottom drain port. Or equivalent filtration system. <b>Note: Pleated filter (10 microns).</b>	NOTE	
A splash shield shall be mounted around the lower 60% of door opening to direct liquid and debris away from the chassis. Shield shall be minimum 10" deep bolted assembly with no openings.	Comply	
A lubrication manifold system shall be provided to allow ground level greasing of boom lift and swing cylinders, float level indicator, top rear door hinges and debris body hoist cylinder pins.	Comply	
A plastic lube chart shall be provided to call out when specific points on the unit should be greased.	Comply	
A 6" valve, electrically activated, air operated valve debris body vacuum relief system shall be located in the inlet of the vacuum system to allow the venting of the tank and relieve vacuum at the debris intake hose.(3) Kunkel relief valves shall be included.	Comply	
A debris inlet deflector distributing load evenly in debris body shall be included.	Comply	
<b>WATER TANKS</b>		
The water tanks shall be manufactured from a non-corrosive material to prevent rust yet still provide for maximum strength.	Comply	
The water tank material shall require no internal coating and shall be repairable if patching is required.	Comply	
The water tanks shall be easily removed from the subframe to provide complete access to the truck chassis for maintenance purposes.	Comply	
The water tanks shall be adequately vented and connected to provide complete filling.	Comply	
The water tanks shall be totally separate from the debris tanks and provide no structural support.	Comply	
The water tanks shall share no common walls with the debris tanks to prevent corrosion.	Comply	
The water tanks shall come equipped with an anti-siphon device and 25' of hydrant fill hose and fittings.	Comply	
The water tanks shall carry a 10 year warranty against corrosion or cracking at a minimum.	Comply	
All water tanks shall be fully baffled to form a maximum compartment storage of 150 gallons for each compartment. Merrimack NH Sewer has determined that for the stability of the vehicle when turning and stopping and for safety of personnel that systems baffled at 150 maximum gallon compartments are preferred. Exceptions of requirement shall be explained in detail accompanied with detailed engineering drawings. <b>Note: 250 gallon.</b>	Note	

The water pump shall provide precise 0-80 GPM controlled flow at variable pressure up to 2500 PSI.	Comply	
An extreme cold weather recirculation system - minimum 25 GPM via transmission PTO at chassis engine idle speed. <b>Note - 40 GPM</b>	Note	
A hydro-pneumatic nitrogen charged accumulator system shall be provided with all control valves, piping and hoses for either continuous flow or jackhammer rodding. Accumulator shall be a 2.5 gallon capacity and 1000 to 2500 PSI pressure rating. <b>Note - Dual accumulators.</b>	Note	
Two (2) 1/2" high pressure ball valves shall be provided for draining the water pump and flushing sediment from the bottom of the pump.	Comply	
A nozzle rack accommodating (3) nozzles shall be provided in curbside toolbox. The nozzles shall be labeled on storage rack for pipe size/flow and application. Note - Cube-side tool box System shall be relieved to protect operator.	Note	
Handgun shall be supplied that allows for changing of flow pattern from a fine mist to a steady stream.	Comply	
Handgun shall come equipped with quick connect couplers.	Comply	
An additional 1" water relief valve shall be provided.	Comply	
A mid-ship quick disconnect handgun couplers shall be provided.	Comply	
Front and rear quick disconnect handgun couplers shall be provided.	Comply	
Hydro-Excavation Package - Includes Lances, Nozzles, Storage Tray, and Vacuum Tubes.	Comply	
Water system shall allow precise variable flow control range of 0-22 GPM at 2500 PSI with digital flow meter in clear view of adjustment control.	Comply	
A water pump hour meter shall be provided.	Comply	
A high-pressure hose reel capable of operating at system pressure shall be provided.	Comply	
Minimum of a 1,300 gallon fresh water capacity. <b>Note - 1500 gallons</b>	Comply	
<b>VACUUM/VACUUM DRIVE SYSTEM</b>		
Vacuum shall be provided by a positive displacement rotary lobe type blower driven via chassis engine and heavy duty split transfer case direct to the blower.	Comply	
Interlock safety system shall prevent drive axle from engaging.	Comply	
A horizontal silencer with rain cap shall exhaust above the cab.	Comply	
A blower tachometer / hour meter shall be provided and displayed digitally on front control screen.	Comply	
For most efficient use of horsepower and fuel consumption, full vacuum and/or combination operation shall be approximately 1750 RPM of chassis drive engine.	Comply	
Blower shall be driven by the chassis engine and shall produce inlet volume of 4500 cfm @ 0" hg @ 2250 rpm, and 3490 cfm @ 18" hg @ 2250 rpm vacuum (Roots 824RCS 18 or equal). Drive engine not to exceed 1760 RPM.	Comply	
For added protection, the vacuum system shall have three (3) relief valves set at 18" hg, heavy duty horizontal mounted noise muffler, removable and cleanable filter screen, and shall be enclosed with a steel cage guard for safety.	Comply	
Transfer case shall be activated by air via a one touch control located in cab with animated confirmation on screen. <b>Note: Blower activation at Ft control panel.</b>	Comply	
A hot shift blower drive system shall be provided, including transfer case, air shift control, vacuum relief, and front control for blower engagement.	Comply	
Blower shall be driven from chassis engine via the transmission drive shafts and heavy duty split shaft transfer case direct to blower, engagement via one touch control on front control panel.	Comply	
The blower drive mechanism shall be engaged and disengaged via an electrical switch located at the operator's station on the front mounted hose reel. This feature shall reduce blower runtime and to extend the blower service life.	Comply	
Blower shall be provided with a horizontal silencer with exhaust above the cab and rain cap protecting the silencer from rain water.	Comply	
Blower shall draw air from two (2) separate ports in the debris body. <b>Note Single, better vacuum.</b>	Note	
Hydraulic shut off valves shall be provided at the suction, return and filter lines to permit servicing of the hydraulic system.	Comply	

<b>VACUUM BOOM SYSTEM</b>			
Vacuum hose shall be designed for front operation with hose mounted and stored at front mounted work station. Front mounted location is required for ease of positioning vacuum hose as well as minimizing need for operator to swing hose into traffic.	Comply		
All connections between debris body and vacuum system will be of the self-adjusting pressure fitting type.	Comply		
Vacuum hose will remain stationary and not rise with debris body.	Comply		
Upper debris tube shall consist of an anchored steel tube and elbow.	Comply		
A sub-frame mounted cab guard shall be mounted behind cab with boom rest cradle.	Comply		
All vacuum pipes shall be connected to vacuum pick up tube and extension pipes by adjustable over-center quick clamps to join the aluminum flanges on pipes.	Comply		
One (1) quick clamp for each pipe supplied shall be provided.	Comply		
Boom pedestal shall be directly mounted to module subframe.			
Boom support used for travel mode shall not interfere with access or require removal to tilt hood forward.	Comply		
A control station shall be equipped with a control joystick for all directions as well as a safety emergency shut-down button, which shall automatically eliminate power to boom.	Comply		
The vacuum boom shall have a heavy-duty flexible hose assembly joining the transition pipe to the debris body, and a 70-degree elbow and 5-1/2 heavy duty hose at the suction end of the boom.	Comply		
Boom shall rotate 180 degrees and shall be operated by an electric over hydraulic system. Lift and swing movements shall be actuated by hydraulic cylinders. <b>Note 225 Degree</b>	Note		
The horizontal inner steel vacuum tube and inner box beam boom section shall telescope (tube within tube, box beam within box beam) and retract a minimum of 10' without affecting the vertical position of the pick-up tubes, and shall be located at the front work station in its retracted position, providing 324" maximum reach off the longitudinal axis of unit. <b>Note: We have heard of many Customers having issues with this system, from wear of many parts to debris plugging the system.</b>		No	
A joystick for hydraulic control of the boom shall be installed on hose reel front panel.	Comply		
A removable 4" diameter storage "Post" to stabilize the lower boom hose during transport. Storage device shall not interfere with raising hood.	Comply		
A cordless remote boom control system equipped to activate boom functions, throttle, water pump on/off, hose reel in/out, hose reel speed, vacuum relief on/off and emergency disengagement e-stop shall be provided.	Comply		
A rotatable inlet hose for telescopic boom shall be provided.	Comply		
A detailed engineering drawing must be supplied showing the relationship of the hose reel in relation with the vacuum boom range of motion. Drawing shall show module mounted on chassis, full arc of vacuum hose both retracted and extended, full rotation of arc for hose reel in the extended position and dimension all arc lengths of vacuum boom retracted and extended. Drawing shall highlight intersection areas whereby combination cleaning is possible (within full arc on telescoping boom system).	Comply		
Unit must be capable of a lift of 35' of sewer flow (including liquids, rags, grease, and other solids)	Comply		
<b>HOSE REEL</b>			
Hose reel assembly shall be direct frame mounted.	Comply		
Hose reel assembly shall be mounted on an independent frame that can be removed from brackets attached permanently to front of main truck frame members.	Comply		
Reel will be manufactured out of 1/4" spun steel for added structural strength and shall require no internal or external reinforcements that could damage rodder hose.	Comply		
Hose reel shall be driven by adjustable gear reduction chain and sprocket assembly.	Comply		
Hose reel shall operate at full rotational speed while chassis engine is at idle.	Comply		
Hydraulic Telescoping Rotating Hose Reel - 800' capacity of 1" hose shall be provided. <b>Note, 1000 capacity of 1" hose.</b>	Note		
The front mounted hose reel shall telescope 15" forward down centerline of truck. <b>Note, 18" forward down centerline</b>	Note		
Entire reel assembly shall rotate 270 degrees on a large diameter ball bearing.	Comply		
Hose reel shall include a dual locking device to positively lock reel in any position across	Comply		

operating range.	Comply	
The hose reel shall rotate about the reel assembly centerline so the reel shall never extend beyond the truck width. Reel coverage diagram shall be submitted with bid.	Comply	
Controls shall accessible on both sides of the hose reel via a mounting station for the wireless remote control, allowing operator to work at either side of unit for safety purposes.	Comply	
800' x 1" Piranha Sewer Hose / 2500 Psi shall be provided	Comply	
An automatic hose level wind scroll device shall be supplied. An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages.	Comply	
An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages. Pinch roller must be activated via a one touch, backlit button with lighted feedback on the control panel.	Comply	
Digital footage counter displaying footage values shall be provided. System must be capable of resetting value to ensure operator safety. Accuracy To Within One Percent Of Actual Distance, Large Easy To Read Lcd Screen located on the front control panel screen.	Comply	
10' Leader Hose	Comply	
<b>WASHDOWN EQUIPMENT</b>		
A handgun with 1/2" x 35' hose shall be provided at mid-ship to which allow the operator to deliver water to area served by pick up hose and to the inside of the debris body for clean out.	Comply	
Hand sprayer with adjustable spray-pattern to be provided with trigger-style gun.		
<b>FRONT OPERATING STATION AND CONTROLS</b>		
Primary operator station will be located at front of hose reel.	Comply	
All operator controls should be located on a single control panel that can be rotated on a 90 degree arc for an operator customizable location. The control panel shall also feature the ability to raise and lower to accommodate operators of different height.	Comply	
Station shall include a 7" Touch enabled display screen with corresponding tactile buttons for reading critical machine data including ( hose footage, hose reel speed settings, water pressure, water flow. Air mover information, chassis data, mode indicator, chassis fuel level, and diagnostic controls), Back lit button keypads with, laser etched function icons, and 4 light feedback indicators. These buttons shall operate the following functions: All setup functions (remote/panel selector, work lights, hose reel extend/retract, hose reel lock, and pinch roller activation) and Vacuum functions. Additionally, there will be separate sealed rocker switches for Water Pump on/off and Throttle up/down. There shall be a multi flow control dial for controlling the full range of the water pump.	Comply	
There shall be a hose reel joystick to control the pay in and pay out of the hose reel, this joystick shall offer speed control that increases the further the joystick is moved in either direction. There shall be an additional hose reel speed dial for setting specific speed ranges of the reel. There shall be a boom joystick that controls all function of the boom including up/down, left/right, and extend/retract. There shall be a E-Stop button to bring the machine to safe operating condition	Comply	
Tachometer and hour meter for chassis engine provided at control station shall be provided.	Comply	
Tachometer and hour meter for blower provided at control station shall be provided.	Comply	
All Hydraulic Functions - Color Coded, Sealed Electric/Hydraulic NEMA 4 switches shall be provided.	Comply	
Blower Engagement/Vacuum Relief - Sealed Electric/Air NEMA 4 Switch shall be provided.	Comply	
Water pump hour meter shall be provided.	Comply	
PTO hour meter shall be provided.	Comply	
A temperature light and alarm shall be provided. Light and alarm will be activated when hydraulic temperature reaches 180 F.	Comply	
Front control screen shall display a water level indicator to show level of water through the range of the tank.	Comply	
Front control screen shall display the debris body level.	Comply	
<b>IN CAB CONTROLS</b>		
All In cab controls are to be located on a single in cab control screen. This shall be a full color	Comply	

display screen. It shall utilize 12 back lit tactile (glove ready) buttons on the sides of the screen as well as feature touch screen operation.	Comply	
All Back up camera Features shall be displayed on the In Cab Control Screen.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Comply	
All standard arrow boards or arrow stick shall be controlled via an on screen controller	Comply	
All safety strobes and beacons shall be controlled via on screen controller	Comply	
Jet or Combo mode shall be activated via one touch button on the control panel. Control screen must display an on screen representation of the chassis drive system and must animate to show as drive systems activate or deactivate.	Comply	
Recirculation must be activated on the in cab control screen and visibly show that it is active at all times.	Comply	
<b>ELECTRICAL &amp; SAFETY LIGHTING</b>		
The entire system shall be vapor sealed to eliminate moisture damage, "Nema-4" type or equal.	Comply	
Logs, reports, and hour meters will be accessible via the display.	Comply	
All electrical connections shall be void of exposed wires or terminals nor should they be painted. Paint process shall be completed prior to installation of wiring.	Comply	
All wiring shall be color-coded and encased in conduit to scaled terminal boxes with circuit breakers.	Comply	
All other lights required by State and Federal Laws.	Comply	
One-piece directional 10-light arrow board (Signal Master or equal) shall be mounted on rear door of debris body, with controls mounted in cab.	Comply	
Handheld, Pistol Grip LED Spot light with rechargeable Lithium Ion battery.	Comply	
Operator station shall have back lit buttons for low light operation.	Comply	
Hose reel manhole work lights shall be provided	Comply	
(2) L.E.D. Boom work lights shall be provided.	Comply	
L.E.D. Work light at midship curbside shall be provided.	Comply	
L.E.D. Work light at midship street side shall be provided.	Comply	
(2) L.E.D. Rear door work lights shall be provided	Comply	
L.E.D. Lights, Clearance, Back-Up, Stop, Tail & Turn shall be provided.	Comply	
Mid-Ship L.E.D Bubble Type Turn Signals Shall be Provided	Comply	
<b>SAFETY EQUIPMENT</b>		
E-stop shall be located at each operator interface location. Standard locations to include: front hose reel, mid-ship curbside dump controls, & wireless controller (if equipped.)	Comply	
Electrical system controls shall be configured to allow for single point operation only. Upon engagement of controls at specified locations, additional controls shall be disabled.	Comply	
Electrical system must enable self-check to ensure all switches are in home position prior to critical function enablement. System must "lock out" controls when switch is not in home position.	Comply	
Rear work lights shall be activated upon engagement of reverse gear.	Comply	
(1) Emergency Flare Kit	Comply	
(1) 5# Fire Extinguisher.	Comply	
7" dash monitor, 2-camera system shall be provided. A Front Hose Reel Color Camera with 130 degree Viewing Angle shall be provided to provide a front visual of the manhole cover to aid in equipment set-up. A rear back-up color camera with 130 degree viewing angle shall be provided. Camera to have automatic activation when the unit is switched to reverse.	Comply	
The unit shall utilize a high temperature monitoring safety device to automatically disable the vacuum system when the outlet temperature of the positive displacement blower reaches a high temperature limit.	Comply	

Digital water pressure shall be displayed in front LCD display. Pressure gauge shall be capable of displaying water system pressure in all pump operating modes.	Comply	
<b>SEWER TOOLS AND ACCESSORIES</b>		
(1) 30 Sand Nozzle	Comply	
(1) 30 deg. Sanitary Nozzle	Comply	
(1) 15 deg. Penetrator Nozzle	Comply	
(1) 1" Small finned nozzle pipe skid	Comply	
<b>VACUUM TOOLS AND ACCESSORIES</b>		
The basic vacuum tube package shall include the following:		
(1) 8" x 3' aluminum pipe	Comply	
(2) 8" x 5' aluminum pipe	Comply	
(1) 8" x 6'6" catch basin tube	Comply	
(4) 8" quick clamps	Comply	
<b>CHASSIS EQUIPMENT AND STORAGE</b>		
Two (2) front tow hooks shall be provided.	Comply	
Two (2) rear tow hooks shall be provided.	Comply	
A safety cone storage rack shall be provided to contain safety cones in the inverted position.	Comply	
Aluminum Toolbox - Behind Cab	Comply	
(1) 18" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided. <b>Note 22x14x60</b>	Comply	
(1) 48" x 22" x 24" Aluminum Toolbox Mounted curb side shall be provided. <b>Note 10x18x48</b>	Comply	
(2) 18 in. x 16 in. x 12 in. Aluminum Toolbox - Front Bumper shall be provided. <b>Note curb side 36"</b>	Note	
(1) 60" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided. <b>Note 18x18x48 Curb side safety</b>	Note	
(4) Long Handle Tool Storage Locations Behind Cab shall be provided	Comply	
<b>MODULE FINISH</b>		
Painting of the module shall be with a DuPont Imron Elite Polyurethane Enamel Top Coat. Application is to be a wet top coat applied to a dried and sanded primer base. <b>Powder Coat Surface prep material with steel shot blast Grit G-80. Wash, Rinse &amp; surface etch with Iron Phosphate, Rinse, dry &amp; seal. Powder Coat Industrial Coating TGIC Super Durable, 4ml thick average with a Finish of 80+Gloss rating @60 degrees.</b>	Note	
<b>CHASSIS SPECIFICATION</b>		
The unit shall be a new model. No discontinued models will be accepted	Comply	
Freightliner 114SD Conventional Cab Chassis	Comply	
The unit shall be equipped with a diesel engine, turbo charged and after cooled, with a Detroit Diesel 13 12.8L; 435 HP @ 1800 RPM, 1650 LB/FT @ 1100 RPM <b>Note: 450HP</b>	Comply	
Set Forward Axle	Comply	
The unit shall be equipped with an Allison 4000 RDS Automatic Transmission with PTO Provision	Comply	
The unit shall be equipped with a Meritor MFS-20-133A 20,000# Wide Track, I-Beam Type Single Front Axle	Comply	
The unit shall be equipped with a 20,000# Flat Leaf Front Suspension	Comply	
The unit shall be equipped with a Meritor RT-46-160P 46,000# R-Series Tandem Rear Axle <b>Note 40,000# Rears - HENDRICKSON RT403 @40,000#</b>	Note	
The unit shall be equipped with a 46,000# Hendrickson RT463 Rear Suspension <b>Note 40,000# Rears - HENDRICKSON RT403 @40,000#</b>	Note	
The unit shall be equipped with a 114 inch BBC flat room aluminum conventional cab	Comply	
The unit shall have a wheelbase of 277 inches	Comply	
The unit shall have a 7/16 x 3-9/16 x 11-1/8 inch steel frame with 120 KSI rating	Comply	
The unit shall have a 1/4 inch C-Channel inner frame reinforcement	Comply	
The unit shall have a 71 inch rear frame overhang	Comply	
The unit must be capable of fuel dosing of after treatment enabled in PTO mode-cleans hydrocarbons at high temperatures only.	Comply	
Unit must be equipped with air actuated rear axle lockers on one switch, and inter axle cross locking on other switch, to lock in both of the tandem axles (DCDL/IAD)	Comply	
The unit must be compliant with all DOT and FMCSA regulations.	Comply	
<b>ADDITIONAL PARTS</b>		
(1) 8" x 3' Aluminum Vacuum Tube	Comply	

(1) 8" x 5' Aluminum Vacuum Tube

Comply



(1) 8" x 7'-6" Aluminum Vacuum Tube	Comply	
(1) 8" x 78" Higbee C/B Nozzle Assembly	Comply	
(6) 8" Quick Clamp Assembly	Comply	
(1) 8" Adjustable Air Adapter	Comply	
(1) Flexible Hose Guide	Comply	
<b>DEALER</b>		
Equipment dealer must be within 40 miles of Merrimack Water Treatment facility.	Comply	
Equipment dealer must have road trucks available for travel to customer's site	Comply	
Parts must be in stock at dealer's location, and on occasion from manufacturer within 48 hours	Comply	
Equipment dealer must have been representing offered product for over 20 years		
Dealer must have over 50 units of the model offered out in the field		
<b>Warranty</b>		
Extended warranty on emissions system pricing to be included in bid package (pricing for all warranty periods offered to be included with bid package.)	Comply	
Warranties to be included in bid package on all aspects of Unit. Listed out in indivual line items for clarity.	Comply	
<b>Training</b>		
Training in the operations and maintenance of the unit to be included.	Comply	



**NEW HAMPSHIRE**  
 554 Maple Street  
 Hopkinton, NH 03229  
 P: (603) 225-9576  
 F: (603) 228-5246

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<b>CUSTOMER NO</b>	826536	<b>TERRITORY</b>	393	<b>PAGE 1 of 4</b>
<b>ORDER DATE</b>	11/23/2020	<b>CUSTOMER PO</b>	79328Kaulbach	
<b>QUOTE DATE</b>	01/21/2021	<b>SHIPPED VIA</b>		
<b>SALES ORDER</b>	5914307 - SQ	<b>FREIGHT TERMS</b>	EXW- CUSTOMER FRT ACCOUNT	
			EX2 DIRECT BILL TRANSER AT ORIGIN	
<b>PAYMENT TERMS</b>	Net 30 Days from Invoice Date		<b>CODE</b>	002
<b>DELIVERY INSTRUCTIONS:</b>				
		<b>REQUESTED SHIP DATE</b>	11/23/2020	

**SOLD TO:**  
 TOWN OF MERRIMACK CHP  
 80 TURKEY HILL RD  
 MERRIMACK NH 03054-4024

**SHIP TO:**  
 TOWN OF MERRIMACK CHP  
 80 TURKEY HILL RD  
 MERRIMACK NH 03054-4024

DESCRIPTION/REMARKS
<p>DUMP TYPE CAMEL MAXXX / 12 YD (9.2m) COMBINATION SEWER CLEANER            Chassis ? 2020 Freightliner 114SD Detroit DD13 450 Horsepower, Allison 4000 RDS Auto, 46k rear end, 12 yard body.</p> <p>STANDARD COMPONENTS            Hydraulic powered open and close, full height and width flat rear door            Four (4) mechanical, wedge pin and receiver, hydraulically operated tailgate latches Exterior            mechanical liquid level gauge with stainless steel float and rod            Body raised with a two stage double acting telescopic cylinder  <b>--EJECTOR STYLE WITH SIDE DRAIN, KNIFE VALVE AND DECANT HOSE</b></p> <p>Internal debris tank flushing system            Vacuum pump direct shaft driven from a heavy duty transfer case            Blower engagement from front control panel            An externally mounted, vertical cyclone separator with a 16" diameter clean out (ceramic coated as discussed via conference call on 1/20.            Separate bill to be issued for coating)            Drip tube to be added to cyclone separator at dealer            Vacuum relief vent door to automatically relieve vacuum            Water storage tanks 1500 gallon usable capacity            Rotational molded non-cross linked polyethylene construction with ultraviolet stabilizer            A single curbside fill system with strainer and 4" air gap            The hose reel assembly front mounted with 270 degree manual rotation            The hose extends 18 inches            The hose reel capacity of 1000' of 1" I.D. sewer hose.            Reel driven by a double chain, hydraulic drive            A containment system enclosing the top ¼ of the hose reel            Self-contained air purge system for purging water to prevent freeze-up            Power boom with 250 degree hydraulic rotation lockable in any position            Boom is equipped with a heavy duty channel reinforced elbow            Joy sticks permanently mounted to the operator control station for boom, hose reel functions            Hydraulic boom extension of 8', true telescoping tube inside of tube design            The operator control center is located at the front of unit            Advanced logic Can-BUS command and control systems network            Self-diagnostic control system            Quarter fenders ? front and back of rear wheels            Safety cone rack complete with 6 - 28" orange cones            Powder coat finish, unit only, white            Rear bumper            Assy, Body, Camel, 12yd, Dump</p>

R E M A R K S	NET DUE	CASH DISC.	IF PAID BY	SUB-TOTAL	377,129.00
	377,129.00	0.00	02/20/2021	FREIGHT & HANDLING	0.00
				SALES TAX	0.00
				TOTAL(USD)	377,129.00
				PREPAID AMOUNT	

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 MERRIMACK NH 03054-4024

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8" vacuum system, "Roots type PD Model 824, 18" hg. and 4500 cfm  
 Pleated final filter assembly  
 VACUUM PUMP HIGH TEMP RELIEF SYSETM  
 Rear splash shield  
 Cover, No Accu-level  
 Cover, 6" Front Drain  
 Rear body drain, 6", knife valve, 10' x 6" fabric drain hose, camlock cap (RIV Valve)  
 Standpipe, Rear drain, vertical asm  
 Baffle, Interior rear door, stainless steel  
 Cover, 3" Tailgate  
 80 GPM @ 2500 PSI  
 Winter recirculation  
 Retractable hose reel with live center with 50' x 1/2" hose  
 Low water warning light and alarm with water capacity digital display  
 Manual Accumulator shut off valve (Standard)  
 Wireless remote  
 Boom Decals, Red w/Black Border (choose qty 2) (standard)  
 800' 1" hose  
 Fully auto power level wind  
 Hose reel tension system  
 Hose reel digital counter (automatic)  
 LED Boom work lights  
 LED Flood light package, tailgate area, power unit area  
 LED Package 2 - (2) Tailgate beacon omni-directional strobe, (2) Boom beacon omni-directional strobe  
 Rear-mounted light bar  
 Lower curbside toolbox 18" x 18" x 48"  
 Curbside toolbox 18" x 18" x 48"  
 Cordless Rechargeable Handheld Work light  
 Driver side toolbox 22"x 14" x 60"  
 Back of cab vertical tube rack  
 Tube Rack, Tailgate, Fold Down  
 Camera system, front  
 Urethane paint finish, white  
 Hydro-X Kit, Bandlock Style (SP Style)  
 Rotor Nozzle  
 3D Cleaning Nozzle  
 Large Chisel Nozzle  
 1" finned nozzle extension  
 Nozzle rack curbside tool box  
 Hose, 25', plastic - Single Jacket Filler Hose

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1/2" dia x 35' Whip hose with quick disconnects  
 Leader Hose 1" x 10'  
 Wash-down handgun  
 Tiger tail Sewer Hose Guide  
 Hydrant wrench  
 Puller hook  
 Front / rear tow hooks  
 2 1/2 pound fire extinguisher (for 1 additional, 1 included with chassis)  
 7" dash monitor, 2-camera system shall be provided. A Front Hose Reel Color Camera with 130 degree & A rear back-up color camera with 130 degree viewing  
 (1) Emergency Flare Kit  
 Behind cab toolbox  
 Toolbox curb-side 18x18x36 opens up  
 Fluidizing Suction Tube Nozzle 8" x 24"  
 Super tube Lock ring 8"  
 Gaskets for Super tube O-ring, Gasket 8"  
 8" X 36" Super tube w/ Crown  
 8" x 36" Super tube ? Aluminum x2  
 8" x 60" Super tube ? Aluminum x3  
 8" x 84" Super tube - Aluminum  
 8" x 96" Super tube ? Aluminum  
 \*\*Flat flange style tubes and clamps  
 One (1) year warranty, unit module on defects in material and workmanship  
 Ten (10) year warranty, on water tanks, defects in material and workmanship  
 Ten (10) year warranty, on debris tank, defects in material and workmanship  
 Three (3) year warranty, on water pump, defects in material and workmanship  
 Two (2) each operation, maintenance and parts manual

PDI - Prep - Deliver to Merrimack

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ITEM NUMBER	BRANCH	DESCRIPTION	PICK SLIP#/ LOT/SERIAL	QUANTITY SHIPPED	LIST PRICE	DISC%	EXTENDED AMOUNT
SEWERHPF	9958	CAMEL MAXXX COMBO		1	407,129.00	0	407,129.00
TRADEINQUOTEHPF	9958	2006 VacCon		1	-30,000.00		-30,000.00

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**TOWN OF MERRIMACK, NEW HAMPSHIRE**

**FINANCE DEPARTMENT  
6 Baboosic Lake Road  
Merrimack, NH 03054**

**Tel: 603-424-7075  
Fax: 603-424-0461**

**Combination Sewer Cleaner Truck for Waste Water Treatment Facility  
Bid Form**

**Due by 2:00PM on Tuesday, November 24, 2020**

Combination Sewer Cleaner Truck, according to the Town's  
Bid specifications

\$ 471,490.00

Mfg & Model: SEWER EQUIPMENT CO.  
MODEL 900

Allowance for Trade in

(\$ 20,000.00)

Total price: \$ 451,490.00

Warranty: ENGINE AND AFTER TREATMENT WARRANTY COVERAGE  
SEWER EQUIPMENT & EXTRA YEAR 3 YRS/100,000 mi  
Enclosed: TOTAL 2 YRS

- Warranty information  
 Detailed specifications on equipment

The above bid is provided in accordance with the Town of Merrimack's bid invitation dated November 2, 2020 except as indicated below:

SHEET

Bidder: J.F. McDERMOTT CORP  
Street Address: 1235 AUBURN ST.  
City, State, Zip Code: WHITMAN MASS 02382  
Phone No: 508.580.9740 Fax No: 508.580.7747  
Authorized Signature: Brian J. Kennedy  
Printed Name: BRIAN J. KENNEDY  
Email: BRAND@JFMCDERMOTT.COM Date: 11/23/20

## Exceptions

- J.F. Mcdermott is 70 miles away from Merrimack WWTP.
- Tank shall be constructed of welded/repairable .50", U.V. stabilized Duraprolene with a ten (10) year factory warranty. The Duraprolene is to be ultraviolet stabilized to prevent material break down. Total tank capacity shall be 1200 gallons of water with two interconnected 600 gallon tanks. The tanks shall be interconnected with a 6" crossover pipe. The baffles in the tank will be constructed of .50" Duraprolene. These baffles will reduce sloshing and distortion by forming internal compartments. Tank bottom will be flat bottom type; pump intake will be located such to allow sediment to settle at tank bottom rather than entering and damaging pump.
- No LCD Computer Screen on front of Hose Reel. All functions are monitored with Analog Pressure and Hydraulic Gauges. 12 Volt wiring, switches and hydraulic levers operate front hose reel.
- All hydraulic functions shall be powered from the engine directly. No power take off's (PTO'S), chassis drive line transfer cases, belt drive/jack shaft power dividers etc.
- System power is provided by twin hydrostatic transmissions, one to supply power to the water pump drive and the second to provide power to the blower drive.

J.F. McDermott has been in business for over 75 years selling and servicing sewer cleaning equipment. Service dept with 2 Techs and service trucks. Parts and equipment in shop; pumps blowers on shelf.





## TOWN OF MERRIMACK, NEW HAMPSHIRE

**FINANCE DEPARTMENT**  
**6 Baboosic Lake Road**  
**Merrimack, NH 03054**

**Tel: 603-424-7075**  
**Fax: 603-424-0516**

### BID SPECIFICATIONS COMBINATION SEWER CLEANER TRUCK

<p><b>INTENT</b></p> <p>The intent of this specification is to provide for the purchase of one (1) new and unused single-engine combination sewer and catch basin cleaner used for removing all debris commonly found in catch basins/storm lead structures and sanitary sewer lines/manhole structures using a front mounted operating station. The unit shall consist of a Positive Displacement (PD) Blower vacuum system, a hydraulically driven high pressure water pump, an enclosed sealed body for storage of collected debris and equipped with a self-contained water supply as the source for the water pump system. The unit shall have the capability of operating both vacuum and water system simultaneously at full operating speeds continuously. (Submit horsepower requirements of all systems on unit)</p>		
<p><b>EQUIVALENT PRODUCT</b></p> <p>Bids will be accepted for consideration on any make or model that is equal or superior to the equipment specified. Decisions of equivalency will be at the sole interpretation of the Merrimack NH Sewer Purchasing and Public Services Director.</p>		
<p>Bidder shall demonstrate a reasonable likeness of the equipment being offered within a reasonable time of request. Equipment demonstrated shall be equipped with all accessories and components required in this specification to ascertain equivalence.</p>		
<p>A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence. Original manufacturer's brochures of the proposed unit are to be submitted with the proposal.</p>		
<p><b>BIDDER REFERENCES</b></p> <p>To ensure adequate local availability of parts and competent service from experienced suppliers, bids are preferred from local vendors who have sold and serviced at least 30 units of same manufacturer within service area of Merrimack NH Sewer and should include contacts with phone numbers.</p>		
<p><b>SERVICE AND SUPPORT</b></p> <p>Location of warranty service center and amount of inventory shall be noted which may be verified and inspected.</p>		
<p>Amount of OEM parts at this facility: this information to be included with bid package submittal.</p>		
<p>Years of servicing equipment being bid: this information to be included with bid package submittal.</p>		
<p>Number of factory qualified service technician: this information to be included with bid package submittal.</p>		
<p><b>GENERAL</b></p> <p>The specification herein states the minimum requirements of the Merrimack, NH Sewer. All bids</p>		

must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. Any bid not prepared and submitted in accordance with the bid document and specification, or any bid lacking sufficient technical literature to enable the Merrimack NH Sewer to make a reasonable determination of compliance to the specification will be considered "non-responsive" and grounds for rejection.		
<b>SUBFRAME</b>		
The equipment shall be of modular design consisting of vacuum system, water tanks system, debris body and drive system.		
A sub frame shall be fabricated to the exact dimensions of the truck chassis for mounting of modular components.		
All components of the module shall attach to the sub frame and not directly to the chassis.		
Sub frame shall be designed to ASME standards for maximum applied loads, chassis frame movement and even distribution of weight to the chassis and suspension.		
Sub frame shall be continuous and uninterrupted from back of cab to end of frame.		
<b>DEBRIS BODY</b>		
Efficiency of air movement through debris body will be measured for minimal restriction as measured by vacuum pressure gauge while operating blower at full speed. Pressure drop throughout entire system (from 8" hose inlet to blower inlet) including specified filtration and blower protection devices shall be no greater than 3" hg as measured at blower.		
The body shall be cylindrical having a minimum usable liquid capacity of 12 cubic yards.		
The body shall be capable of high dump height of 60". Dump height of 60" must be achieved without the use of scissor lift mechanism.		
The debris storage body shall be constructed with a minimum 1/4" corrosion and abrasion resistant steel.		
The debris storage body shall have a minimum yield point of 50,000 PSI and a minimum tensile strength of 70,000 PSI.		
Body shall have a rear door that is hinged at the top and is equipped with a replaceable type seal. Adjustable for periodic compensation of door seal wear.		
Dual outward mounted rear door props shall be included as standard to prevent operator from entering door swing path when engaging rear door prop.		
For optimal particulate separation, vacuum shall be drawn from separate ports in the top of the debris body.		
Body shall be dumped by raising the body to a 50 degree angle utilizing a forward mounted, double acting hydraulic dump cylinder.		
Dump controls, accessory controls, e-stop control shall be provided at a central curb side location directly behind the cab of the truck.		
For stability and safety, dumping must be accomplished while the pivot point of the body remains fixed to the subframe.		
Industrial style rear debris body door shall be flat, and shall open and close hydraulically by cylinders mounted at the top of the body. Door shall open 50 degrees from the fully closed position. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body, so operator is not subject to sewage when dumping.		
Debris body shall have a body flush out system with a fan-type spray nozzle located in the front wall of the debris body to aid in the flushing of heavy debris. The nozzle shall also utilize (2) spray nozzles to flush the front most area of the debris body. System must produce a flow of 80GPM. Control valve shall be on the curb side of the unit.		
Body shall have a float type automatic shut-off system protecting the Positive Displacement Blower with (2) 10" stainless steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out screen assembly and be accessed without the use of tools.		

The debris body shall be equipped with a rear door drain to drain off excess liquids while retaining solids and shall include a manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects.		
The debris body shall be equipped with a rear door drain at bottom dead center to drain off excess liquids with an internal screen to prevent large solids from passing. A manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects shall be included at this location.		
Vertical (cyclone) centrifugal separators shall be installed in-line between the debris body and the air mover, for each debris body discharge port. Each separator shall include large fallout chamber cleanout door.		
For safety, a minimum of (5) vacuum tubes shall be stored on curbside storage racks to minimize operator exposure to traffic side of unit. Shall include quick release retainer handles (no bungees or clamps).		
A curb-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		
A street-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		
A rear door mounted folding 2-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		
(2) Pipe Storage Racks on rear door with quick releases and (2) Pipe Storage Racks Curbside waist level.		
A stainless steel micro-strainer (to 30 microns) shall be provided prior to the blower inlet, with (3) removable cartridge style screens and bottom drain port. Or equivalent filtration system.		
A splash shield shall be mounted around the lower 60% of door opening to direct liquid and debris away from the chassis. Shield shall be minimum 10" deep bolted assembly with no openings.		
A lubrication manifold system shall be provided to allow ground level greasing of boom lift and swing cylinders, float level indicator, top rear door hinges and debris body hoist cylinder pins.		
A plastic lube chart shall be provided to call out when specific points on the unit should be greased.		
A 6" valve, electrically activated, air operated valve debris body vacuum relief system shall be located in the inlet of the vacuum system to allow the venting of the tank and relieve vacuum at the debris intake hose.(3) Kunkel relief valves shall be included.		
A debris inlet deflector distributing load evenly in debris body shall be included.		
<b>WATER TANKS</b>		
The water tanks shall be manufactured from a non-corrosive material to prevent rust yet still provide for maximum strength.		
The water tank material shall require no internal coating and shall be repairable if patching is required.		
The water tanks shall be easily removed from the subframe to provide complete access to the truck chassis for maintenance purposes.		
The water tanks shall be adequately vented and connected to provide complete filling.		
The water tanks shall be totally separate from the debris tanks and provide no structural support.		
The water tanks shall share no common walls with the debris tanks to prevent corrosion.		
The water tanks shall come equipped with an anti-siphon device and 25' of hydrant fill hose and fittings.		
The water tanks shall carry a 10 year warranty against corrosion or cracking at a minimum.		
All water tanks shall be fully baffled to form a maximum compartment storage of 150 gallons for each compartment. Merrimack NH Sewer has determined that for the stability of the vehicle when turning and stopping and for safety of personnel that systems baffled at 150 maximum gallon compartments are preferred. Exceptions of requirement shall be explained in detail accompanied with detailed engineering drawings.		

The water tank shall be located for the lowest possible center of gravity while providing 100% gravity flooded intakes to water pump.		
Fresh water shall enter the tanks through an in line 6" air gap, all aluminum covered anti-siphon device.		
Water level sight tubes of non-yellowing plastic shall be installed on both tanks.		
The sides of these water tanks shall not extend more than 48" out from the centerline of the truck chassis.		
A fresh water drain system shall be provided to completely drain the fresh water system from one location utilizing the 3" Y-strainer.		
A minimum 6" connection between tanks shall be provided.		
For stability safety, the water tanks shall not elevate with debris body during dump cycle.		
An air purge system utilizing the chassis air system shall be provided to assist displacing of residual water out of the high-pressure water system. System shall utilize the truck chassis air compressor to fill a 13-gallon auxiliary air storage chamber with pressure gauge and pressure protection valves to isolate the holding tank from the chassis compressor. System shall be equipped with ball valve and all necessary high pressure piping hoses, couplings and controls.		
A 3 in-line "Y" trap strainer shall be located at inlet of water tank fill air-gap.		
A 3 in-line "Y" trap stainless steel strainer shall be located between the water cells and water pump.		
A Gate Valve shall be provided at water pump.		
Water tank must be a certified metered capacity of 1300 gallons, at a minimum. Certification shall be necessary upon delivery.		
Water tanks shall be constructed of 1/8" aluminum with baffled compartments maximum 150 gallons each. Or other equivalent material.		
Liquid Float Level Indicator shall be provided.		
<b>WATER PUMP SYSTEM</b>		
For most efficient use of horsepower and reduced fuel consumption, high pressure rodder pump shall be hydraulically driven via (2) variable displacement pumps		
Hydraulic powered rodder pump via (2) variable displacement hydraulic pumps utilizing (2) 10-bolt PTO's.		
High pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI (submit manufacturer support documentation).		
High-pressure water (rodder) pump system shall be completely controlled through the range with use of the onboard computer controlled system. Control and throttle located on the control panel.		
Digital flow meter shall be displayed in front LCD display. Flow meter shall be capable of displaying system flow in all pump operating modes. In addition, a low water alarm shall be provided.		
Water pump speed to remain fully adjustable via an independent operator input regardless of the selected vacuum drive speed.		
Variable flow systems routing water back-to-tank are not considered equal due to additional wear, horsepower and fuel consumption. Any deviation from this drive requirement should have full explanation of horsepower consumption.		
Water (rodder) pump shall include smooth and pulsation operation mode feature without altering pump flow.		
When required to assist nozzle breaking through obstructions, water pump "pulsation mode" shall provide a forward-acting nozzle surge. Pulsation surge wave shall allow nozzle to punch forward 2" to 18" depending on flow dynamics and length of hose in sewer pipe.		
Explanation of forward-acting pulsation method shall be submitted with bid or explained below. Systems that require the use of air induction into the water pump shall not be accepted.		
Water pump location shall provide a flooded gravity suction inlet to eliminate potential cavitation damage.		
An oil to water heat exchanger will be provided in the water system to cool all hydraulic fluids on the unit. State horsepower requirement to operate hydraulics at full speed:		

The water pump shall provide precise 0-80 GPM controlled flow at variable pressure up to 2500 PSI.		
An extreme cold weather recirculation system - minimum 25 GPM via transmission PTO at chassis engine idle speed.		
A hydro-pneumatic nitrogen charged accumulator system shall be provided with all control valves, piping and hoses for either continuous flow or jackhammer rodding. Accumulator shall be a 2.5 gallon capacity and 1000 to 2500 PSI pressure rating.		
Two (2) 1/2" high pressure ball valves shall be provided for draining the water pump and flushing sediment from the bottom of the pump.		
A nozzle rack accommodating (3) nozzles shall be provided in curbside toolbox. The nozzles shall be labeled on storage rack for pipe size/flow and application.		
System shall be relieved to protect operator.		
Handgun shall be supplied that allows for changing of flow pattern from a fine mist to a steady stream.		
Handgun shall come equipped with quick connect couplers.		
An additional 1" water relief valve shall be provided.		
A mid-ship quick disconnect handgun couplers shall be provided.		
Front and rear quick disconnect handgun couplers shall be provided.		
Hydro-Excavation Package - Includes Lances, Nozzles, Storage Tray, and Vacuum Tubes.		
Water system shall allow precise variable flow control range of 0-22 GPM at 2500 PSI with digital flow meter in clear view of adjustment control.		
A water pump hour meter shall be provided.		
A high-pressure hose reel capable of operating at system pressure shall be provided.		
Minimum of a 1,300 gallon fresh water capacity.		
<b>VACUUM/VACUUM DRIVE SYSTEM</b>		
Vacuum shall be provided by a positive displacement rotary lobe type blower driven via chassis engine and heavy duty split transfer case direct to the blower.		
Interlock safety system shall prevent drive axle from engaging.		
A horizontal silencer with rain cap shall exhaust above the cab.		
A blower tachometer / hour meter shall be provided and displayed digitally on front control screen.		
For most efficient use of horsepower and fuel consumption, full vacuum and/or combination operation shall be approximately 1750 RPM of chassis drive engine.		
Blower shall be driven by the chassis engine and shall produce inlet volume of 4500 cfm @ 0" hg @ 2250 rpm, and 3490 cfm @ 18" hg @ 2250 rpm vacuum (Roots 824RCS 18 or equal). Drive engine not to exceed 1760 RPM.		
For added protection, the vacuum system shall have three (3) relief valves set at 18" hg, heavy duty horizontal mounted noise muffler, removable and cleanable filter screen, and shall be enclosed with a steel cage guard for safety.		
Transfer case shall be activated by air via a one touch control located in cab with animated confirmation on screen.		
A hot shift blower drive system shall be provided, including transfer case, air shift control, vacuum relief, and front control for blower engagement.		
Blower shall be driven from chassis engine via the transmission drive shafts and heavy duty split shaft transfer case direct to blower, engagement via one touch control on front control panel.		
The blower drive mechanism shall be engaged and disengaged via an electrical switch located at the operator's station on the front mounted hose reel. This feature shall reduce blower runtime and to extend the blower service life.		
Blower shall be provided with a horizontal silencer with exhaust above the cab and rain cap protecting the silencer from rain water.		
Blower shall draw air from two (2) separate ports in the debris body.		
Hydraulic shut off valves shall be provided at the suction, return and filter lines to permit servicing of the hydraulic system.		

<b>VACUUM BOOM SYSTEM</b>		
Vacuum hose shall be designed for front operation with hose mounted and stored at front mounted work station. Front mounted location is required for ease of positioning vacuum hose as well as minimizing need for operator to swing hose into traffic.		
All connections between debris body and vacuum system will be of the self-adjusting pressure fitting type.		
Vacuum hose will remain stationary and not rise with debris body.		
Upper debris tube shall consist of an anchored steel tube and elbow.		
A sub-frame mounted cab guard shall be mounted behind cab with boom rest cradle.		
All vacuum pipes shall be connected to vacuum pick up tube and extension pipes by adjustable over-center quick clamps to join the aluminum flanges on pipes.		
One (1) quick clamp for each pipe supplied shall be provided.		
Boom pedestal shall be directly mounted to module subframe.		
Boom support used for travel mode shall not interfere with access or require removal to tilt hood forward.		
A control station shall be equipped with a control joystick for all directions as well as a safety emergency shut-down button, which shall automatically eliminate power to boom.		
The vacuum boom shall have a heavy-duty flexible hose assembly joining the transition pipe to the debris body, and a 70-degree elbow and 5-1/2 heavy duty hose at the suction end of the boom.		
Boom shall rotate 180 degrees and shall be operated by an electric over hydraulic system. Lift and swing movements shall be actuated by hydraulic cylinders.		
The horizontal inner steel vacuum tube and inner box beam boom section shall telescope (tube within tube, box beam within box beam) and retract a minimum of 10' without affecting the vertical position of the pick-up tubes, and shall be located at the front work station in its retracted position, providing 324" maximum reach off the longitudinal axis of unit.		
A joystick for hydraulic control of the boom shall be installed on hose reel front panel.		
A removable 4" diameter storage "Post" to stabilize the lower boom hose during transport. Storage device shall not interfere with raising hood.		
A cordless remote boom control system equipped to activate boom functions, throttle, water pump on/off, hose reel in/out, hose reel speed, vacuum relief on/off and emergency disengagement e-stop shall be provided.		
A rotatable inlet hose for telescopic boom shall be provided.		
A detailed engineering drawing must be supplied showing the relationship of the hose reel in relation with the vacuum boom range of motion. Drawing shall show module mounted on chassis, full arc of vacuum hose both retracted and extended, full rotation of arc for hose reel in the extended position and dimension all arc lengths of vacuum boom retracted and extended. Drawing shall highlight intersection areas whereby combination cleaning is possible (within full arc on telescoping boom system).		
Unit must be capable of a lift of 35' of sewer flow (including liquids, rags, grease, and other solids)		
<b>HOSE REEL</b>		
Hose reel assembly shall be direct frame mounted.		
Hose reel assembly shall be mounted on an independent frame that can be removed from brackets attached permanently to front of main truck frame members.		
Reel will be manufactured out of 1/4" spun steel for added structural strength and shall require no internal or external reinforcements that could damage rodder hose.		
Hose reel shall be driven by adjustable gear reduction chain and sprocket assembly.		
Hose reel shall operate at full rotational speed while chassis engine is at idle.		
Hydraulic Telescoping Rotating Hose Reel - 800' capacity of 1" hose shall be provided.		
The front mounted hose reel shall telescope 15" forward down centerline of truck.		
Entire reel assembly shall rotate 270 degrees on a large diameter ball bearing.		
Hose reel shall include a dual locking device to positively lock reel in any position across		

operating range.		
The hose reel shall rotate about the reel assembly centerline so the reel shall never extend beyond the truck width. Reel coverage diagram shall be submitted with bid.		
Controls shall accessible on both sides of the hose reel via a mounting station for the wireless remote control, allowing operator to work at either side of unit for safety purposes.		
800' x 1" Piranha Sewer Hose / 2500 Psi shall be provided		
An automatic hose level wind scroll device shall be supplied. An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages.		
An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages. Pinch roller must be activated via a one touch, backlit button with lighted feedback on the control panel.		
Digital footage counter displaying footage values shall be provided. System must be capable of resetting value to ensure operator safety. Accuracy To Within One Percent Of Actual Distance, Large Easy To Read Lcd Screen located on the front control panel screen.		
10' Leader Hose		
<b>WASHDOWN EQUIPMENT</b>		
A handgun with 1/2" x 35' hose shall be provided at mid-ship to which allow the operator to deliver water to area served by pick up hose and to the inside of the debris body for clean out.		
Hand sprayer with adjustable spray-pattern to be provided with trigger-style gun.		
<b>FRONT OPERATING STATION AND CONTROLS</b>		
Primary operator station will be located at front of hose reel.		
All operator controls should be located on a single control panel that can be rotated on a 90 degree arc for an operator customizable location. The control panel shall also feature the ability to raise and lower to accommodate operators of different height.		
Station shall include a 7" Touch enabled display screen with corresponding tactile buttons for reading critical machine data including ( hose footage, hose reel speed settings, water pressure, water flow. Air mover information, chassis data, mode indicator, chassis fuel level, and diagnostic controls), Back lit button keypads with, laser etched function icons, and 4 light feedback indicators. These buttons shall operate the following functions: All setup functions (remote/panel selector, work lights, hose reel extend/retract, hose reel lock, and pinch roller activation) and Vacuum functions. Additionally, there will be separate sealed rocker switches for Water Pump on/off and Throttle up/down. There shall be a multi flow control dial for controlling the full range of the water pump.		
There shall be a hose reel joystick to control the pay in and pay out of the hose reel, this joystick shall offer speed control that increases the further the joystick is moved in either direction. There shall be an additional hose reel speed dial for setting specific speed ranges of the reel. There shall be a boom joystick that controls all function of the boom including up/down, left/right, and extend/retract. There shall be a E-Stop button to bring the machine to safe operating condition		
Tachometer and hour meter for chassis engine provided at control station shall be provided.		
Tachometer and hour meter for blower provided at control station shall be provided.		
All Hydraulic Functions - Color Coded, Sealed Electric/Hydraulic NEMA 4 switches shall be provided.		
Blower Engagement/Vacuum Relief - Sealed Electric/Air NEMA 4 Switch shall be provided.		
Water pump hour meter shall be provided.		
PTO hour meter shall be provided.		
A temperature light and alarm shall be provided. Light and alarm will be activated when hydraulic temperature reaches 180 F.		
Front control screen shall display a water level indicator to show level of water through the range of the tank.		
Front control screen shall display the debris body level.		
<b>IN CAB CONTROLS</b>		
All In cab controls are to be located on a single in cab control screen. This shall be a full color		

display screen. It shall utilize 12 back lit tactile (glove ready) buttons on the sides of the screen as well as feature touch screen operation.		
All Back up camera Features shall be displayed on the In Cab Control Screen.		
All work lights shall be able to be activated or deactivated in cab with on screen controls.		
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All standard arrow boards or arrow stick shall be controlled via an on screen controller		
All safety strobes and beacons shall be controlled via on screen controller		
Jet or Combo mode shall be activated via one touch button on the control panel. Control screen must display an on screen representation of the chassis drive system and must animate to show as drive systems activate or deactivate.		
Recirculation must be activated on the in cab control screen and visibly show that it is active at all times.		
<b>ELECTRICAL &amp; SAFETY LIGHTING</b>		
The entire system shall be vapor sealed to eliminate moisture damage, "Nema-4" type or equal.		
Logs, reports, and hour meters will be accessible via the display.		
All electrical connections shall be void of exposed wires or terminals nor should they be painted. Paint process shall be completed prior to installation of wiring.		
All wiring shall be color-coded and encased in conduit to scaled terminal boxes with circuit breakers.		
All other lights required by State and Federal Laws.		
One-piece directional 10-light arrow board (Signal Master or equal) shall be mounted on rear door of debris body, with controls mounted in cab.		
Handheld, Pistol Grip LED Spot light with rechargeable Lithium Ion battery.		
Operator station shall have back lit buttons for low light operation.		
Hose reel manhole work lights shall be provided		
(2) L.E.D. Boom work lights shall be provided.		
L.E.D. Work light at midship curbside shall be provided.		
L.E.D. Work light at midship street side shall be provided.		
(2) L.E.D. Rear door work lights shall be provided		
L.E.D. Lights, Clearance, Back-Up, Stop, Tail & Turn shall be provided.		
Mid-Ship L.E.D Bubble Type Turn Signals Shall be Provided		
<b>SAFETY EQUIPMENT</b>		
E-stop shall be located at each operator interface location. Standard locations to include: front hose reel, mid-ship curbside dump controls, & wireless controller (if equipped.)		
Electrical system controls shall be configured to allow for single point operation only. Upon engagement of controls at specified locations, additional controls shall be disabled.		
Electrical system must enable self-check to ensure all switches are in home position prior to critical function enablement. System must "lock out" controls when switch is not in home position.		
Rear work lights shall be activated upon engagement of reverse gear.		
(1) Emergency Flare Kit		
(1) 5# Fire Extinguisher.		
7" dash monitor, 2-camera system shall be provided. A Front Hose Reel Color Camera with 130 degree Viewing Angle shall be provided to provide a front visual of the manhole cover to aid in equipment set-up. A rear back-up color camera with 130 degree viewing angle shall be provided. Camera to have automatic activation when the unit is switched to reverse.		
The unit shall utilize a high temperature monitoring safety device to automatically disable the vacuum system when the outlet temperature of the positive displacement blower reaches a high temperature limit.		



Digital water pressure shall be displayed in front LCD display. Pressure gauge shall be capable of displaying water system pressure in all pump operating modes.		
<b>SEWER TOOLS AND ACCESSORIES</b>		
(1) 30 Sand Nozzle		
(1) 30 deg. Sanitary Nozzle		
(1) 15 deg. Penetrator Nozzle		
(1) 1" Small finned nozzle pipe skid		
<b>VACUUM TOOLS AND ACCESSORIES</b>		
The basic vacuum tube package shall include the following:		
(1) 8" x 3' aluminum pipe		
(2) 8" x 5' aluminum pipe		
(1) 8" x 6'6" catch basin tube		
(4) 8" quick clamps		
<b>CHASSIS EQUIPMENT AND STORAGE</b>		
Two (2) front tow hooks shall be provided.		
Two (2) rear tow hooks shall be provided.		
A safety cone storage rack shall be provided to contain safety cones in the inverted position.		
Aluminum Toolbox - Behind Cab		
(1) 18" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.		
(1) 48" x 22" x 24" Aluminum Toolbox Mounted curb side shall be provided.		
(2) 18 In. x 16 In. x 12 In. Aluminum Toolbox - Front Bumper shall be provided.		
(1) 60" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.		
(4) Long Handle Tool Storage Locations Behind Cab shall be provided		
<b>MODULE FINISH</b>		
Painting of the module shall be with a DuPont Imron Elite Polyurethane Enamel Top Coat. Application is to be a wet top coat applied to a dried and sanded primer base.		
<b>CHASSIS SPECIFICATION</b>		
The unit shall be a new model. No discontinued models will be accepted		
Freightliner 114SD Conventional Cab Chassis		
The unit shall be equipped with a diesel engine, turbo charged and after cooled, with a Detroit Diesel 13 12.8L; 435 HP @ 1800 RPM, 1650 LB/FT @ 1100 RPM		
Set Forward Axle		
The unit shall be equipped with an Allison 4000 RDS Automatic Transmission with PTO Provision		
The unit shall be equipped with a Meritor MFS-20-133A 20,000# Wide Track, I-Beam Type Single Front Axle		
The unit shall be equipped with a 20,000# Flat Leaf Front Suspension		
The unit shall be equipped with a Meritor RT-46-160P 46,000# R-Series Tandem Rear Axle		
The unit shall be equipped with a 46,000# Hendrickson RT463 Rear Suspension		
The unit shall be equipped with a 114 inch BBC flat room aluminum conventional cab		
The unit shall have a wheelbase of 277 inches		
The unit shall have a 7/16 x 3-9/16 x 11-1/8 inch steel frame with 120 KSI rating		
The unit shall have a 1/4 inch C-Channel inner frame reinforcement		
The unit shall have a 71 inch rear frame overhang		
The unit must be capable of fuel dosing of after treatment enabled in PTO mode-cleans hydrocarbons at high temperatures only.		
Unit must be equipped with air actuated rear axle lockers on one switch, and inter axle cross locking on other switch, to lock in both of the tandem axles (DCDL/IAD)		
The unit must be compliant with all DOT and FMCSA regulations.		
<b>ADDITIONAL PARTS</b>		
(1) 8" x 3' Aluminum Vacuum Tube		
(1) 8" x 5' Aluminum Vacuum Tube		

(1) 8" x 7'-6" Aluminum Vacuum Tube		
(1) 8" x 78" Higbee C/B Nozzle Assembly		
(6) 8" Quick Clamp Assembly		
(1) 8" Adjustable Air Adapter		
(1) Flexible Hose Guide		
<b>DEALER</b>		
Equipment dealer must be within 40 miles of Merrimack Water Treatment facility.		
Equipment dealer must have road trucks available for travel to customer's site		
Parts must be in stock at dealer's location, and on occasion from manufacturer within 48 hours		
Equipment dealer must have been representing offered product for over 20 years		
Dealer must have over 50 units of the model offered out in the field		
<b>Warranty</b>		
Extended warranty on emissions system pricing to be included in bid package (pricing for all warranty periods offered to be included with bid package.)		
Warranties to be included in bid package on all aspects of Unit. Listed out in individual line items for clarity.		
<b>Training</b>		
Training in the operations and maintenance of the unit to be included.		



## TOWN OF MERRIMACK, NEW HAMPSHIRE

### FINANCE DEPARTMENT

6 Baboosic Lake Road  
Merrimack, NH 03054

Tel: 603-424-7075

Fax: 603-424-0461

### Combination Sewer Cleaner Truck for Waste Water Treatment Facility Bid Form

Due by 2:00PM on Tuesday, November 24, 2020

Combination Sewer Cleaner Truck, according to the Town's  
Bid specifications

\$ 425,614<sup>00</sup>

Mfg & Model: HIVAC Aquatech B10

Allowance for Trade in

(\$ 25,000<sup>00</sup>)

Total price: \$ 400,614<sup>00</sup>

Warranty: 1 year 1000 hours parts and labor

Enclosed:

- Warranty information  
 Detailed specifications on equipment

The above bid is provided in accordance with the Town of Merrimack's bid invitation dated November 2, 2020 except as indicated below:

Bidder: Donovan Equipment  
Street Address: 6 Enterprise Dr  
City, State, Zip Code: Londonderry, NH 03053  
Phone No: 603 234 6313 Fax No: 603 669 0501  
Authorized Signature: [Signature]  
Printed Name: Nathan Villanueva  
Email: nate@donovancompany.com Date: 11/24/20



## TOWN OF MERRIMACK, NEW HAMPSHIRE

### FINANCE DEPARTMENT

6 Baboosic Lake Road  
Merrimack, NH 03054

Tel: 603-424-7075

Fax: 603-424-0516

### BID SPECIFICATIONS COMBINATION SEWER CLEANER TRUCK

INTENT	yes	no
The intent of this specification is to provide for the purchase of one (1) new and unused single-engine combination sewer and catch basin cleaner used for removing all debris commonly found in catch basins/storm lead structures and sanitary sewer lines/manhole structures using a front mounted operating station. The unit shall consist of a Positive Displacement (PD) Blower vacuum system, a hydraulically driven high pressure water pump, an enclosed sealed body for storage of collected debris and equipped with a self-contained water supply as the source for the water pump system. The unit shall have the capability of operating both vacuum and water system simultaneously at full operating speeds continuously. (Submit horsepower requirements of all systems on unit)	✓	
<b>EQUIVALENT PRODUCT</b>		
Bids will be accepted for consideration on any make or model that is equal or superior to the equipment specified. Decisions of equivalency will be at the sole interpretation of the Merrimack NH Sewer Purchasing and Public Services Director.	✓	
Bidder shall demonstrate a reasonable likeness of the equipment being offered within a reasonable time of request. Equipment demonstrated shall be equipped with all accessories and components required in this specification to ascertain equivalence.	✓	
A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence. Original manufacturer's brochures of the proposed unit are to be submitted with the proposal.	✓	
<b>BIDDER REFERENCES</b>		
To ensure adequate local availability of parts and competent service from experienced suppliers, bids are preferred from local vendors who have sold and serviced at least 30 units of same manufacturer within service area of Merrimack NH Sewer and should include contacts with phone numbers.	✓	
<b>SERVICE AND SUPPORT</b>		
Location of warranty service center and amount of inventory shall be noted which may be verified and inspected.		
Amount of OEM parts at this facility: this information to be included with bid package submittal.		
Years of servicing equipment being bid: this information to be included with bid package submittal.	✓	10 years
Number of factory qualified service technician: this information to be included with bid package submittal.	✓	
<b>GENERAL</b>		
The specification herein states the minimum requirements of the Merrimack, NH Sewer. All bids	✓	

must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. Any bid not prepared and submitted in accordance with the bid document and specification, or any bid lacking sufficient technical literature to enable the Merrimack NH Sewer to make a reasonable determination of compliance to the specification will be considered "non-responsive" and grounds for rejection.		
<b>SUBFRAME</b>		
The equipment shall be of modular design consisting of vacuum system, water tanks system, debris body and drive system.	✓	
A sub frame shall be fabricated to the exact dimensions of the truck chassis for mounting of modular components.	✓	
All components of the module shall attach to the sub frame and not directly to the chassis.	✓	
Sub frame shall be designed to ASME standards for maximum applied loads, chassis frame movement and even distribution of weight to the chassis and suspension.	✓	
Sub frame shall be continuous and uninterrupted from back of cab to end of frame.	✓	
<b>DEBRIS BODY</b>		
Efficiency of air movement through debris body will be measured for minimal restriction as measured by vacuum pressure gauge while operating blower at full speed. Pressure drop throughout entire system (from 8" hose inlet to blower inlet) including specified filtration and blower protection devices shall be no greater than 3" hg as measured at blower.	✓	
The body shall be cylindrical having a minimum usable liquid capacity of 12 cubic yards.		✓
The body shall be capable of high dump height of 60". Dump height of 60" must be achieved without the use of scissor lift mechanism.		✓
The debris storage body shall be constructed with a minimum 1/4" corrosion and abrasion resistant steel.	✓	
The debris storage body shall have a minimum yield point of 50,000 PSI and a minimum tensile strength of 70,000 PSI.	✓	
Body shall have a rear door that is hinged at the top and is equipped with a replaceable type seal. Adjustable for periodic compensation of door seal wear.	✓	
Dual outward mounted rear door props shall be included as standard to prevent operator from entering door swing path when engaging rear door prop.		✓
For optimal particulate separation, vacuum shall be drawn from separate ports in the top of the debris body.		✓
Body shall be dumped by raising the body to a 50 degree angle utilizing a forward mounted, double acting hydraulic dump cylinder.	✓	
Dump controls, accessory controls, e-stop control shall be provided at a central curb side location directly behind the cab of the truck.	✓	
For stability and safety, dumping must be accomplished while the pivot point of the body remains fixed to the subframe.	✓	
Industrial style rear debris body door shall be flat, and shall open and close hydraulically by cylinders mounted at the top of the body. Door shall open 50 degrees from the fully closed position. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body, so operator is not subject to sewage when dumping.		✓
Debris body shall have a body flush out system with a fan-type spray nozzle located in the front wall of the debris body to aid in the flushing of heavy debris. The nozzle shall also utilize (2) spray nozzles to flush the front most area of the debris body. System must produce a flow of 80GPM. Control valve shall be on the curb side of the unit.	✓	
Body shall have a float type automatic shut-off system protecting the Positive Displacement Blower with (2) 10" stainless steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out screen assembly and be accessed without the use of tools.		✓

The debris body shall be equipped with a rear door drain to drain off excess liquids while retaining solids and shall include a manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects.	✓	
The debris body shall be equipped with a rear door drain at bottom dead center to drain off excess liquids with an internal screen to prevent large solids from passing. A manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects shall be included at this location.	✓	
Vertical (cyclone) centrifugal separators shall be installed in-line between the debris body and the air mover, for each debris body discharge port. Each separator shall include large fallout chamber cleanout door.	✓	
For safety, a minimum of (5) vacuum tubes shall be stored on curbside storage racks to minimize operator exposure to traffic side of unit. Shall include quick release retainer handles (no bungees or clamps).		✓
A curb-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		✓
A street-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		✓
A rear door mounted folding 2-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).		✓
(2) Pipe Storage Racks on rear door with quick releases and (2) Pipe Storage Racks Curbside waist level.	✓	
A stainless steel micro-strainer (to 30 microns) shall be provided prior to the blower inlet, with (3) removable cartridge style screens and bottom drain port. Or equivalent filtration system.	✓	
A splash shield shall be mounted around the lower 60% of door opening to direct liquid and debris away from the chassis. Shield shall be minimum 10" deep bolted assembly with no openings.	✓	
A lubrication manifold system shall be provided to allow ground level greasing of boom lift and swing cylinders, float level indicator, top rear door hinges and debris body hoist cylinder pins.	✓	
A plastic lube chart shall be provided to call out when specific points on the unit should be greased.	✓	
A 6" valve, electrically activated, air operated valve debris body vacuum relief system shall be located in the inlet of the vacuum system to allow the venting of the tank and relieve vacuum at the debris intake hose. (3) Kunkel relief valves shall be included.	✓	
A debris inlet deflector distributing load evenly in debris body shall be included.	✓	
<b>WATER TANKS</b>	✓	
The water tanks shall be manufactured from a non-corrosive material to prevent rust yet still provide for maximum strength.	✓	
The water tank material shall require no internal coating and shall be repairable if patching is required.	✓	
The water tanks shall be easily removed from the subframe to provide complete access to the truck chassis for maintenance purposes.	✓	
The water tanks shall be adequately vented and connected to provide complete filling.	✓	
The water tanks shall be totally separate from the debris tanks and provide no structural support.	✓	
The water tanks shall share no common walls with the debris tanks to prevent corrosion.	✓	
The water tanks shall come equipped with an anti-siphon device and 25' of hydrant fill hose and fittings.	✓	
The water tanks shall carry a 10 year warranty against corrosion or cracking at a minimum.	Liberty	me
All water tanks shall be fully baffled to form a maximum compartment storage of 150 gallons for each compartment. Merrimack NH Sewer has determined that for the stability of the vehicle when turning and stopping and for safety of personnel that systems baffled at 150 maximum gallon compartments are preferred. Exceptions of requirement shall be explained in detail accompanied with detailed engineering drawings.		✓

The water tank shall be located for the lowest possible center of gravity while providing 100% gravity flooded intakes to water pump.	✓	
Fresh water shall enter the tanks through an in line 6" air gap, all aluminum covered anti-siphon device.	✓	
Water level sight tubes of non-yellowing plastic shall be installed on both tanks.	✓	
The sides of these water tanks shall not extend more than 48" out from the centerline of the truck chassis.	✓	
A fresh water drain system shall be provided to completely drain the fresh water system from one location utilizing the 3" Y-strainer.	✓	✓
A minimum 6" connection between tanks shall be provided.		✓
For stability safety, the water tanks shall not elevate with debris body during dump cycle.		✓
An air purge system utilizing the chassis air system shall be provided to assist displacing of residual water out of the high-pressure water system. System shall utilize the truck chassis air compressor to fill a 13-gallon auxiliary air storage chamber with pressure gauge and pressure protection valves to isolate the holding tank from the chassis compressor. System shall be equipped with ball valve and all necessary high pressure piping hoses, couplings and controls.	✓	
A 3 in-line "Y" trap strainer shall be located at inlet of water tank fill air-gap.	✓	
A 3 in-line "Y" trap stainless steel strainer shall be located between the water cells and water pump.	✓	
A Gate Valve shall be provided at water pump.	✓	
Water tank must be a certified metered capacity of 1300 gallons, at a minimum. Certification shall be necessary upon delivery.	✓	
Water tanks shall be constructed of 1/8" aluminum with baffled compartments maximum 150 gallons each. Or other equivalent material.		✓
Liquid Float Level Indicator shall be provided.	✓	
<b>WATER PUMP SYSTEM</b>		
For most efficient use of horsepower and reduced fuel consumption, high pressure rodder pump shall be hydraulically driven via (2) variable displacement pumps		✓
Hydraulic powered rodder pump via (2) variable displacement hydraulic pumps utilizing (2) 10-bolt PTO's.		✓
High pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI (submit manufacturer support documentation).		✓
High-pressure water (rodder) pump system shall be completely controlled through the range with use of the onboard computer controlled system. Control and throttle located on the control panel.		✓
Digital flow meter shall be displayed in front LCD display. Flow meter shall be capable of displaying system flow in all pump operating modes. In addition, a low water alarm shall be provided.		✓
Water pump speed to remain fully adjustable via an independent operator input regardless of the selected vacuum drive speed.		✓
Variable flow systems routing water back-to-tank are not considered equal due to additional wear, horsepower and fuel consumption. Any deviation from this drive requirement should have full explanation of horsepower consumption.		✓
Water (rodder) pump shall include smooth and pulsation operation mode feature without altering pump flow.	✓	
When required to assist nozzle breaking through obstructions, water pump "pulsation mode" shall provide a forward-acting nozzle surge. Pulsation surge wave shall allow nozzle to punch forward 2" to 18" depending on flow dynamics and length of hose in sewer pipe.	✓	
Explanation of forward-acting pulsation method shall be submitted with bid or explained below. Systems that require the use of air induction into the water pump shall not be accepted.	✓	
Water pump location shall provide a flooded gravity suction inlet to eliminate potential cavitation damage.	✓	
An oil to water heat exchanger will be provided in the water system to cool all hydraulic fluids on the unit. State horsepower requirement to operate hydraulics at full speed:		✓

The water pump shall provide precise 0-80 GPM controlled flow at variable pressure up to 2500 PSI.	✓	
An extreme cold weather recirculation system - minimum 25 GPM via transmission PTO at chassis engine idle speed.		✓
A hydro-pneumatic nitrogen charged accumulator system shall be provided with all control valves, piping and hoses for either continuous flow or jackhammer rodding. Accumulator shall be a 2.5 gallon capacity and 1000 to 2500 PSI pressure rating. <i>Not required on our system</i>		✓
Two (2) 1/2" high pressure ball valves shall be provided for draining the water pump and flushing sediment from the bottom of the pump.	✓	
A nozzle rack accommodating (3) nozzles shall be provided in curbside toolbox. The nozzles shall be labeled on storage rack for pipe size/flow and application.	✓	
System shall be relieved to protect operator.	✓	
Handgun shall be supplied that allows for changing of flow pattern from a fine mist to a steady stream.	✓	
Handgun shall come equipped with quick connect couplers.	✓	
An additional 1" water relief valve shall be provided.	✓	
A mid-ship quick disconnect handgun couplers shall be provided.	✓	
Front and rear quick disconnect handgun couplers shall be provided.		✓
Hydro-Excavation Package - Includes Lances, Nozzles, Storage Tray, and Vacuum Tubes. Water system shall allow precise variable flow control range of 0-22 GPM at 2500 PSI with digital flow meter in clear view of adjustment control.	✓	
A water pump hour meter shall be provided.	✓	
A high-pressure hose reel capable of operating at system pressure shall be provided.	✓	
Minimum of a 1,300 gallon fresh water capacity.	✓	
<b>VACUUM/VACUUM DRIVE SYSTEM</b>		
Vacuum shall be provided by a positive displacement rotary lobe type blower driven via chassis engine and heavy duty split transfer case direct to the blower.	✓	
Interlock safety system shall prevent drive axle from engaging.	✓	
A horizontal silencer with rain cap shall exhaust above the cab.		✓
A blower tachometer / hour meter shall be provided and displayed digitally on front control screen.		✓
For most efficient use of horsepower and fuel consumption, full vacuum and/or combination operation shall be approximately 1750 RPM of chassis drive engine.		✓
Blower shall be driven by the chassis engine and shall produce inlet volume of 4500 cfm @ 0" hg @ 2250 rpm, and 3490 cfm @ 18" hg @ 2250 rpm vacuum (Roots 824RCS 18 or equal). Drive engine not to exceed 1760 RPM.	✓	
For added protection, the vacuum system shall have three (3) relief valves set at 18" hg, heavy duty horizontal mounted noise muffler, removable and cleanable filter screen, and shall be enclosed with a steel cage guard for safety.	✓	
Transfer case shall be activated by air via a one touch control located in cab with animated confirmation on screen.	✓	
A hot shift blower drive system shall be provided, including transfer case, air shift control, vacuum relief, and front control for blower engagement.	✓	
Blower shall be driven from chassis engine via the transmission drive shafts and heavy duty split shaft transfer case direct to blower, engagement via one touch control on front control panel.	✓	
The blower drive mechanism shall be engaged and disengaged via an electrical switch located at the operator's station on the front mounted hose reel. This feature shall reduce blower runtime and to extend the blower service life.	✓	
Blower shall be provided with a horizontal silencer with exhaust above the cab and rain cap protecting the silencer from rain water.		✓
Blower shall draw air from two (2) separate ports in the debris body.		✓
Hydraulic shut off valves shall be provided at the suction, return and filter lines to permit servicing of the hydraulic system.	✓	



<b>VACUUM BOOM SYSTEM</b>		
Vacuum hose shall be designed for front operation with hose mounted and stored at front mounted work station. Front mounted location is required for ease of positioning vacuum hose as well as minimizing need for operator to swing hose into traffic.	✓	✓
All connections between debris body and vacuum system will be of the self-adjusting pressure fitting type.	✓	✓
Vacuum hose will remain stationary and not rise with debris body.		✓
Upper debris tube shall consist of an anchored steel tube and elbow.		✓
A sub-frame mounted cab guard shall be mounted behind cab with boom rest cradle.		✓
All vacuum pipes shall be connected to vacuum pick up tube and extension pipes by adjustable over-center quick clamps to join the aluminum flanges on pipes.	✓	
One (1) quick clamp for each pipe supplied shall be provided.	✓	✓
Boom pedestal shall be directly mounted to module subframe.		✓
Boom support used for travel mode shall not interfere with access or require removal to tilt hood forward.	✓	
A control station shall be equipped with a control joystick for all directions as well as a safety emergency shut-down button, which shall automatically eliminate power to boom.	✓	
The vacuum boom shall have a heavy-duty flexible hose assembly joining the transition pipe to the debris body, and a 70-degree elbow and 5-1/2 heavy duty hose at the suction end of the boom.	✓	✓
Boom shall rotate 180 degrees and shall be operated by an electric over hydraulic system. Lift and swing movements shall be actuated by hydraulic cylinders.	✓	
The horizontal inner steel vacuum tube and inner box beam boom section shall telescope (tube within tube, box beam within box beam) and retract a minimum of 10' without affecting the vertical position of the pick-up tubes, and shall be located at the front work station in its retracted position, providing 324" maximum reach off the longitudinal axis of unit.		✓
A joystick for hydraulic control of the boom shall be installed on hose reel front panel.		✓
A removable 4" diameter storage "Post" to stabilize the lower boom hose during transport. Storage device shall not interfere with raising hood.		N/A
A cordless remote boom control system equipped to activate boom functions, throttle, water pump on/off, hose reel in/out, hose reel speed, vacuum relief on/off and emergency disengagement e-stop shall be provided.	✓	
A rotatable inlet hose for telescopic boom shall be provided.	✓	
A detailed engineering drawing must be supplied showing the relationship of the hose reel in relation with the vacuum boom range of motion. Drawing shall show module mounted on chassis, full arc of vacuum hose both retracted and extended, full rotation of arc for hose reel in the extended position and dimension all arc lengths of vacuum boom retracted and extended. Drawing shall highlight intersection areas whereby combination cleaning is possible (within full arc on telescoping boom system).	✓	
Unit must be capable of a lift of 35' of sewer flow (including liquids, rags, grease, and other solids)	✓	✓
<b>HOSE REEL</b>		
Hose reel assembly shall be direct frame mounted.		✓
Hose reel assembly shall be mounted on an independent frame that can be removed from brackets attached permanently to front of main truck frame members.		✓
Reel will be manufactured out of 1/4" spun steel for added structural strength and shall require no internal or external reinforcements that could damage rodder hose.	✓	
Hose reel shall be driven by adjustable gear reduction chain and sprocket assembly.	✓	
Hose reel shall operate at full rotational speed while chassis engine is at idle.	✓	
Hydraulic Telescoping Rotating Hose Reel - 800' capacity of 1" hose shall be provided.	✓	
The front mounted hose reel shall telescope 15" forward down centerline of truck.		✓
Entire reel assembly shall rotate 270 degrees on a large diameter ball bearing.	✓	✓
Hose reel shall include a dual locking device to positively lock reel in any position across	✓	

operating range.	✓	
The hose reel shall rotate about the reel assembly centerline so the reel shall never extend beyond the truck width. Reel coverage diagram shall be submitted with bid.		✓
Controls shall accessible on both sides of the hose reel via a mounting station for the wireless remote control, allowing operator to work at either side of unit for safety purposes.	✓	✓
800' x 1" Piranha Sewer Hose / 2500 Psi shall be provided	✓	
An automatic hose level wind scroll device shall be supplied. An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages.	✓	
An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages. Pinch roller must be activated via a one touch, backlit button with lighted feedback on the control panel. N/A		
Digital footage counter displaying footage values shall be provided. System must be capable of resetting value to ensure operator safety. Accuracy To Within One Percent Of Actual Distance, Large Easy To Read Lcd Screen located on the front control panel screen.	✓	✓
10' Leader Hose	✓	
<b>WASHDOWN EQUIPMENT</b>		
A handgun with 1/2" x 35' hose shall be provided at mid-ship to which allow the operator to deliver water to area served by pick up hose and to the inside of the debris body for clean out.	✓	
Hand sprayer with adjustable spray-pattern to be provided with trigger-style gun.	✓	
<b>FRONT OPERATING STATION AND CONTROLS</b>		
Primary operator station will be located at front of hose reel.		✓
All operator controls should be located on a single control panel that can be rotated on a 90 degree arc for an operator customizable location. The control panel shall also feature the ability to raise and lower to accommodate operators of different height.	✓	
Station shall include a 7" Touch enabled display screen with corresponding tactile buttons for reading critical machine data including ( hose footage, hose reel speed settings, water pressure, water flow. Air mover information, chassis data, mode indicator, chassis fuel level, and diagnostic controls), Back lit button keypads with, laser etched function icons, and 4 light feedback indicators. These buttons shall operate the following functions: All setup functions (remote/panel selector, work lights, hose reel extend/retract, hose reel lock, and pinch roller activation) and Vacuum functions. Additionally, there will be separate sealed rocker switches for Water Pump on/off and Throttle up/down. There shall be a multi flow control dial for controlling the full range of the water pump.		✓
There shall be a hose reel joystick to control the pay in and pay out of the hose reel, this joystick shall offer speed control that increases the further the joystick is moved in either direction. There shall be an additional hose reel speed dial for setting specific speed ranges of the reel. There shall be a boom joystick that controls all function of the boom including up/down, left/right, and extend/retract. There shall be a E-Stop button to bring the machine to safe operating condition	✓	
Tachometer and hour meter for chassis engine provided at control station shall be provided.	✓	
Tachometer and hour meter for blower provided at control station shall be provided.		✓
All Hydraulic Functions - Color Coded, Sealed Electric/Hydraulic NEMA 4 switches shall be provided.	✓	
Blower Engagement/Vacuum Relief - Sealed Electric/Air NEMA 4 Switch shall be provided.	✓	
Water pump hour meter shall be provided.	✓	
PTO hour meter shall be provided.	✓	
A temperature light and alarm shall be provided. Light and alarm will be activated when hydraulic temperature reaches 180 F.		✓
Front control screen shall display a water level indicator to show level of water through the range of the tank.		✓
Front control screen shall display the debris body level.		✓
<b>IN CAB CONTROLS</b>		
All In cab controls are to be located on a single in cab control screen. This shall be a full color		✓

display screen. It shall utilize 12 back lit tactile (glove ready) buttons on the sides of the screen as well as feature touch screen operation.	✓	✓
All Back up camera Features shall be displayed on the In Cab Control Screen.	✓	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	}	
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All standard arrow boards or arrow stick shall be controlled via an on screen controller		
All safety strobes and beacons shall be controlled via on screen controller		
Jet or Combo mode shall be activated via one touch button on the control panel. Control screen must display an on screen representation of the chassis drive system and must animate to show as drive systems activate or deactivate.		✓
Recirculation must be activated on the in cab control screen and visibly show that it is active at all times.		✓
<b>ELECTRICAL &amp; SAFETY LIGHTING</b>		
The entire system shall be vapor sealed to eliminate moisture damage, "Nema-4" type or equal.	✓	
Logs, reports, and hour meters will be accessible via the display.		✓
All electrical connections shall be void of exposed wires or terminals nor should they be painted. Paint process shall be completed prior to installation of wiring.	✓	
All wiring shall be color-coded and encased in conduit to scaled terminal boxes with circuit breakers.	✓	
All other lights required by State and Federal Laws.	✓	
One-piece directional 10-light arrow board (Signal Master or equal) shall be mounted on rear door of debris body, with controls mounted in cab.	✓	
Handheld, Pistol Grip LED Spot light with rechargeable Lithium Ion battery.	✓	
Operator station shall have back lit buttons for low light operation.	✓	
Hose reel manhole work lights shall be provided	✓	
(2) L.E.D. Boom work lights shall be provided.	✓	
L.E.D. Work light at midship curbside shall be provided.	✓	
L.E.D. Work light at midship street side shall be provided.		✓
(2) L.E.D. Rear door work lights shall be provided	✓	
L.E.D. Lights, Clearance, Back-Up, Stop, Tail & Turn shall be provided.	✓	✓
Mid-Ship L.E.D Bubble Type Turn Signals Shall be Provided		✓
<b>SAFETY EQUIPMENT</b>	✓	
E-stop shall be located at each operator interface location. Standard locations to include: front hose reel, mid-ship curbside dump controls, & wireless controller (if equipped.)	✓	
Electrical system controls shall be configured to allow for single point operation only. Upon engagement of controls at specified locations, additional controls shall be disabled.		✓
Electrical system must enable self-check to ensure all switches are in home position prior to critical function enablement. System must "lock out" controls when switch is not in home position.		✓
Rear work lights shall be activated upon engagement of reverse gear.	✓	✓
(1) Emergency Flare Kit	✓	
(1) 5# Fire Extinguisher.	✓	
7" dash monitor, 2-camera system shall be provided. A Front Hose Reel Color Camera with 130 degree Viewing Angle shall be provided to provide a front visual of the manhole cover to aid in equipment set-up. A rear back-up color camera with 130 degree viewing angle shall be provided. Camera to have automatic activation when the unit is switched to reverse.	✓	
The unit shall utilize a high temperature monitoring safety device to automatically disable the vacuum system when the outlet temperature of the positive displacement blower reaches a high temperature limit.		✓

Digital water pressure shall be displayed in front LCD display. Pressure gauge shall be capable of displaying water system pressure in all pump operating modes.		✓
<b>SEWER TOOLS AND ACCESSORIES</b>	✓	
(1) 30 Sand Nozzle	✓	
(1) 30 deg. Sanitary Nozzle	✓	
(1) 15 deg. Penetrator Nozzle	✓	
(1) 1" Small finned nozzle pipe skid		
<b>VACUUM TOOLS AND ACCESSORIES</b>		
The basic vacuum tube package shall include the following:	✓	
(1) 8" x 3' aluminum pipe	✓	
(2) 8" x 5' aluminum pipe	✓	
(1) 8" x 6'6" catch basin tube	✓	
(4) 8" quick clamps	✓	
<b>CHASSIS EQUIPMENT AND STORAGE</b>		
Two (2) front tow hooks shall be provided.	✓	
Two (2) rear tow hooks shall be provided.	✓	
A safety cone storage rack shall be provided to contain safety cones in the inverted position.	✓	
Aluminum Toolbox - Behind Cab	✓	
(1) 18" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.	✓	✓
(1) 48" x 22" x 24" Aluminum Toolbox Mounted curb side shall be provided.	✓	
(2) 18 In. x 16 In. x 12 In. Aluminum Toolbox - Front Bumper shall be provided.		✓
(1) 60" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.	✓	✓
(4) Long Handle Tool Storage Locations Behind Cab shall be provided	✓	
<b>MODULE FINISH</b>		
Painting of the module shall be with a DuPont Imron Elite Polyurethane Enamel Top Coat.	✓	
Application is to be a wet top coat applied to a dried and sanded primer base.		
<b>CHASSIS SPECIFICATION</b>		
The unit shall be a new model. No discontinued models will be accepted	✓	
Freightliner 114SD Conventional Cab Chassis	✓	
The unit shall be equipped with a diesel engine, turbo charged and after cooled, with a Detroit Diesel 13 12.8L; 435 HP @ 1800 RPM, 1650 LB/FT @ 1100 RPM	✓	
Set Forward Axle	✓	
The unit shall be equipped with an Allison 4000 RDS Automatic Transmission with PTO Provision	✓	
The unit shall be equipped with a Meritor MFS-20-133A 20,000# Wide Track, I-Beam Type Single Front Axle	✓	✓
The unit shall be equipped with a 20,000# Flat Leaf Front Suspension	✓	✓
The unit shall be equipped with a Meritor RT-46-160P 46,000# R-Series Tandem Rear Axle	✓	✓
The unit shall be equipped with a 46,000# Hendrickson RT463 Rear Suspension	✓	✓
The unit shall be equipped with a 114 inch BBC flat room aluminum conventional cab	✓	✓
The unit shall have a wheelbase of 277 inches	✓	✓
The unit shall have a 7/16 x 3-9/16 x 11-1/8 inch steel frame with 120 KSI rating	✓	
The unit shall have a 1/4 inch C-Channel inner frame reinforcement	✓	
The unit shall have a 71 inch rear frame overhang	✓	
The unit must be capable of fuel dosing of after treatment enabled in PTO mode-cleans hydrocarbons at high temperatures only.	✓	
Unit must be equipped with air actuated rear axle lockers on one switch, and inter axle cross locking on other switch, to lock in both of the tandem axles (DCDL/IAD)	✓	
The unit must be compliant with all DOT and FMCSA regulations.	✓	
<b>ADDITIONAL PARTS</b>		
(1) 8" x 3' Aluminum Vacuum Tube	✓	
(1) 8" x 5' Aluminum Vacuum Tube	✓	

(1) 8" x 7'-6" Aluminum Vacuum Tube	✓	
(1) 8" x 78" Higbee C/B Nozzle Assembly	✓	
(6) 8" Quick Clamp Assembly	✓	
(1) 8" Adjustable Air Adapter	✓	
(1) Flexible Hose Guide		
<b>DEALER</b>	✓	
Equipment dealer must be within 40 miles of Merrimack Water Treatment facility.		
Equipment dealer must have road trucks available for travel to customer's site		✓
Parts must be in stock at dealer's location, and on occasion from manufacturer within 48 hours	✓	✓
Equipment dealer must have been representing offered product for over 20 years		✓
Dealer must have over 50 units of the model offered out in the field		✓
<b>Warranty</b>		
Extended warranty on emissions system pricing to be included in bid package (pricing for all warranty periods offered to be included with bid package.)		
Warranties to be included in bid package on all aspects of Unit. Listed out in individual line items for clarity.		
Training	✓	
Training in the operations and maintenance of the unit to be included.	✓	



**TOWN OF MERRIMACK, NEW HAMPSHIRE**

**FINANCE DEPARTMENT**  
**6 Baboosic Lake Road**  
**Merrimack, NH 03054**

**Tel: 603-424-7075**  
**Fax: 603-424-0461**

**Combination Sewer Cleaner Truck for Waste Water Treatment Facility  
Bid Form**

**Due by 2:00PM on Tuesday, November 24, 2020**

Combination Sewer Cleaner Truck, according to the Town's  
Bid specifications \$ 442,713.00

Mfg & Model: Vector 2112i PD Combo Sewer Cleaner mounted on 2022 Freightliner 114SD Chassis

Allowance for Trade in (\$ 25,000.00 )

Total price: \$ 417,713.00

Warranty: Standard - 1 Year / Water Pump - 2 Years / Debris Body - 5 Years / Water Tanks - 10 Tears

*Enclosed:*

- Warranty information*
- Detailed specifications on equipment*

The above bid is provided in accordance with the Town of Merrimack's bid invitation dated November 2, 2020 except as indicated below:

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Bidder: C.N. Wood Enviro, LLC  
Street Address: 200 Merrimac Street  
City, State, Zip Code: Woburn, MA 01801  
Phone No: 781-935-1919 Fax No: 781-937-9809  
Authorized Signature: *Paula F. Benard*  
Printed Name: Paula F. Benard  
Email: tfiore@cn-wood.com Date: 11/20/20



## TOWN OF MERRIMACK, NEW HAMPSHIRE

FINANCE DEPARTMENT  
 6 Baboosic Lake Road  
 Merrimack, NH 03054

Tel: 603-424-7075  
 Fax: 603-424-0516

### BID SPECIFICATIONS COMBINATION SEWER CLEANER TRUCK

<b>INTENT</b>		
The intent of this specification is to provide for the purchase of one (1) new and unused single-engine combination sewer and catch basin cleaner used for removing all debris commonly found in catch basins/storm lead structures and sanitary sewer lines/manhole structures using a front mounted operating station. The unit shall consist of a Positive Displacement (PD) Blower vacuum system, a hydraulically driven high pressure water pump, an enclosed sealed body for storage of collected debris and equipped with a self-contained water supply as the source for the water pump system. The unit shall have the capability of operating both vacuum and water system simultaneously at full operating speeds continuously. (Submit horsepower requirements of all systems on unit)		
<b>EQUIVALENT PRODUCT</b>		
Bids will be accepted for consideration on any make or model that is equal or superior to the equipment specified. Decisions of equivalency will be at the sole interpretation of the Merrimack NH Sewer Purchasing and Public Services Director.		
Bidder shall demonstrate a reasonable likeness of the equipment being offered within a reasonable time of request. Equipment demonstrated shall be equipped with all accessories and components required in this specification to ascertain equivalence.		
A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence. Original manufacturer's brochures of the proposed unit are to be submitted with the proposal.		
<b>BIDDER REFERENCES</b>		
To ensure adequate local availability of parts and competent service from experienced suppliers, bids are preferred from local vendors who have sold and serviced at least 30 units of same manufacturer within service area of Merrimack NH Sewer and should include contacts with phone numbers.	Yes	
<b>SERVICE AND SUPPORT</b>		
Location of warranty service center and amount of inventory shall be noted which may be verified and inspected.		
Amount of OEM parts at this facility: this information to be included with bid package submittal.	Approx.	\$1,500,000.00
Years of servicing equipment being bid: this information to be included with bid package submittal.	24 Years	
Number of factory qualified service technician: this information to be included with bid package submittal.	6 Qualified Technicians	
<b>GENERAL</b>		
The specification herein states the minimum requirements of the Merrimack, NH Sewer. All bids		

must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. Any bid not prepared and submitted in accordance with the bid document and specification, or any bid lacking sufficient technical literature to enable the Merrimack NH Sewer to make a reasonable determination of compliance to the specification will be considered "non-responsive" and grounds for rejection.		
<b>SUBFRAME</b>		
The equipment shall be of modular design consisting of vacuum system, water tanks system, debris body and drive system.	Yes	
A sub frame shall be fabricated to the exact dimensions of the truck chassis for mounting of modular components.	Yes	
All components of the module shall attach to the sub frame and not directly to the chassis.	Yes	
Sub frame shall be designed to ASME standards for maximum applied loads, chassis frame movement and even distribution of weight to the chassis and suspension.	Yes	
Sub frame shall be continuous and uninterrupted from back of cab to end of frame.	Yes	
<b>DEBRIS BODY</b>		
Efficiency of air movement through debris body will be measured for minimal restriction as measured by vacuum pressure gauge while operating blower at full speed. Pressure drop throughout entire system (from 8" hose inlet to blower inlet) including specified filtration and blower protection devices shall be no greater than 3" hg as measured at blower.	Yes	
The body shall be cylindrical having a minimum usable liquid capacity of 12 cubic yards.	Yes	
The body shall be capable of high dump height of 60". Dump height of 60" must be achieved without the use of scissor lift mechanism.	Yes	
The debris storage body shall be constructed with a minimum 1/4" corrosion and abrasion resistant steel.	Yes	
The debris storage body shall have a minimum yield point of 50,000 PSI and a minimum tensile strength of 70,000 PSI.	Yes	
Body shall have a rear door that is hinged at the top and is equipped with a replaceable type seal. Adjustable for periodic compensation of door seal wear.	Yes	
Dual outward mounted rear door props shall be included as standard to prevent operator from entering door swing path when engaging rear door prop.	Yes	
For optimal particulate separation, vacuum shall be drawn from separate ports in the top of the debris body.	Yes	
Body shall be dumped by raising the body to a 50 degree angle utilizing a forward mounted, double acting hydraulic dump cylinder.	Yes	
Dump controls, accessory controls, e-stop control shall be provided at a central curb side location directly behind the cab of the truck.	Yes	
For stability and safety, dumping must be accomplished while the pivot point of the body remains fixed to the subframe.	Yes	
Industrial style rear debris body door shall be flat, and shall open and close hydraulically by cylinders mounted at the top of the body. Door shall open 50 degrees from the fully closed position. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body, so operator is not subject to sewage when dumping.	Yes	
Debris body shall have a body flush out system with a fan-type spray nozzle located in the front wall of the debris body to aid in the flushing of heavy debris. The nozzle shall also utilize (2) spray nozzles to flush the front most area of the debris body. System must produce a flow of 80GPM. Control valve shall be on the curb side of the unit.	Yes	
Body shall have a float type automatic shut-off system protecting the Positive Displacement Blower with (2) 10" stainless steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out screen assembly and be accessed without the use of tools.	Yes	



The debris body shall be equipped with a rear door drain to drain off excess liquids while retaining solids and shall include a manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects.	Yes	
The debris body shall be equipped with a rear door drain at bottom dead center to drain off excess liquids with an internal screen to prevent large solids from passing. A manually operated 6" knife valve with cam-lock coupler and 25' of lay flat hose having camlock quick connects shall be included at this location.	Yes	
Vertical (cyclone) centrifugal separators shall be installed in-line between the debris body and the air mover, for each debris body discharge port. Each separator shall include large fallout chamber cleanout door.	Yes	
For safety, a minimum of (5) vacuum tubes shall be stored on curbside storage racks to minimize operator exposure to traffic side of unit. Shall include quick release retainer handles (no bungees or clamps).	Yes	
A curb-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).	Yes	
A street-side, folding 3-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).	Yes	
A rear door mounted folding 2-pipe rack shall be provided, constructed of steel tubing, spring assisted. Shall include quick release retainer handles (no bungees or clamps).	Yes	
(2) Pipe Storage Racks on rear door with quick releases and (2) Pipe Storage Racks Curbside waist level.	Yes	
A stainless steel micro-strainer (to 30 microns) shall be provided prior to the blower inlet, with (3) removable cartridge style screens and bottom drain port. Or equivalent filtration system.	Yes	
A splash shield shall be mounted around the lower 60% of door opening to direct liquid and debris away from the chassis. Shield shall be minimum 10" deep bolted assembly with no openings.	Yes	
A lubrication manifold system shall be provided to allow ground level greasing of boom lift and swing cylinders, float level indicator, top rear door hinges and debris body hoist cylinder pins.	Yes	
A plastic lube chart shall be provided to call out when specific points on the unit should be greased.	Yes	
A 6" valve, electrically activated, air operated valve debris body vacuum relief system shall be located in the inlet of the vacuum system to allow the venting of the tank and relieve vacuum at the debris intake hose.(3) Kunkel relief valves shall be included.	Yes	
A debris inlet deflector distributing load evenly in debris body shall be included.	Yes	
<b>WATER TANKS</b>		
The water tanks shall be manufactured from a non-corrosive material to prevent rust yet still provide for maximum strength.	Yes	
The water tank material shall require no internal coating and shall be repairable if patching is required.	Yes	
The water tanks shall be easily removed from the subframe to provide complete access to the truck chassis for maintenance purposes.	Yes	
The water tanks shall be adequately vented and connected to provide complete filling.	Yes	
The water tanks shall be totally separate from the debris tanks and provide no structural support.	Yes	
The water tanks shall share no common walls with the debris tanks to prevent corrosion.	Yes	
The water tanks shall come equipped with an anti-siphon device and 25' of hydrant fill hose and fittings.	Yes	
The water tanks shall carry a 10 year warranty against corrosion or cracking at a minimum.		
All water tanks shall be fully baffled to form a maximum compartment storage of 150 gallons for each compartment. Merrimack NH Sewer has determined that for the stability of the vehicle when turning and stopping and for safety of personnel that systems baffled at 150 maximum gallon compartments are preferred. Exceptions of requirement shall be explained in detail accompanied with detailed engineering drawings.	Yes	

The water tank shall be located for the lowest possible center of gravity while providing 100% gravity flooded intakes to water pump.	Yes	
Fresh water shall enter the tanks through an in line 6" air gap, all aluminum covered anti-siphon device.	Yes	
Water level sight tubes of non-yellowing plastic shall be installed on both tanks.	Yes	
The sides of these water tanks shall not extend more than 48" out from the centerline of the truck chassis.	Yes	
A fresh water drain system shall be provided to completely drain the fresh water system from one location utilizing the 3" Y-strainer.	Yes	
A minimum 6" connection between tanks shall be provided.	Yes	
For stability safety, the water tanks shall not elevate with debris body during dump cycle.		
An air purge system utilizing the chassis air system shall be provided to assist displacing of residual water out of the high-pressure water system. System shall utilize the truck chassis air compressor to fill a 13-gallon auxiliary air storage chamber with pressure gauge and pressure protection valves to isolate the holding tank from the chassis compressor. System shall be equipped with ball valve and all necessary high pressure piping hoses, couplings and controls.	Yes	
A 3 in-line "Y" trap strainer shall be located at inlet of water tank fill air-gap.	Yes	
A 3 in-line "Y" trap stainless steel strainer shall be located between the water cells and water pump.	Yes	
A Gate Valve shall be provided at water pump.	Yes	
Water tank must be a certified metered capacity of 1300 gallons, at a minimum. Certification shall be necessary upon delivery.	Yes	
Water tanks shall be constructed of 1/8" aluminum with baffled compartments maximum 150 gallons each. Or other equivalent material.	Yes	
Liquid Float Level Indicator shall be provided.	Yes	
<b>WATER PUMP SYSTEM</b>		
For most efficient use of horsepower and reduced fuel consumption, high pressure rodder pump shall be hydraulically driven via (2) variable displacement pumps	Yes	
Hydraulic powered rodder pump via (2) variable displacement hydraulic pumps utilizing (2) 10-bolt PTO's.	Yes	
High pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI (submit manufacturer support documentation).	Yes	
High-pressure water (rodder) pump system shall be completely controlled through the range with use of the onboard computer controlled system. Control and throttle located on the control panel.	Yes	
Digital flow meter shall be displayed in front LCD display. Flow meter shall be capable of displaying system flow in all pump operating modes. In addition, a low water alarm shall be provided.	Yes	
Water pump speed to remain fully adjustable via an independent operator input regardless of the selected vacuum drive speed.	Yes	
Variable flow systems routing water back-to-tank are not considered equal due to additional wear, horsepower and fuel consumption. Any deviation from this drive requirement should have full explanation of horsepower consumption.	Yes	
Water (rodder) pump shall include smooth and pulsation operation mode feature without altering pump flow.	Yes	
When required to assist nozzle breaking through obstructions, water pump "pulsation mode" shall provide a forward-acting nozzle surge. Pulsation surge wave shall allow nozzle to punch forward 2" to 18" depending on flow dynamics and length of hose in sewer pipe.	Yes	
Explanation of forward-acting pulsation method shall be submitted with bid or explained below. Systems that require the use of air induction into the water pump shall not be accepted.	Yes	
Water pump location shall provide a flooded gravity suction inlet to eliminate potential cavitation damage.	Yes	
An oil to water heat exchanger will be provided in the water system to cool all hydraulic fluids on the unit. State horsepower requirement to operate hydraulics at full speed:	Yes	

The water pump shall provide precise 0-80 GPM controlled flow at variable pressure up to 2500 PSI.	Yes	
An extreme cold weather recirculation system - minimum 25 GPM via transmission PTO at chassis engine idle speed.	Yes	
A hydro-pneumatic nitrogen charged accumulator system shall be provided with all control valves, piping and hoses for either continuous flow or jackhammer rodding. Accumulator shall be a 2.5 gallon capacity and 1000 to 2500 PSI pressure rating.	Yes	
Two (2) 1/2" high pressure ball valves shall be provided for draining the water pump and flushing sediment from the bottom of the pump.	Yes	
A nozzle rack accommodating (3) nozzles shall be provided in curbside toolbox. The nozzles shall be labeled on storage rack for pipe size/flow and application.	Yes	
System shall be relieved to protect operator.	Yes	
Handgun shall be supplied that allows for changing of flow pattern from a fine mist to a steady stream.	Yes	
Handgun shall come equipped with quick connect couplers.	Yes	
An additional 1" water relief valve shall be provided.	Yes	
A mid-ship quick disconnect handgun couplers shall be provided.	Yes	
Front and rear quick disconnect handgun couplers shall be provided.	Yes	
Hydro-Excavation Package - Includes Lances, Nozzles, Storage Tray, and Vacuum Tubes. Water system shall allow precise variable flow control range of 0-22 GPM at 2500 PSI with digital flow meter in clear view of adjustment control.	Yes	
A water pump hour meter shall be provided.	Yes	
A high-pressure hose reel capable of operating at system pressure shall be provided.	Yes	
Minimum of a 1,300 gallon fresh water capacity.	Yes	
<b>VACUUM/VACUUM DRIVE SYSTEM</b>		
Vacuum shall be provided by a positive displacement rotary lobe type blower driven via chassis engine and heavy duty split transfer case direct to the blower.	Yes	
Interlock safety system shall prevent drive axle from engaging.	Yes	
A horizontal silencer with rain cap shall exhaust above the cab.	Yes	
A blower tachometer / hour meter shall be provided and displayed digitally on front control screen.	Yes	
For most efficient use of horsepower and fuel consumption, full vacuum and/or combination operation shall be approximately 1750 RPM of chassis drive engine.	Yes	
Blower shall be driven by the chassis engine and shall produce inlet volume of 4500 cfm @ 0" hg @ 2250 rpm, and 3490 cfm @ 18" hg @ 2250 rpm vacuum (Roots 824RCS 18 or equal). Drive engine not to exceed 1760 RPM.	Yes	
For added protection, the vacuum system shall have three (3) relief valves set at 18" hg, heavy duty horizontal mounted noise muffler, removable and cleanable filter screen, and shall be enclosed with a steel cage guard for safety.	Yes	
Transfer case shall be activated by air via a one touch control located in cab with animated confirmation on screen.	Yes	
A hot shift blower drive system shall be provided, including transfer case, air shift control, vacuum relief, and front control for blower engagement.	Yes	
Blower shall be driven from chassis engine via the transmission drive shafts and heavy duty split shaft transfer case direct to blower, engagement via one touch control on front control panel.	Yes	
The blower drive mechanism shall be engaged and disengaged via an electrical switch located at the operator's station on the front mounted hose reel. This feature shall reduce blower runtime and to extend the blower service life.	Yes	
Blower shall be provided with a horizontal silencer with exhaust above the cab and rain cap protecting the silencer from rain water.	Yes	
Blower shall draw air from two (2) separate ports in the debris body.	Yes	
Hydraulic shut off valves shall be provided at the suction, return and filter lines to permit servicing of the hydraulic system.	Yes	

<b>VACUUM BOOM SYSTEM</b>		
Vacuum hose shall be designed for front operation with hose mounted and stored at front mounted work station. Front mounted location is required for ease of positioning vacuum hose as well as minimizing need for operator to swing hose into traffic.	Yes	
All connections between debris body and vacuum system will be of the self-adjusting pressure fitting type.	Yes	
Vacuum hose will remain stationary and not rise with debris body.	Yes	
Upper debris tube shall consist of an anchored steel tube and elbow.	Yes	
A sub-frame mounted cab guard shall be mounted behind cab with boom rest cradle.	Yes	
All vacuum pipes shall be connected to vacuum pick up tube and extension pipes by adjustable over-center quick clamps to join the aluminum flanges on pipes.	Yes	
One (1) quick clamp for each pipe supplied shall be provided.	Yes	
Boom pedestal shall be directly mounted to module subframe.	Yes	
Boom support used for travel mode shall not interfere with access or require removal to tilt hood forward.	Yes	
A control station shall be equipped with a control joystick for all directions as well as a safety emergency shut-down button, which shall automatically eliminate power to boom.	Yes	
The vacuum boom shall have a heavy-duty flexible hose assembly joining the transition pipe to the debris body, and a 70-degree elbow and 5-1/2 heavy duty hose at the suction end of the boom.	Yes	
Boom shall rotate 180 degrees and shall be operated by an electric over hydraulic system. Lift and swing movements shall be actuated by hydraulic cylinders.	Yes	
The horizontal inner steel vacuum tube and inner box beam boom section shall telescope (tube within tube, box beam within box beam) and retract a minimum of 10' without affecting the vertical position of the pick-up tubes, and shall be located at the front work station in its retracted position, providing 324" maximum reach off the longitudinal axis of unit.	Yes	
A joystick for hydraulic control of the boom shall be installed on hose reel front panel.	Yes	
A removable 4" diameter storage "Post" to stabilize the lower boom hose during transport. Storage device shall not interfere with raising hood.	Yes	
A cordless remote boom control system equipped to activate boom functions, throttle, water pump on/off, hose reel in/out, hose reel speed, vacuum relief on/off and emergency disengagement e-stop shall be provided.	Yes	
A rotatable inlet hose for telescopic boom shall be provided.		
A detailed engineering drawing must be supplied showing the relationship of the hose reel in relation with the vacuum boom range of motion. Drawing shall show module mounted on chassis, full arc of vacuum hose both retracted and extended, full rotation of arc for hose reel in the extended position and dimension all arc lengths of vacuum boom retracted and extended. Drawing shall highlight intersection areas whereby combination cleaning is possible (within full arc on telescoping boom system).	Yes	
Unit must be capable of a lift of 35' of sewer flow (including liquids, rags, grease, and other solids)	Yes	
<b>HOSE REEL</b>		
Hose reel assembly shall be direct frame mounted.	Yes	
Hose reel assembly shall be mounted on an independent frame that can be removed from brackets attached permanently to front of main truck frame members.	Yes	
Reel will be manufactured out of 1/4" spun steel for added structural strength and shall require no internal or external reinforcements that could damage rodder hose.	Yes	
Hose reel shall be driven by adjustable gear reduction chain and sprocket assembly.	Yes	
Hose reel shall operate at full rotational speed while chassis engine is at idle.	Yes	
Hydraulic Telescoping Rotating Hose Reel - 800' capacity of 1" hose shall be provided.	Yes	
The front mounted hose reel shall telescope 15" forward down centerline of truck.	Yes	
Entire reel assembly shall rotate 270 degrees on a large diameter ball bearing.	Yes	
Hose reel shall include a dual locking device to positively lock reel in any position across	Yes	

operating range.	Yes	
The hose reel shall rotate about the reel assembly centerline so the reel shall never extend beyond the truck width. Reel coverage diagram shall be submitted with bid.	Yes	
Controls shall accessible on both sides of the hose reel via a mounting station for the wireless remote control, allowing operator to work at either side of unit for safety purposes.	Yes	
800' x 1" Piranha Sewer Hose / 2500 Psi shall be provided	Yes	
An automatic hose level wind scroll device shall be supplied. An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages.	Yes	
An air-cylinder actuated pinch-roller shall exert downward pressure across full width of reel to retain hose on reel when encountering nozzle blockages. Pinch roller must be activated via a one touch, backlit button with lighted feedback on the control panel.	Yes	
Digital footage counter displaying footage values shall be provided. System must be capable of resetting value to ensure operator safety. Accuracy To Within One Percent Of Actual Distance, Large Easy To Read Lcd Screen located on the front control panel screen.	Yes	
10' Leader Hose	Yes	
<b>WASHDOWN EQUIPMENT</b>		
A handgun with 1/2" x 35' hose shall be provided at mid-ship to which allow the operator to deliver water to area served by pick up hose and to the inside of the debris body for clean out.	Yes	
Hand sprayer with adjustable spray-pattern to be provided with trigger-style gun.	Yes	
<b>FRONT OPERATING STATION AND CONTROLS</b>		
Primary operator station will be located at front of hose reel.	Yes	
All operator controls should be located on a single control panel that can be rotated on a 90 degree arc for an operator customizable location. The control panel shall also feature the ability to raise and lower to accommodate operators of different height.	Yes	
Station shall include a 7" Touch enabled display screen with corresponding tactile buttons for reading critical machine data including ( hose footage, hose reel speed settings, water pressure, water flow. Air mover information, chassis data, mode indicator, chassis fuel level, and diagnostic controls), Back lit button keypads with, laser etched function icons, and 4 light feedback indicators. These buttons shall operate the following functions: All setup functions (remote/panel selector, work lights, hose reel extend/retract, hose reel lock, and pinch roller activation) and Vacuum functions. Additionally, there will be separate sealed rocker switches for Water Pump on/off and Throttle up/down. There shall be a multi flow control dial for controlling the full range of the water pump.	Yes	
There shall be a hose reel joystick to control the pay in and pay out of the hose reel, this joystick shall offer speed control that increases the further the joystick is moved in either direction. There shall be an additional hose reel speed dial for setting specific speed ranges of the reel. There shall be a boom joystick that controls all function of the boom including up/down, left/right, and extend/retract. There shall be a E-Stop button to bring the machine to safe operating condition	Yes	
Tachometer and hour meter for chassis engine provided at control station shall be provided.	Yes	
Tachometer and hour meter for blower provided at control station shall be provided.	Yes	
All Hydraulic Functions - Color Coded, Sealed Electric/Hydraulic NEMA 4 switches shall be provided.	Yes	
Blower Engagement/Vacuum Relief - Sealed Electric/Air NEMA 4 Switch shall be provided.	Yes	
Water pump hour meter shall be provided.	Yes	
PTO hour meter shall be provided.	Yes	
A temperature light and alarm shall be provided. Light and alarm will be activated when hydraulic temperature reaches 180 F.	Yes	
Front control screen shall display a water level indicator to show level of water through the range of the tank.	Yes	
Front control screen shall display the debris body level.	Yes	
<b>IN CAB CONTROLS</b>		
All In cab controls are to be located on a single in cab control screen. This shall be a full color	Yes	

display screen. It shall utilize 12 back lit tactile (glove ready) buttons on the sides of the screen as well as feature touch screen operation.	Yes	
All Back up camera Features shall be displayed on the In Cab Control Screen.	Yes	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Yes	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Yes	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Yes	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Yes	
All work lights shall be able to be activated or deactivated in cab with on screen controls.	Yes	
All standard arrow boards or arrow stick shall be controlled via an on screen controller	Yes	
All safety strobes and beacons shall be controlled via on screen controller	Yes	
Jet or Combo mode shall be activated via one touch button on the control panel. Control screen must display an on screen representation of the chassis drive system and must animate to show as drive systems activate or deactivate.	Yes	
Recirculation must be activated on the in cab control screen and visibly show that it is active at all times.	Yes	
<b>ELECTRICAL &amp; SAFETY LIGHTING</b>		
The entire system shall be vapor sealed to eliminate moisture damage, "Nema-4" type or equal.	Yes	
Logs, reports, and hour meters will be accessible via the display.	Yes	
All electrical connections shall be void of exposed wires or terminals nor should they be painted. Paint process shall be completed prior to installation of wiring.	Yes	
All wiring shall be color-coded and encased in conduit to scaled terminal boxes with circuit breakers.	Yes	
All other lights required by State and Federal Laws.	Yes	
One-piece directional 10-light arrow board (Signal Master or equal) shall be mounted on rear door of debris body, with controls mounted in cab.	Yes	
Handheld, Pistol Grip LED Spot light with rechargeable Lithium Ion battery.	Yes	
Operator station shall have back lit buttons for low light operation.	Yes	
Hose reel manhole work lights shall be provided	Yes	
(2) L.E.D. Boom work lights shall be provided.	Yes	
L.E.D. Work light at midship curbside shall be provided.	Yes	
L.E.D. Work light at midship street side shall be provided.	Yes	
(2) L.E.D. Rear door work lights shall be provided	Yes	
L.E.D. Lights, Clearance, Back-Up, Stop, Tail & Turn shall be provided.	Yes	
Mid-Ship L.E.D Bubble Type Turn Signals Shall be Provided	Yes	
<b>SAFETY EQUIPMENT</b>		
E-stop shall be located at each operator interface location. Standard locations to include: front hose reel, mid-ship curbside dump controls, & wireless controller (if equipped.)	Yes	
Electrical system controls shall be configured to allow for single point operation only. Upon engagement of controls at specified locations, additional controls shall be disabled.	Yes	
Electrical system must enable self-check to ensure all switches are in home position prior to critical function enablement. System must "lock out" controls when switch is not in home position.	Yes	
Rear work lights shall be activated upon engagement of reverse gear.	Yes	
(1) Emergency Flare Kit	Yes	
(1) 5# Fire Extinguisher.	Yes	
7" dash monitor, 2-camera system shall be provided. A Front Hose Reel Color Camera with 130 degree Viewing Angle shall be provided to provide a front visual of the manhole cover to aid in equipment set-up. A rear back-up color camera with 130 degree viewing angle shall be provided. Camera to have automatic activation when the unit is switched to reverse.	Yes	
The unit shall utilize a high temperature monitoring safety device to automatically disable the vacuum system when the outlet temperature of the positive displacement blower reaches a high temperature limit.	Yes	

Digital water pressure shall be displayed in front LCD display. Pressure gauge shall be capable of displaying water system pressure in all pump operating modes.	Yes	
<b>SEWER TOOLS AND ACCESSORIES</b>		
(1) 30 Sand Nozzle	Yes	
(1) 30 deg. Sanitary Nozzle	Yes	
(1) 15 deg. Penetrator Nozzle	Yes	
(1) 1" Small finned nozzle pipe skid	Yes	
<b>VACUUM TOOLS AND ACCESSORIES</b>		
The basic vacuum tube package shall include the following:	Yes	
(1) 8" x 3' aluminum pipe	Yes	
(2) 8" x 5' aluminum pipe	Yes	
(1) 8" x 6'6" catch basin tube	Yes	
(4) 8" quick clamps	Yes	
<b>CHASSIS EQUIPMENT AND STORAGE</b>		
Two (2) front tow hooks shall be provided.	Yes	
Two (2) rear tow hooks shall be provided.	Yes	
A safety cone storage rack shall be provided to contain safety cones in the inverted position.	Yes	
Aluminum Toolbox - Behind Cab	Yes	
(1) 18" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.	Yes	
(1) 48" x 22" x 24" Aluminum Toolbox Mounted curb side shall be provided.	Yes	
(2) 18 In. x 16 In. x 12 In. Aluminum Toolbox - Front Bumper shall be provided.	Yes	
(1) 60" x 24" x 24" Aluminum Toolbox Mounted street side shall be provided.	Yes	
(4) Long Handle Tool Storage Locations Behind Cab shall be provided	Yes	
<b>MODULE FINISH</b>		
Painting of the module shall be with a DuPont Imron Elite Polyurethane Enamel Top Coat. Application is to be a wet top coat applied to a dried and sanded primer base.	Yes	
<b>CHASSIS SPECIFICATION</b>		
The unit shall be a new model. No discontinued models will be accepted	Yes	
Freightliner 114SD Conventional Cab Chassis	Yes	
The unit shall be equipped with a diesel engine, turbo charged and after cooled, with a Detroit Diesel 13 12.8L; 435 HP @ 1800 RPM, 1650 LB/FT @ 1100 RPM	Yes	
Set Forward Axle	Yes	
The unit shall be equipped with an Allison 4000 RDS Automatic Transmission with PTO Provision	Yes	
The unit shall be equipped with a Meritor MFS-20-133A 20,000# Wide Track, I-Beam Type Single Front Axle	Yes	
The unit shall be equipped with a 20,000# Flat Leaf Front Suspension	Yes	
The unit shall be equipped with a Meritor RT-46-160P 46,000# R-Series Tandem Rear Axle	Yes	
The unit shall be equipped with a 46,000# Hendrickson RT463 Rear Suspension	Yes	
The unit shall be equipped with a 114 inch BBC flat room aluminum conventional cab	Yes	
The unit shall have a wheelbase of 277 inches	Yes	
The unit shall have a 7/16 x 3-9/16 x 11-1/8 inch steel frame with 120 KSI rating	Yes	
The unit shall have a 1/4 inch C-Channel inner frame reinforcement	Yes	
The unit shall have a 71 inch rear frame overhang	Yes	
The unit must be capable of fuel dosing of after treatment enabled in PTO mode-cleans hydrocarbons at high temperatures only.	Yes	
Unit must be equipped with air actuated rear axle lockers on one switch, and inter axle cross locking on other switch, to lock in both of the tandem axles (DCDL/IAD)	Yes	
The unit must be compliant with all DOT and FMCSA regulations.	Yes	
<b>ADDITIONAL PARTS</b>		
(1) 8" x 3' Aluminum Vacuum Tube	Yes	
(1) 8" x 5' Aluminum Vacuum Tube	Yes	

(1) 8" x 7'-6" Aluminum Vacuum Tube	Yes	
(1) 8" x 78" Higbee C/B Nozzle Assembly	Yes	
(6) 8" Quick Clamp Assembly	Yes	
(1) 8" Adjustable Air Adapter	Yes	
(1) Flexible Hose Guide	Yes	
<b>DEALER</b>		
Equipment dealer must be within 40 miles of Merrimack Water Treatment facility.	Yes	
Equipment dealer must have road trucks available for travel to customer's site	Yes	
Parts must be in stock at dealer's location, and on occasion from manufacturer within 48 hours	Yes	
Equipment dealer must have been representing offered product for over 20 years	Yes	
Dealer must have over 50 units of the model offered out in the field	Yes	
<b>Warranty</b>		
Extended warranty on emissions system pricing to be included in bid package (pricing for all warranty periods offered to be included with bid package.)	Yes	
Warranties to be included in bid package on all aspects of Unit. Listed out in individual line items for clarity.	Yes	
<b>Training</b>		
Training in the operations and maintenance of the unit to be included.	Yes	