

TRAILER MOUNTED SEWER CLEANER

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YES **NO**

Please check "YES" or "NO" for each item below. Items checked "YES" must meet specifications exactly. For all items checked "NO", please clearly note differences on a separate sheet of paper. The City reserves the right to review exceptions and judge the possibility of their acceptability. Failure to note exceptions will cause rejection of said bid.

A. GENERAL:

It is the intent of these specifications to describe the minimum requirements for a new High Pressure Water Jet designed for the removal of sand, dirt, grease, detergents, and other materials normally found in storm, drain and sanitary pipes. The machine described will be designed to deliver high performance capabilities and provide maximum safety and convenience. All parts not specifically mentioned which are required for complete unit shall conform in design, strength, quality of material, and workmanship to the highest standards of engineering practice.

B. WATER TANK SYSTEM:

- ___ 1. Total capacity of tanks shall be 700 gallons with each tank having a capacity of 350 gallon. 700 gallon tanks consisting of a single chamber are not acceptable due to excessive water surging while driving.
- ___ 2. Tanks shall be constructed of 3/8" thick High Density Polyethylene. This polyethylene material shall be U.V. stabilized for protection against damaging ultraviolet rays.
- ___ 3. Tank color shall be black to minimize light penetration that can cause growth of algae. Clear or translucent tanks are not acceptable.
- ___ 4. Tank shall be vented and have a tank top porthole to permit inspection and cleaning of tank. The porthole will have a two part lid which provides a smaller opening for filling or with a complete removal of lid allowing for a larger opening for tank cleaning and inspection. The tank will have a 2" drain valve located at the front of the trailer.
- ___ 5. Tanks constructed of steel will not be acceptable due to the potential of water pump damage by rust and corrosion particles.
- ___ 6. Tanks must be secured with a resilient nylon strap that wraps around tank. Bolt on tanks or tanks secured with metal straps will not be accepted.

C. FILL SYSTEM:

- ___ 1. An overhead type tank filling assembly with a 2-1/2" fire hydrant fitting shall be located on the curbside.
- ___ 2. A positive air gap anti-siphon system shall be incorporated to protect the potable water foreign objects into the tank.
- ___ 3. A tank top strainer will also be supplied to filter water supply.
- ___ 4. A water level sight gauge shall be provided.

D. WATER PUMP:

- ___ 1. Pump shall be positive displacement, heavy duty, and single acting triplex type having a capacity of at least 40 GPM at 2000 PSI
- ___ 1a. Upgrade water pump to 40 GPM at 3000 PSI.

- 2. The high-pressure pump and hose will be protected from freezing with an air purge valve.
- 3. As standard equipment, the unit will have a recirculating valve that allows the operator to run water through the entire jetting system during cold weather operation.
- 4. Pump suction to be constructed of corrosion resistant PVC piping with integral "Y" strainer for protecting the pump.
- 5. The water pump shall be equipped with drain valves for protection during freezing conditions.
- 6. Pump drive belt must be equipped with a safety guard.
- 7. Engine speed for 40 GPM / 2000 PSI pump shall not exceed 1500 RPM.
- 8. Engine speed for 40 GPM / 3000 PSI pump shall not exceed 1800 RPM.

E. ROTATING SAFETY HOSE REEL AND CONTROLS:

- 1. Capacity of reel shall be 800' x 3/4" high pressure sewer hose.
- 2. The hose reel will be constructed of 1/4" steel, designed to withstand maximum working pressure without distortion.
- 3. Reel flanges shall be 1-1/2" and shall be designed to prevent hose damage from contact during all normal working conditions.
- 4. The design of the reel shall include a minimum 1/4" deep "shoulder" machined into the shaft that traps the reel between the bearing blocks on the either side of the reel. This shoulder shall minimize side-to-side movement of the reel and prevent the shaft from sliding out from the reel and creating a safety hazard. In addition, the shoulders shall improve the ability of the system to handle any thrust loadings on the reel assembly.
- 5. The reel shall be an enclosed structure with no moving parts and no hoses exposed to the outside of the reel. This will protect the hoses and minimize the chance of injuries due to moving parts. Exposed hoses shall not be acceptable.
- 6. All hoses used to supply the hose reel or its hydraulic system shall be flexible and shall be fully enclosed in a shroud and routed underneath the reel structure below the reel drum. The hoses shall be fully secured and protected against chafing and rubbing.
- 7. The center of the reel shall include at least three baffle structures that reinforce the center of the drum. The reel shall be specially designed to handle all the loads that have been measured during cleaning operations, including the pull force from the operation of the nozzle, and the compressive forces from the pressurization of the hose.
- 8. The reel shall be driven with hydraulic power in both directions, either with or without the water pump in operation. The hydraulic drive shall have sufficient power to retract the hose when fully extended into the pipe with the cleaning nozzle in operation.
- 9. The safety reel will rotate a full 190 degrees providing easy access to manholes. The 190 degree rotation will enable the operator to position the machine out of the traffic pattern and provide protection for himself while operating the machine. The rotating ability of the hose reel allows the operator to manipulate the hose reel into various positions depending on location of manhole. This allows for proper positioning of the hose reel without backing up or repositioning sewer machine. The hose reel is mounted on an industrial swivel bearing that is sealed and eliminates contamination from dirt. This industrial swivel bearing shall have minimum requirements of 7.88 I.D., 14" O.D., and 2" thickness. The industrial swivel bearing shall have a minimum load bearing weight of 5,000 Ft.-lbs. The bearing design shall have no wear points except the greasable ball bearings and the races, which are constructed of hardened steel to minimize wear. The bearing design minimizes any friction for easy pivoting. The rotating hose reel will lock into position using a spring-loaded safety pin at 2" intervals.
- 10. Rotating reels using plastic material and/or sliding contact or other wear surfaces for swivel action will not be accepted.
- 11. A single, right hand side control panel mounted on the rotating hose reel shall provide access to all necessary operating controls. The control panel shall rotate with the reel. Designs that position controls on the left/traffic side of the jetter are not acceptable.

- 13. Controls mounted on the rotating hose reel control panel will consist of: Engine throttle control, starter with key lock starting switch, volt meter, oil pressure gauge, water pressure gauge tachometer, hour meter, 12-volt plug for spotlight, light switches and low water warning light.
- 13b. The hose reel controls will include the Electronic Throttle Control.
- 14. The hydraulic controls for the rotating hose reel will consist of: a variable speed control and a forward, neutral, reverse directional control.
- 15. The reel design shall be such that either a rotating or fixed position reel will be interchangeable with regards to the method of attaching to the trailer.
- 16. The Sewer Hose reel shall be equipped with a manual level wind.
- 17a. The unit will be supplied with a Footage Meter mounted on the hose reel
- 18. Decibel level at operator station to be no greater than 83 dB for 40 GPM / 2000 PSI water pump
- 19. Decibel level at operator station to be no greater than 85 dB for 40 GPM / 3000 PSI water pump
- 19. System will be equipped with 500 feet of 3/4" ID hose rated for 3000 PSI service.

H. HYDRAULIC SYSTEM:

- 1. The hydraulic power system for driving the units systems shall consist of a pump directly driven by an auxiliary engine.
- 2. The hydraulic pump shall have a minimum operating capacity of at least 8 GPM and a tank with a strainer that can be cleaned or replaced as well as an inspection port.
- 3. Shut-off valves will be installed on the suction lines to facilitate servicing of the hydraulic pump without the need of draining.

I. HAND GUN CLEAN UP:

- 1. The clean-up systems will include a wash-down gun, 25' of 1/2" ID hose and will be equipped with a quick-disconnect fitting near the operator's station.
- 2. The gun shall be a machine grip with trigger shut-off and guard.
- 3. The high-pressure hose shall have a rating of 2,000-PSI working pressure and an 8,000 PSI burst pressure.
- 4. The cleaning system shall have its own relief set at 500 PSI.

J. PIPING:

- 1. All piping systems subjected to high pressure shall use zinc chromate plated steel fittings with minimum burst pressure of four times the system pressure. Hoses working pressure ratings shall exceed the maximum system pressure.
- 2. A "Y" strainer with a minimum of 40-mesh screen shall be installed in the PVC suction line at a location accessible for cleaning.
- 3. All piping shall be installed to drain by gravity through suitable openings equipped with plugs, drain cocks, or ball valves.
- 4. Pressure to the cleaning nozzle, shall be regulated by an overload relief valve.
- 5. To control water flow from water pump, a single lever control shall regulate direction of water either to hose reel or back to tank utilizing a high-pressure valve assembly. This single lever control shall control a 3-way valve.
- 6. The recirculation ability of this system allows for use of unit in sub-freezing temperatures.
- 7. Water delivery to hose reel shall pass through a single 90-degree swivel rotary coupling.

K. ENGINE:

- 1. The engine shall be diesel powered, water-cooled, four cylinder type with industrial type governor, air cleaner and muffler. The engine has an 91 horsepower rating. The engine drive assembly must be designed so that it maximizes the horsepower and torque of the engine while reducing the wear on the engine.
- 2. The required engine accessories shall be furnished, including, but not limited to:
 - 12-volt ignition system with alternator and battery
 - Vernier throttle control
 - Starter with key lock starting switch
 - Replaceable cartridge type oil filter
 - Positive crankcase ventilation system
 - Tachometer and hour meter
 - Voltmeter, oil pressure gauge, and water temperature gauge
- 3. The engine shall be equipped with an automotive style clutch with a spring loaded pressure plate and self-sustaining lever operator for positive engagement of water pump. The clutch engage must be located at the operator's station. This clutch shall have a lifetime warranty which excludes wearable parts.
- 4. Power band belt, from engine sheave to pump sheave, is adjustable by movement of water pump.
- 5. The engine fuel tank will have a capacity of 16 gallons and will be mounted below the frame for safety.
- 6. There shall be a Two (2) year warranty on engine.
- 7. Fuel consumption for 40 GPM / 2000 PSI water pump to be no more than 3.25 Gal/Hour
- 8. Fuel consumption for 40 GPM / 3000 PSI water pump to be no more than 3.65 Gal/Hour
- 9. Engine and pump shall be mounted on an independent subframe to assure optimal belt and sheave alignment.
- 10. Engine shall have integral low oil pressure/high water temp shutdown systems. Murphy switches or any other mechanical switches are not acceptable.

L. PUMP & ENGINE SHROUD:

- 1. The water pump and auxiliary engine will be fully enclosed in the same compartment. The shroud design of the trailer jet shall be constructed of painted steel and will allow for ease of maintenance and for protection against pilferage and inclement weather. The shroud shall be a one-piece welded construction of steel to eliminate any potential for fastener breakage or rust streaking from bolts or their holes. Bolt-together shrouds are not acceptable. The shroud shall be flexibly mounted to the trailer frame via elastomeric mounting pads, which will allow the shroud to float as well as eliminate any nuisance rattles. The shroud shall include three (3) fully hinged access doors that are locking and keyed alike. These doors shall be fully recessed for optimum aerodynamics as well as allow for the protection of interior components from weather and vandalism. Door hinges shall be constructed of stainless steel and bolted to the shroud. Ventilation in the above doors shall be via louvered openings again to maintain optimum aerodynamics as well as resistance to weather infiltration.
- 2. Units with only top shrouding and without locking doors will not be accepted.

M. TRAILER:

- ✓ 1. The trailer manufacturer must be a National Association of Trailer Manufacturers (NATM) member. The trailer must be certified by NATM to have been manufactured in accordance with NATM guidelines. NATM member products are regulated by two sections in the Department of Transportation (DOT); primarily the National Traffic and Safety Administration (NHTSA), and secondarily, the Federal Motor Carrier Safety Administration (FMCSA). Both of these regulatory bodies develop regulations concerning trailer safety. Trailer must display NATM sticker indicating compliance.
- ✓ 2. The frame shall be heavy gauge steel tubing construction. The outer frame being of a 2" x 6" construction with a 2" x 4" 'spine' running beneath the reel and water tank areas. Steel thickness on frame tubes shall be minimum of 1/4".
- ✓ 3. The frame shall utilize a modular design (Vari-Flex or equal) approach such that the unit will accept any alteration of hose reel assembly or pump and engine combination without ANY welding. All future product upgrades for hose reel and/or pump and engine combinations MUST bolt in to the existing unit for purposes of easy upgrade-ability.
- ✓ 4. Unit will be equipped with complete ICC light group, reflectors, license plate holder and safety chains.
- ✓ 5. Unit will be equipped with two (2) 7,000 lb. capacity leaf spring axles. Torsion suspension will not be accepted.
- ✓ 6. Unit will be equipped with four (4) radial tires.
- ✓ 7. Trailer unit will be equipped with heavy-duty fenders, triple tube tongue, 2-5/16" ball type hitch, and electric brakes with break away switch.
- ✓ 8. Trailer shall have bolt on fenders to facilitate easy replacement in the event of damage. Weld on fenders are not acceptable.
- ✓ 9. Wheels will be billet aluminum construction.

N. TOOL STORAGE:

- ✓ 1. Unit will be equipped with a fender mounted, heavy-duty 16-gauge steel toolbox with keyed lock system for storage of nozzles and valuable hydraulic root cutting tools.
- ✓ 2. Toolbox will measure 12-3/4" high by 32-7/16" wide by 11-1/4" deep.
- ✓ 3. Weather stripping will protect toolbox from intrusion of water.

O. PAINTING:

- ✓ 1. Before painting, all metal shall be cleaned and etched with a phosphoric wash to insure permanent bond of primer and paint.
- ✓ 2. All components of the unit whether purchased or manufactured shall be BOTH primed and painted prior to assembly in order to assure maximum resistance to corrosion. Painting after the assembly process is NOT acceptable.
- ✓ 3. The unit shall have the trailer frame painted black and the hose reel and shroud assemblies shall be painted standard white.

P. ELECTRICAL:

- ✓ 1. All switches and/or engine controls shall be housed in a NEMA 4 enclosure to insure maximum protections against the elements.
- ✓ 2. NEMA 4 enclosures that need to be opened to access operation switches and levers are not acceptable.
- ✓ 3. All electrical connections shall be made via water-tight NEMA 4 equivalent splices. All splices shall be soldered and insulated with shrink tubing.

- 4. Tail lights shall be recessed in the trailer frame for maximum protection from damage as well as resistance to road vibration. Tail lights mounted to fenders or protruding from the face of the trailer frame are NOT acceptable.
- 5. The main power supply shall have circuit protection and come direct from the unit's battery. All functions shall de-energize when the ignition switch is turned off. The ignition switch shall be used to energize various relays but not as a main power source.
- 6. A dedicated ground shall be supplied to the control panel to assure a positive ground for all devices. Local grounding of the devices is not acceptable.
- 7. All electrical wiring shall be protected by suitable loom.
- 8. The lighting system and all other components shall meet all applicable standards.
- 9. Manual shall include "as built" wiring diagram. Generic wiring diagrams are not acceptable. All wiring must be color coded to aid in trouble shooting.
- 10. All trailer lighting shall be LED.

Q. GUARANTEED BUY BACK

- 1. The trailer jetter manufacturer is to provide the City of Social Circle with a guaranteed buy-back after specified years of operations, based upon a percentage of the original purchase price. This agreement is not predicated on the City of Social Circle purchasing a new machine at the end of the specified period. The City has no restrictions or limitations governing the operation hours for this unit provided that scheduled maintenance is performed and service records are maintained. The jetter manufacturer expects normal wear and tear on the trailer jetter. The trailer jetter should be in operational condition and roadworthy to the point of passing a DOT inspection (i.e. working brakes, lights, wheels, etc.).
5 Years - 50%, 6 Years - 45%, 7 Years - 40%, 8 Years - 35%

R. STANDARD ACCESSORIES:

- 1. Finned style nozzle extension
- 2. Tri-Point (chisel) Nozzle with Ceramic Inserts
- 3. HW-70 (high-flow) Nozzle with Ceramic Inserts
- 4. Nozzle Rack
- 5. 25' Fill hose
- 6. Leader Hose
- 7. BB hose guide
- 8. Upstream pulley guide
- 9. Wash-down gun with 25' x 1/2" extension hose, storage rack for wash down, tigertail, and upper manhole roller
- 10. Paper Operator's manual
- 11. Lighted control panel

S. ADDITIONAL ACCESSORIES:

- 2. Lateral Line cleaning kit (150' x 1/2" hose with nozzle mounted on a rolling cart, with shutoff).
- 3. Fill Hose storage rack.
- 4. Additional paper Operator's Manual
- 5. CD-ROM Operator's Manual

T. LIGHTING ACCESSORIES:

- ✓ 1. Strobe light mounted on top of engine compartment
- ✓ 2. LED stop-turn-tail and marker lighting