TRUCK MOUNTED SEWER JETTER

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 materials normally found in storm drain and sanitary pipes. The machine described will be designed to deliver high performance capabilities and provide maximum operator safety and convenience. All parts not specifically mentioned which are required for a complete unit shall conform in design, strength, quality of material, and workmanship to the highest standards of engineering practice.*

*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.*		**YES**	**NO**	**COMMENTS**
A. CHASSIS FREIGHTLINER				
1.	Cummings Diesel Motor rated for 7000' elevation	X		
2.	7 way blade trailer plug	X		
3.	Trailer brake	X		
4.	Hitch pintail ball style rated for truck towing capacity	X		
5.	Lockable master switch	X		
6.	All LED lighting	X		
7.	Rear door open indicator	X		
8.	(Third eye) Back up camera and forward dash camera recordable for 12 hours SD card	X		
9.	Sight glasses on Gear Cases	X		
10.	Back up alarm	X		
11.	AM FM radio Blue tooth for cell phone hands free.	X		
12.	Same size tires - All tires shall be the same size.	X		
13.	Tow hooks rated for truck recover	X		
14.	Spare tire	X		
15.	Fire extinguisher and triangle mounted	X		
B. WATER TANK:				
1.	Tank shall be constructed of welded/repairable .750", 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 1500 gallons of water with two interconnected 750 gallon tanks. The tanks shall be interconnected within the heated compartment with a 4" crossover pipe. The baffles in the tank will be constructed of .750" 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. Entire tank top shall be completely removable for safe access of personnel entry during maintenance. Tanks shall have 2" drain valves located at both the curb side and street side.	X		
1a.	***Optional -** Total tank capacity to be increased to 2000 gallons.	X		see options quote #14773
2.	Tanks constructed of steel will not be acceptable due to the potential of water pump damage by rust and corrosion particles.		X	Tanks will be Duraprolene
3.	Tanks constructed of polyethylene will not be acceptable due to inadequate UV protection and lack of repairability.		X	Tanks will be Duraprolene
C. FILL SYSTEM:				
1.	Tank filling shall be possible from both curbside and street side.	X		
2.	Tank filling system and fill hose will be located between the cab and water tank of the unit with a fill point on both sides of the truck.	X		
3.	Tank fill system shall utilize a quick disconnect cam lock fitting for 2-1/2" fill hose.	X		
4.	The water tank shall have a LED Level Indicator that uses pressure transducers. The Indicator will feature nine (9) easy to see super bright LEDs with a wide view lens over the LEDs to provide a viewing angle of 180 degrees. Low Water warnings shall include flashing LEDs at 1/4 tank, and down chasing LEDs when the tank is almost empty. The Indicator case shall be waterproof, manufactured of aluminum, and have distinctive blue label. The indicator shall be programmable from the display and shall support self-diagnostics capabilities, self-calibration, and a data-link to connect remote indicators. Water Level Indicators that use float sensors will not be acceptable.	X		
5.	A water level sight gauge will be located on street side and on curbside.	X		
6.	A four-inch (4") air gap will be utilized between fill pipe and tank fill opening. The gap will utilize a stainless steel ball float/seating system. The float system is completely rust proof and provides the needed space between the inlet and the tank to protect from siphoning and back flow during hard stops.	X		
7.	***Optional -** Tank shall utilize an Automatic Fill/Shut Off system.	X		see options quote #14773
8.	Tank shall be supplied with a Fill Hose storage rack.	X		
D. WATER PIPING SYSTEM:				
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.	X		
2.	A strainer with a minimum of 40-mesh screen shall be installed in the suction line at a location accessible for cleaning.	X		
3.	All piping shall be installed to drain by gravity through suitable openings equipped with plugs, drain valves, or ball valves.	X		
4.	Pressure to the cleaning nozzle, shall be regulated by an overload relief valve.	X		
5.	The water supply for jetting shall be directly controlled by the water pump. No water diverter or directional valves are allowed due to significant wear issues at said valves.	X		
6.	Unit shall include a recirculation system that controls a proportional pump control with the ability to circulate a minimum of 10 gallons per minute of water. This system allows for use of unit in sub-freezing temperatures. A control for the recirculation system will be located in the cab.	X		
7.	Water delivery to hose reel shall pass through a single repairable/greaseable 90-degree swivel rotary coupling.	X		

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E. WATER PUMP:				
1.	Triplex plunger style Giant pump with 30 minute run dry rated at and powered to produce 65 GPM at 2000 PSI.	X		
1a.	***Optional -** Upgrade to pump rated at and powered to produce 80 GPM at 2000 PSI.	X		see options quote #14773
1b.	***Optional -** Upgrade to pump rated at and powered to produce 80 GPM at 2500 PSI.	X		see options quote #14773
1c.	***Optional -** Upgrade to pump rated at and powered to produce 55 GPM at 3000 PSI.	X		see options quote #14773
2.	Water pump will be located in the rear compartment, which is shrouded and heated to protect the pump from the dangers of any damage caused by freezing.	X		
3.	The water pump must be located with liquid end facing out. This prevents the mechanic from getting in unit to do pump service work. This allows servicing the pump at ground level.	X		
4.	Pump to be fitted with drain valves for complete draining of water pump.	X		
5.	The water pump shall be direct coupled to a hydraulic motor. Drive systems incorporating any type of flexible coupling or belt drive system are not deemed acceptable due to maintenance related issues.	X		
F. HYDROSTATIC DRIVE SYSTEM:				
1.	The water pump will be driven by a hydrostatic system, which is powered by the truck engine via a PTO mounted to the transmission. The PTO drives a shaft, which powers a hydrostatic transmission pump. This hydrostatic transmission pump is responsible for driving a hydraulic motor, which drives the water pump. Mounted to the hydrostatic pump is a hydraulic pump, which is responsible for supplying power to all hydraulic functions including the hydraulic motor that drives the hose reel. The hydrostatic pump control must use a proportional spool type control. Proportional pump control must be electronically controlled by two separate signals. One signal to be used to stroke hydrostat to full capacity. The second signal to be used for recirculation mode. Cable or manual pump controls are not allowed.	X		
2.	The chassis engine speed will operate in a range of 1400 to 2000 RPMs depending on pump configuration to power the hydrostatic transmission.	X		
3.	The hydraulic oil reserve capacity will be at least thirty (30) U.S. gallons with oil temperature indicator. This unit will also be equipped with low hydraulic oil indicator light located at the operator's station to signal loss of hydraulic oil. The return line hydraulic filter shall be cartridge style and integral to the reservoir.	X		
4.	The hydraulic oil shall be cooled by a high efficiency shell and tube heat exchange system. Any oil cooling system that employ devices with moving parts shall not be acceptable.	X		
5.	Shut-off valves will be installed on the suction lines of facilitate servicing of the hydraulic pump without the need of draining.	X		
6.	The hydraulic system shall have an emergency shut-down that automatically reduces the engine speed to idle eliminating the potential for damaging the PTO. When the shut-down switch is disengaged, the PTO will re-engage and operator can ramp back up to operating speed.	X		
7.	The hydraulic oil reservoir, water pump, and rear hydraulic motor are to be mounted above the chassis frame rails in the enclosed, heated pump compartment located at the rear of the water tank. The reservoir shall have a protected Sight Glass Unobstructed for manual inspection.	X		
8.	***Optional -** The Hydraulic oil must be non-toxic and inherently biodegradable.	X		see options quote #14773
9.	The hydraulic system will include a Hydraulic Tool Circuit (rated at 9.5 GPM @ 2000 PSI). System will incorporate a supply and return quick connect on the curb side of the unit as well as a manual diverter valve for the tool circuit on/off.	X		
H. HIGH PRESSURE HAND GUN SYSTEM:				
1.	The high-pressure handgun piping shall be provided as standard with quick-disconnect fitting located at curb side and 50' of 1/2" HP hose with fittings. Mounted on a Retractable reel.	X		
1a.	Upgrade to 50' of 1/2" HP hose with fittings mounted on retractable reel.	X		
2.	High-pressure handgun circuit shall utilize an adjustable relief valve capable of 500-PSI capacity.	X		
3.	The high-pressure handgun will be adjustable and repairable.	X		
I. ROTATING SAFETY HOSE REEL AND CONTROLS:				
1.	Capacity of reel shall be minimum of 700' x 1" high pressure sewer hose.	X		
1a.	***Optional -** Capacity of the reel shall be a 1000' x 1" high pressure sewer hose.	X		see options quote #14773
2.	The narrow designed reels shall be self-leveling type for operator safety.		X	we do not supply narrow design reel
3.	The hose reel will be constructed of 1/4" steel, designed to withstand maximum working pressure without distortion.	X		
4.	Reel flanges shall be 1-1/2" and shall be designed to prevent hose damage from contact during all normal working conditions.	X		
5.	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.	X		
6.	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.	X		
7.	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.	X		
8.	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.	X		
9.	The reel shall be driven with hydraulic power for pay out and retrieve, 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.	X		
10.	The hose reel assembly shall be mounted in the rear center of the rear compartment.	X		
11.	The hose reel shall have the ability to extend out from the rear compartment via a hydraulically powered cylinder.	X		
12.	The cylinder shall extend the hose reel 48" from the fully retracted position in the heated rear compartment after the rear roll-up door has been completely opened.	X		

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13.	The safety reel will rotate minimum 180 degrees providing direct alignment to manholes. The 180 degree rotation will enable the operator to position the machine operator out of the traffic pattern and provide protection for themselves 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 greaseable 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.	X		
13a.	***Optional -** Upgrade to a Hydraulically Powered Rotating Hose Reel with 190 degree powered hose reel rotation via hydraulic slew drive. Reels utilizing chain and sprockets and hydraulic cylinders are not acceptable.	X		see options quote #14773
14.	Rotating reels using plastic material and/or sliding contact or other wear surfaces for swivel action will not be accepted.		X	Swivel action will be of above bearing design
15.	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.	X		
16.	Controls mounted on the rotating hose reel control panel will consist of: Engine throttle control, water pressure gauge, tachometer, hour meter, 12-volt plug for spotlight, light switches and low water warning light. Footage meter	X		
17.	The hydraulic controls for the rotating hose reel will consist of: variable speed control and a forward-neutral-reverse directional control.	X		
18.	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 frame.	X		
19.	The Sewer Hose Reel shall be equipped with a manual level wind.	X		
19a.	***Optional -** The Sewer Hose Reel shall be equipped with an Automatic Level Wind, which allows for "hands-free" winding of sewer hose onto the hose reel without operator touching sewer hose. This option will incorporate a drive system, which scrolls a pivoting four roller head back and forth across the hose reel for proper winding of sewer hose onto reel. The system is equipped with a hydraulic controlled elevation system, which incorporates dual cylinders and a pivot arm to raise and lower the level wind guide depending on location of manhole. Level Wind raises/lowers minimum of 45 degrees.	X		see options quote #14773
20a.	The unit will be supplied with a Footage Meter mounted on the Hose Reel.	X		
20b.	***Optional -** The unit will be supplied with a Footage Meter mounted on the Level Wind.	X		see options quote #14773
J. HOSE REEL DRIVE SYSTEM:				
1.	The hose reel shall be chain driven by 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 sewer with the cleaning nozzles in operation.	X		
2.	A hydraulic pump rated at 0-8 GPM at 2000 PSI will power the hose reel drive. A hydraulic motor with chain drive and sprocket capable of operating in both directions will be furnished. The hydraulic motor and chain must be adjustable.	X		
3.	The hydraulic drive for the reel will be furnished with an overload relief valve.	X		
K. OPTIONAL SEWER HOSE:				
1.	Hose will be 1" ID with an operating pressure of 2500 PSI and a minimum burst pressure of 7500 PSI.	X		600' included
1a.	***Optional -** The unit will be supplied with an abrasion resistant plastic **(Armor Belt)** sewer cleaner hose capable of cleaning sanitary service lines, storm lines, culverts, drainage tiles and other open conducts. The hose outer cover will contain an integral belting of high tensile polymer reinforcement for cut and abrasion resistance.		X	no longer available
L. CONTROLS:				
1.	***Optional -** The unit will be supplied with a **STANDARD** pendant control with 35' cord for ease of operator use when manhole is not adjacent to unit. The pendant shall be tethered to control panel via a quarter turn, military grade quick connector. The tether cable shall be constructed of Teflon coated, multi-wire color-coded control cable. The pendant controls shall be in a NEMA 4 housing and will use watertight toggle controls and shall be labeled with permanent labels for identifying each function. The pendant control will include controls for the hose reel pay out and retrieve, throttle up/down, and kill switch.	X		see options quote #14773

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2.	The unit will be supplied with a **CORDLESS** remote control. The wireless remote RF unit will use a microprocessor controller PLL synthesizer with up to 85 different channels and will operate in the frequency range of 902-928 MHz. The wireless remote will have a range of 300' with an obstructed view and 1,000' with an unobstructed view. The wireless remote will have an operating time of 130 hours of continuous use and will have a temperature range of -20 degrees to 160 degrees F. The remote control will come supplied with a lanyard to allow the operator to wear remote around his neck and have free use of both hands. The pendant control will include controls for the hose reel pay out and retrieve, throttle up/down, water on/off, and kill switch.	X		
M. REAR COMPARTMENT, TOOLBOXES, AND SKIRTING:				
1.	***Optional -** Rear compartment will be constructed of steel to protect all components located at the rear of the tank. The Rear compartment shall be designed for total enclosure of major components including the water pump, hydrostatic motor, hose reel and associated plumbing and sewer hose.	X		this is standard option
1a.	Rear compartment will be constructed of **aluminum** for corrosion resistance and to protect all components located at the rear of the tank. Rear compartment shall be designed for total enclosure of major components including the water pump, hydrostatic motor, hose reel and associated plumbing and sewer hose.	X		see options quote #14773
2.	Rear compartment must be of a one-piece construction including sides and top to allow for easy removal and eliminate any corrosion as the result of bolt together joints and seams.	X		
3.	Floor decking of rear body will be constructed of 11-gauge steel. Said flooring shall also be treated with a non-skid coating for maximum protection from slipping.	X		
4.	Rear compartment shall utilize three (3) "upward acting" compartment doors which incorporate a header/counter balance design. Made of anodized aluminum panels, which maximize maneuverability, minimize vehicle width and eliminate the safety hazard of open-hinged doors. Panels will have no rollers or cables, will resist rust and will be virtually maintenance free. Doors will include stainless steel, lockable and keyed alike heavy duty handles. The latch system to be a full width one piece lift bar operable by one hand. Each slat must have overlapping end clips to prevent slat from moving side to side. Top and side seals will prevent dust, dirt and moisture from entry compartment. Door shall have a 3" or less diameter counterbalance operator drum to assist in lifting the door. Hinged doors that protrude into work area, invite accident or personal injury, and could result in severe structural damage if vehicle is moved with hinged doors open, cannot be accepted.	X		
5.	The rear compartment will utilize two deluxe roll-up doors on either side. These doors will measure 48” wide x 52” high. These doors allow for complete access to rear compartment.	X		
6.	The rear compartment will utilize a deluxe roll-up door on the rear of unit that will measure 91” wide x 70” high. This door will protect components when closed and allow telescoping extension of hose reel when opened.	X		
7.	The rear roll-up door will be equipped with an automatic safety switch, which will not allow hydraulic extension of hose reel unless roll-up door is opened completely.	X		
8.	Stop, running, and directional lights will comply with ICC regulations.	X		
9.	The unit will have a heavy-duty rear bumper with hitch.	X		
10.	The unit will have mud flaps.	X		
11a.	***Optional -** Unit will include steel skirting with five (5) **steel** underbody toolboxes; two (2) toolboxes 18" x 18" x 30", two (2) toolboxes 18” x 18” x 36”, and one (1) toolbox 10” x 19” x 54”. The toolbox will be protected from the effects of water and road dust by a thick, automotive "bulb type" neoprene door seal. A heavy duty handle (locking style) will be provided on toolboxes.	X		see options quote #14773
11b.	Unit will include steel skirting with five (5) **aluminum** underbody toolboxes; two (2) toolboxes 18” x 18” x 30”, two toolboxes 18” x 18” x 36”, and one toolbox 10” x 19” x 54”. The toolbox will be protected from the effects of water and road dust by a thick, automotive "bulb type" neoprene door seal. A heavy duty handle (locking style) will be provided on toolboxes.	X		
11c.	Unit will include skirting that will be made of 11-gauge steel extending full height of toolboxes with cutouts for rear wheels.	X		
12.	Located in an underbody toolbox is an open hydro-root cutter oil storage reservoir mounted in a rollout assembly. The tank will be equipped with a hydraulic hand pump, which will be utilized to service the hydraulic root cutter. The tank will include a hinged lid which when closed will provide an airtight closure for the compartment. The tank will include a drain for draining of water and changing of hydraulic oil. An expanded metal basket will be included inside tank.	X		
12a.	***Optional -** Located in an underbody toolbox is an open hydro-root cutter oil storage reservoir mounted in a rollout assembly. The tank will be equipped with an **electric** pump, which will be utilized to service the hydraulic root cutter. The tank will include a hinged lid which when closed will provide an airtight closure for the compartment. The tank will include a drain for draining of water and changing of hydraulic oil. An expanded metal basket will be included inside tank.		X	Electric pump option no longer available
13.	Two (2) 4” PVC storage tubes for long handled tool storage shall be provided.	X		
N. ALL-WEATHER SAFETY SYSTEM:				
1.	The rear compartment shall be totally enclosed and heated with an 80,000 BTU heater. The heating of the compartment will prevent accidents and mechanical damage caused by ice build-up in hose (which can lead to hose bursts) and freezing of the high-pressure piping and/or water pump and will enhance overall ease of operations.	X		
2.	When not in the extended position, the hose reels shall be able to be retracted and housed within the heated rear compartment.	X		
3.	A recirculation fitting will be installed at the operators station to allow for recirculation of water. Recirculation will be possible at all times, including instances when truck is in motion.	X		
4.	An air purge system will be installed which allows high-pressure air to force water from system.	X		

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O. CONTROL PANEL:				
1.	The jetter control panel will be located at rear of truck on the curbside of the hose reel. All controls shall be mounted in a weather tight NEMA 4 control panel.	X		
2.	This control panel will include:	X		
	•Throttle •Low hydraulic oil warning light •Variable reel speed control •Control panel light •Water level indicator •Tachometer/hour meter			
3.	The dash controls shall include:	X		
	•Hydraulic lever instead of small joy stick for hose reel in and out •Water pressure gauge (glycerin filled) •Pump power control			
3a.	The dash shall include the hydraulic pressure gauge.	X		
3b.	The dash shall include the manifold reel control.	X		
4.	The jetter shall include a Rear Gauge Cluster (chassis engine monitoring) system. The system will consist of a single screen LCD monitor that will display engine Oil Pressure, Volts, Temperature, and RPM's. In addition it shall also be capable of monitoring various engine fault codes and service reminders. This option requires chassis to be provided with an SAE J1939 Interface (multiplex system).	X		
5.	PTO activation must be at the Operator Control Panel.	X		
P. LIGHTING:				
1.	Strobe light. LED 6" ON REAR,6" AMBER ON FRONT BUMPER, 180 LED ON cab , 180 6" AMBER EACH SIDE OF BOX. Amber led learning light system with side light & take down complete light bar	X		Also installing wig-wag lights on front/rear bumpers & side frame rails
2.	On top of rear compartment (*LED light on top of truck with multiple settings*)		X	see above unit will also have programable arrow board
3.	Floodlight at operator's station. LED	X		
4.	Handheld 12v/110v Rechargeable LED Spotlight	X		
5.	Arrow board, rear mounted LED	X		
6.	Arrow stick.		X	Arrow board will be used
7.	Rear pump compartment light LED	X		
8.	Lighting control panel shall be a a multi switch panel utilizing lighted rocker style switches (6)	X		
9.	LED work lights on each side of the truck Downward facing. Lights shall be flush mount to prevent damage from low hanging limbs and brush.	X		
10.	LED stop-turn-tail, marker and backup lighting. Led side work lights mounted high on each side of the work box not no to extend more then 2'' to prevent damage From trees and shrubs	X		
Q. MOUNTING:				
1.	Unit will be mounted using a base frame consisting of 3''x10'' tubing. Light panel shall be located in the cab of the truck and have internal switches for side work lights, warning light rear strobe (red) , Front Amber	X		
2.	Deck assembly will be bolted solid at rear and spring mounted under the tank to allow the jetter deck to fully support the tanks while allowing the truck chassis rails to flex.	X		
R. PAINTING:				
1.	Before painting, all metal shall be cleaned and etched with a phosphoric material to insure permanent bond of primer and paint.	X		
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.	X		
3.	The unit shall have the frame painted black and the hose reel and shroud assemblies to be painted standard white.	X		
S. ACCESSORIES:				
1.	25’ fill hose	X		
2.	Leader Hose	X		
3.	BB Hose Guide	X		
4.	Finned nozzle extension	X		
5.	Penetrator Nozzle with replaceable inserts	X		
6.	General Purpose Nozzle with replaceable inserts	X		
7.	Nozzle rack	X		
8.	Upstream pulley guide	X		
9.	Wash down gun with 25’ x ½” hose with quick disconnect	X		
10.	Paper Operator’s and parts manuals (3- copies each) CD-ROM Operators manual (copies each) On sight training by factory Trained Technician.	X		
11.	Vapor Rooter Chemical feed system or approved or equivalent to be installed in the heated compartment. System shall allow the applicator to foam root control utilizing the main 1'' hose system.	X		
Sa. OPTIONAL ACCESSORIES:				
1.	An additional paper Operator's Manual (3 copies Each)	X		see options quote #14773
2.	Smart Cutter root cutter kit with roller skids and blades for 8”, 10, 12, and 15” pipes.	X		see options quote #14773

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SELF-PROPELLED EASEMENT MACHINE
EXPANDABLE TRACK-DRIVEN

GENERAL - *It is the intent of these specifications to describe the minimum requirements for a self-propelled, all terrain type, mounted hose reel assembly to be used in conjunction a High Pressure Hydraulic Sewer Cleaner. The expressed purpose of this unit is to extend the capabilities of a high pressure hydraulic sewer cleaner into normally inaccessible areas such as but not limited easement, hillsides, ravines, creek beds, wooded areas and behind homes and buildings. The unit including all necessary equipment shall be furnished complete and ready for use. All equipment, not specifically mentioned, which are required for a complete unit shall conform in design, strength, quality of material and workmanship to the highest standard of engineering practice.*

A. DIMENSIONS: ***Because this unit is intended for use in undeveloped areas such as easements, wooded areas, and behind homes which requires passing through chain link fences, it is required that the following dimensions are met:***				
1.	Maximum Overall Length: 86” with reel assembly.	X		
2.	Maximum Overall Height: 63” with reel assembly.	X		
3.	Maximum Width with Tracks Retracted: 34”.	X		
4.	Width with Tracks Extended: 46”.	X		
B. MODE OF TRAVEL / DRIVE TRAIN:				
1.	Self-propelled, hydraulic drive system with skid steering propelled by dedicated 9” (nine inch) wide rubber crawler tracks.	X		
2.	Tracks shall extend hydraulically via a control valve. Manually extending track systems will not be accepted.	X		
3.	Dual hydraulic motors supply power to the tracks. Motors have full system pressure capable shaft seals to eliminate external leakage problems associated with similar products.	X		
4.	Steering is controlled by two sectional type directional control valve, which utilizes direct acting hydraulic valves. No cable controls shall be accepted.	X		
5.	Unit will be capable of 360-degree turning.	X		
6.	Unit will be capable of variable speeds.	X		
7.	Undercarriage shall utilize completely independent suspension. System shall consist of a drive sprocket on one end, an idler sprocket on the opposite end and three support idler wheels per side equally spaced along the length of the track between the drive and idler sprockets.	X		
8.	Ground pressure shall not exceed 5 psi.	X		
C. FRAME CONSTRUCTION:				
1.	The frame shall be constructed of formed steel plate, round and square tubular steel and built to accept full rated load in all ground conditions.	X		
2.	Frame must be capable of supporting an approximate operating weight of 2800 pounds consisting of 1800 pound transporter and 1000 pound payload.	X		
D. ENGINE:				
1.	The engine shall be air-cooled, gasoline, two cylinder rated at 24 HP at 3,600 RPM.	X		
2.	12-volt ignition system with charging system.	X		
3.	Starter with key locking switch.	X		
4.	Spin on replacement type oil filter.	X		
5.	Engine shall be supplied with a 18.5 liter/5 gallon fuel tank.	X		
E. OPERATING CONTROLS:				
1.	All indicators, switches, lights, and levers (except the reel control lever and water pressure gauge shall be located on the control panel in front of the operator. Controls to include:	X		
	•Ignition Switch •Throttle •Choke •Steering Controls			
2.	Unit will be supplied with a ball valve located at operating end of machine, which will enable the operator to bypass the water going to hose reel and cut off power to nozzle.	X		
3.	Unit will be supplied with a Pressure Relief valve rated for 3000 PSI. The relief valve discharge will be directed down to the ground to assure minimal impact to the operator's safety.	X		
F. HYDRAULIC SYSTEM:				
1.	Hydraulic reservoir shall have a capacity of 10 gallons.	X		
2.	An oil cooler shall be provided to facilitate adequate heat dissipation.	X		
3.	An auxiliary oil circuit shall be provided to support the use of hydraulic powered tools.	X		
4.	Said auxiliary oil circuit shall have a capacity of 10 gpm.	X		
5.	Hydraulic hose shall have a minimum pressure rating of SAE 100R2 type.	X		
6.	All hydraulic fittings shall have pressure ratings to meet or exceed that of the hose.	X		
7.	The hydraulic pump shall be direct coupled to the engine and provide all the oil required for both transport as well as reel control and tool circuit. The use of pulleys and belts to drive the hydraulic pump will not be accepted.	X		
8.	Hydraulic filter and assembly shall be located on the return line to the tank.	X		
G. SAFETY HOSE REEL AND FRAME:				
1.	Hose reel will be designed to withstand maximum working pressure and prevent hose damage.	X		
2.	Capacity of hose reel shall be 500’ of 1” high-pressure hose.	X		600' capcacity hose reel
3.	Reel shall be designed with a 1/4” steel flange.	X		
4.	Hose shall connect to reel within the reel.	X		
5.	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.	X		

*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.*		YES	NO	COMMENTS
6.	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.	X		
7.	Reel will be powered by #60 chain driven by a hydraulic motor. It will be controlled by a directional control valve with separate variable speed control.	X		
8.	The hose reel shall have the ability to rotate 180 degrees when the unit itself is in a stationary position. This allows for ease of access to manholes in difficult locations	X		
9.	The four (4) roller head will open to allow use of hose guide, fin extension, and nozzle without need to thread hose into guide.	X		
10.	The unit will be supplied with a Footage Meter mounted on the Hose Reel.	X		
11.	***Optional -** Hose reel will be equipped with an Automatic Level Wind, which allows for "hands-free" winding of sewer hose onto the hose reel without operator touching sewer hose. The automatic level wind system will incorporate a drive system, which scrolls a pivoting four roller head back and forth across hose reel for proper winding of the sewer hose onto the reel. The automatic level wind system is equipped with a hydraulic controlled elevation system which incorporates dual cylinders and pivot arms to raise and lower the level wind guide depending on location of manhole. Level Wind raises/lowers minimum 45 degrees. (This features limits the capacity of the reel to 500' of sewer hose.)	X		see options quote #14775
H. HOSE:				
1.	Hose will be 1” ID with an operating pressure of 2500 PSI and a minimum burst pressure of 7500 PSI.	X		1" x 600' will be supplied
2.	The unit will be supplied with an abrasion resistant plastic **(Armor Belt)** sewer cleaner hose capable of cleaning sanitary service lines, storm lines, culverts, drainage tiles and other open conducts. The hose outer cover will contain an integral belting of high tensile polymer reinforcement for cut and abrasion resistance.		X	no longer available
I. OPTIONAL ACCESSORIES:				
3.	Unit to be supplied with an *additional* paper operator's manual.	X		
4.	Unit to be supplied with a CD-ROM operator's manual.	X		
5.	3- Nozzles matched	X		
J. PAINT				
1.	Before painting, all metal shall be cleaned and etched with a phosphoric material to insure permanent bond of primer and paint.	X		
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.	X		
3.	The unit shall have the frame painted black and the hose reel to be painted standard white.	X		
K. OPTIONAL LIGHTING				
1.	LED Flashing Lights	X		
2.	Floodlight LED	X		
3.	Handheld 12v/110v Rechargeable LED Spotlight	X		
L. TRAILER FOR SELF-PROPELLED EASEMENT MACHINE - ***It is the intent of these specifications to describe the minimum requirements for a trailer unit designed to carry the self-propelled easement machine.***				
1.	Trailer will have a single 7,500 lb. axle assembly.	X		
2.	Trailer will be single axle unit utilizing ST205-15 C rated tires. Tires to be mounted on white spoke rims.	X		
3.	The trailer frame will have a channel steel A-frame tongue and 12 gauge steel front and sides that are 15" tall. The trailer assembly will incorporate the design of a heavy-ramp assembly to facilitate easy loading and unloading of the easement machine from the trailer.	X		
4.	The bed of the trailer shall measure 10'4'' long by 6'8'' wide.	X		
5.	The trailer will have a heavy pre treated wooden floor maximizing support for storage and transportation of the easement unit. Heavy duty eyebolts shall be located in the corners of the trailer to provide anchor points for unit tie-down.	X		
6	Trailer will be equipped with a 2-5/16" ball hitch mounted in a channel that allows height adjustment.	X		
7.	The trailer shall be painted back and all lights and reflectors will be installed on the unit in compliance with ICC, DOT and State regulations.	X		
8.	Trailer will be complete with electric brakes and break-away assembly mounted on the towing end of the trailer.	X		
9.	The trailer will be equipped with a tongue-mounted toolbox for storage of tools and accessories.	X		
10.	***Optional -** Trailer to be equipped with hydraulic surge brakes.	X		see options quote #14775
11.	***Optional -** Trailer to be equipped with pintle ring style hitch.	X		see options quote #14775