

Specifications for One Super Products, Camel® Combination Catch Basin/Sewer and High Pressure Cleaner

The following specifications are not to be considered as restrictive, however the specifications are based on desired performance levels with features deemed necessary to accomplish specific functions. The bidder shall indicate compliance to each section of the specifications by a **yes** or **no**. Any **no** indication must be fully explained in the deviations, exceptions, exclusions, space or it will be assumed that the features and performance are as specified without exception. If additional space is needed, bidder shall attach (on bidder's letterhead) a statement of deviations, exceptions, exclusions in the bid documents. Failure to deliver unit as proposed will result in rejection of the unit and/or nonpayment.

General

The equipment described herein shall be utilized for the purpose of simultaneous high pressure flushing of sewer pipes and removal of liquids and solids from the manhole. All operations shall be able to be performed by one operator. All material from the manhole shall be deposited within one cylindrical debris tank. Unloading of debris tank shall be accomplished via an internal ejector plate. The entire unit is to be of a single engine design. The chassis engine is to power all functions of the combination unit. Units utilizing additional engines are unacceptable due to weight, fuel costs, emissions, and maintenance costs. To avoid untried and untested units, the model bid must have been in production for a minimum of five years. A user list of the exact model bid may be required prior to awarding this bid.

WATER STORAGE TANKS

- 1500 gallon minimum usable capacity.
- Water storage saddle tanks mounted no lower than debris body.
- Rotational molded non-cross linked polyethylene construction with ultraviolet stabilizer and minimum ¼" thick wall. Must be repairable type polyethylene or stainless steel.
- Bottom of tank protected by ¼" steel to eliminate potential puncture from road debris.
- Total tank capacity divided among five separate tanks and interconnected together. Individual tanks shall all be mounted at the same level to prevent pressurization and breather problems.
- Tank suction shut-off valve with cast iron, "Y" type strainer to protect water pump.
- Easily accessible inspection ports provided on top of each tank.
- Lifetime "no rust-through or corrosion warranty" provided.
- The water fill system shall be located curbside, mid ship of unit with 25' x 2 ½" fill hose.
- Dual fill system will include a curbside fill location with top crossover piping to fill fresh water tanks on right and left sides from one location.
- Water tank fill system shall be capable of filling 1500 gallons of water in 10 minutes or less.
- Minimum 4" air gap on fill tube to prevent siphoning of water from storage tanks back into hydrant.
- Fire hydrant wrench shall be supplied.

Water Storage Tanks - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

SEWER FLUSHING PUMP

- Triplex positive displacement reciprocating plunger pump with built-in gear reduction.
- Continuous rating of 80 GPM at 2,000 PSI (Intermittent rating not acceptable).
- 10-Bolt Hot Shift PTO powered from truck engine.
- Pressure regulator 1", set at 2100 PSI with water return to water tank. Regulator shall be rebuildable.
- Pump will provide continuous water flow and pressure. Double acting single piston designs must be supplied with an Accumulator to remove pressure drop and offer a continuous flow and pressure.
- Piston and/or packing must not require greasing.
- Electric toggle switch at control panel shall control engagement and disengagement of water pump.
- Pump driven from PTO by a minimum, Spicer 1410 driveline, direct to pump shaft.
- Pump mounted below frame forward of debris tank to avoid road damage and potential contamination.
- Single 2-way ball valve for sewer nozzle operation.
- Multi flow system with dial at control panel to allow full vacuum with infinite control of water flow and pressure
- Pump shall remain flooded at all times water is in the tank to eliminate pump cavitation.
- Odometer will not operate when pump is operating to eliminate premature truck warranty expiration.
- Pump to operate with truck transmission in neutral when equipped with Allison 3000 series transmission

Sewer Flushing Pump – Comply Yes _____ No _____

Deviations, exceptions, exclusions:

WASTE WATER RECYCLING SYSTEM

- The unit shall be supplied with an automatic wastewater recycling system.
- At the selection of the operator, recovered water shall flow through a series of filters to a hydraulically driven centrifugal pump. Pump shall transfer water through two maintenance free centrifugal separators, which shall discharge solids back into the collector body. Filtered water shall pass into the fresh water storage tanks at a rate of 70 GPM minimum where it can be reused for high pressure sewer cleaning.
- Filters shall be cleaned by pneumatic back-flushing.
- Recycling system shall be fully automatic and when selected by the operator shall be functional when-ever a sufficient water supply exists in the body.
- Pump shall automatically shut off to prevent dry operation.
- Automatic controls shall maintain preset high and low levels of water in storage water tanks to prevent overfilling and to automatically maintain significant water level for continuous sewer cleaning operation.
- Recycling shall occur simultaneously with or independently of both the vacuum system and the high pressure water system.
- There shall be settling chambers located in the bottom of the fresh water tanks with a minimum of a 4" standpipe.
- There shall be 4" drains located at the rear directly at the bottom of each tank for complete flushing and cleaning of fresh water tanks.

Waste water recycling system – Comply Yes _____ No _____

Deviations, exceptions, exclusions:

VACUUM SYSTEM POSITIVE DISPLACEMENT

- Vacuum Pump Rotary lobe positive displacement "roots type" using two figure-eight impellers rotating in opposite directions to move entrapped air around the case to the outlet port. Pump shall be rated for continuous duty at 18" Hg. minimum.
- Casing shall be one piece, with separate head plates, and shall be made of ASTM A48 Class 30B close-grained cast iron. Each head plate shall be vented to atmosphere to prevent oil carry over into the air stream.
- Impeller & Shafts shall be integrally cast and machined from high strength ASTM A395-60-45-15 ductile iron. Thus the minimal tensile strength is 60000 PSI. Impellers shall be of the straight involute type and shall operate without rubbing, seals or lubrication. Tri-lobe impellers are not acceptable. The assembly shall be dynamically balanced by removing metal from the impeller body. Each shaft shall be fitted with a cast iron ASTM A48 Class 30B sleeve and ductile iron piston ring, SAEJ929. The piston ring is located on the shaft at the point where the shaft passes through the head plate to minimize air leakage into the system.
- Spur timing gears shall be manufactured to a minimum of AGMA 12 from SAE 8620 alloy steel, carburized and ground. The gears shall be hardened to 58-62 Rockwell "C" and splash lubricated. The gears shall be mounted on the shafts with a tapered fit and secured by a locknut to maximize serviceability. Alternate methods of gear to shaft attachment are not acceptable. Helical gears shall not be provided due to thrust loading.
- Each impeller and shaft assembly shall be supported by cylindrical roller bearings engineered for long service life and fixed to control the axial location of the impeller/shaft in the unit. Roller bearings shall be provided on both the drive and gear end of the unit. All bearings shall be of the same part number, make and model to maximize serviceability. Ball bearings are not acceptable.
- Each bearing housing shall include a positive lip type Viton™ oil seal designed to prevent lubricants from entering the air stream. Non-contacting seals shall not be provided due to the possibility of oil misting. A

Viton™ lip seal shall be installed on the drive end of the drive shaft. The bearings and timing gears shall be splash lubricated with a proven and reliable design. Grease lubrication is not acceptable.

- Fasteners: All fasteners shall be SAE J429-Grade 5, ASTM A449-Type 1, material as a minimum.

VACUUM SYSTEM POSITIVE DISPLACEMENT (Continued)

- The manufacturer shall perform a 1 PSI slip test on each Vacuum Pump. Certification shall be provided upon request.
- Vacuum Pump shall be capable of airflows from 0-3600 CFM and capability of developing 0" to 18" Hg.
- Unit equipped with a high efficiency exhaust silencer.
- 10-Bolt Hot Shift PTO powered from truck engine.
- Controls supplied on control panel to engage and disengage vacuum pump for operator safety.
- Pump driven from PTO by a matched set of cog belts with minimum total belt width of 4.33" (110 mm). V-belts are unacceptable due to potential fire hazard and high maintenance.
- Lower jackshaft grease fittings shall be located at ground level on grease manifold for ease of maintenance.
- To prevent an overload condition during normal and to eliminate "free wheeling" of the vacuum system, air shall enter the vacuum source automatically from outside the system through two mechanical vacuum relief valves whenever maximum vacuum is exceeded.
- To eliminate moisture in the housing and possible freezing, airflow must be vertical through vacuum pump.
- Dropout chamber mounted on pump inlet with sump check valve to automatically drain moisture and condensation. Chamber provides additional protection to pump against contamination.
- All vacuum pump drive gears shall be running in oil at all times. Drive gears relying on splash lubrication unacceptable.
- Vacuum source shall not require daily greasing.
- One 12" internal stainless steel float ball supplied for automatic vacuum system shut off when unit is full. (Electric shut off systems not acceptable).
- An externally mounted, vertical tapered cyclone separator with clean out will be incorporated between the positive displacement vacuum pump and the debris tank. Empty fan housings and horizontally mounted separators are not acceptable.
- Vacuum pump shall be protected by a cartridge filter capable of containing particles sized 10 micron or larger.
- Cartridge filter housing shall be constructed on ¼" steel 28" in diameter and 22" in deep.
- Filter housing shall have one single door hinged on the left for easy access. Door shall be secured by one single 12" "T" bolt.
- Filter element shall be 22" x 21" constructed of washable rigid polyester, unitized in a stainless steel housing, 98% efficient @ 10 microns. Filter element shall have qty of 130-2" pleats with a total filter area of 120 sq. ft.
- Odometer shall not operate when pump is operating to eliminate premature truck warranty expiration.
- Hydraulically operated internal boom flapper valve shall be supplied. By closing the internal boom flapper valve the operator will completely stop all air flow through the vacuum tube allowing the user to build an instantaneous vacuum within the debris tank.
- Odometer shall not operate when pump is operating to eliminate premature truck warranty expiration.
- Vacuum relief vent door, with switch located at operators station to automatically relieve vacuum. Switch will open a door via an air cylinder to stop the vacuum without disengaging the vacuum pump.
- Pump to operate with truck transmission in neutral when equipped with Allison 3000 series transmission.

Vacuum System Positive Displacement - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

DEBRIS TANK

- Minimum gross liquid capacity of 10.8 cu. yds.
- Cylindrical shaped for strength and corrosion resistance.
- Designed to withstand 367" of water vacuum.
- ¼" steel plate constructed. If Corten or Exten steel is supplied inside the debris body, it must be coated and carry a 10 year warranty against the coating scuffing peeling causing accelerated deterioration.
- Unloading of body is accomplished without going behind unit when body is full.
- Hydraulic powered open, full height and width flat rear door with self compensating neoprene seal located on door.
- Five mechanical, hydraulically operated tailgate latches shall be supplied for securing rear debris tank door. Hydraulic latching shall be accomplished by a single hydraulic cylinder with mechanical linkage. The design of the locking system will not allow the tailgate to open if hydraulic power is lost. Systems requiring separate manual latches to secure the door in the event of hydraulic system failure are unacceptable.
- Exterior mechanical liquid level gauge.
- Top of debris tank not to exceed 11 feet from ground level to ensure low center of gravity.
- Internal tank flushing system with 1" dia. Schedule 80 high pressure pipe with 13 jets working off triplex pump supplied. Flusher capable of 2000 PSI.
- All rear door grease fittings shall be located at ground level on grease manifold for ease of maintenance.

Debris Tank - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

COLLECTOR /DEBRIS BODY UNLOADING & COMPACTION DEWATERING SYSTEM

- Full diameter fabricated steel ejector plate with two-stage hydraulic cylinder.
- Controls for latching/unlatching, opening/closing and extending/retracting ejection plate must be located on the driver's side behind the cab and forward of the debris tank for operator protection.
- One internal surge baffle for debris tank.
- Adjustable elastomer wipers to clean bottom, sides and top of tank while unloading debris.
- Baffle shall keep debris away from front drain to maximize dewatering capabilities.
- The ejector system will be designed to allow the operator to compress material in the debris tank to remove the maximum amount of liquid possible.
- In the compaction cycle, the hydraulic system will be preset so as to limit the stroke of the cylinder.
- Controls to operate the compaction system will be integrated with the standard ejector plate control and be located on curb and street sides of the unit.
- A separate hydraulic gauge will be provided, curb and street sides to monitor the compaction cycle.

Collector/Debris Body unloading & Compaction Dewatering system –

Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

TANK DRAINS

- Six inch diameter tailgate drain with stand pipe, knife valve with locking handle and 10 feet of fabric drain hose supplied.
- A six inch diameter drain complete with knife valve with locking lever and 25 feet of fabric drain hose located forward of the ejector plate and positioned near the bottom of the debris tank for maximum liquid/debris separation.
- Drain hoses equipped with quick-lock clamps for fast removal of hose for back flushing drain.
- Body drain capable of pneumatic back flushing in order to unclog without opening tailgate.

Tank Drains - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

HOSE REEL, FRONT MOUNT “ROTATING”

- Hose Reel and Drive. The hose reel assembly shall be front mounted near the center of the unit with 180° manual rotation to facilitate manhole entry and reduce traffic flow interruption. Manual rotation shall occur between the headlights of the truck chassis keeping the reel at a centered position at all times.
- Hose reel assembly shall rotate on a large diameter ball bearing and include a pneumatically actuated lock, which will positively lock the reel in any position across its operating range.
- The hose reel minimum capacity of 800’ of 1” I.D. sewer hose. Drum and flanges constructed of ¼” (6mm) steel, designed to withstand maximum working pressure without distortion. The drum shall have a minimum of 20” diameter to prevent hose damage. The reel shall be supported by two (2) heavy duty self aligning pillow block bearings, bolted to a ¼”, (6mm) wall thickness 2” x 2” tubular frame.
- 600’ of 1” plastic sewer cleaner hose supplied with 2500 PSI working, 6250 PSI burst. Hose & fittings must be constructed per standards established by NSWMA.
- Direction and speed hydraulically controlled from operator’s station.
- Reel driven by a double chain, hydraulic drive producing a minimum 10,000 in/lbs. torque and a variable speed from 0 to 50 RPM utilizing an open center directional control valve w/adjustable priority flow divider and adjustable relief. The reel drive motor shall have a minimum displacement of 14 cu.in. with a 1-¼” shaft creating a torque equivalent to 3600” lbs. at 2000 PSI. The hydraulic system for powering the reel shall consist of a hydraulic pump with a capacity of at least 10 GPM at 2000 PSI. The system shall also include a hydraulic reservoir with a minimum capacity of 15 gallons complete with spin-on filter and combination oil level and temperature gauge.

Hose Reel, Front Mount “Rotating” - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

AIR PURGE SYSTEM

- Self-contained system for purging water from jetting hose, handgun lines and pump to prevent freeze-up supplied. Air supplied by truck air compressor with appropriate safety check valves for brakes.

Air Purge System - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

WINTER RECIRCULATION SYSTEM

- A system will be supplied to prevent freeze-up by pumping water through system, including hose reel while driving to jobsite.
- Winter recirculation system will enable travel over the road without damaging pump, drive systems or truck transmission. Systems where hydraulic pump is direct coupled to truck transmission are not acceptable.

Winter Recirculation System - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

WATER WASHDOWN & HYDRO EXCAVATION SYSTEMS

- Triplex pump will supply water source with means of regulating pressure from 0 to 2000 PSI available at handgun.
- Quick disconnects located at front operator station and driver's side mid-ship of unit. (None shall be located at rear to eliminate corrosion of connection from collected materials.)
- Retractable hose reel with live center complete with 50' x 1/2" hose provided with quick disconnect
- Hydro excavation hand gun system including water lance with two 6' x 3/4" pipe extensions and one (1) urethane covered 3-orifice nozzle.

Water Washdown & Hydro System - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

POWER BOOM

- The power boom shall have a minimum of 210 degree hydraulic rotation and be lockable in any position.
- A boom rest for transport shall be directly mounted to sub frame.
- Boom shall not raise with debris body.
- The boom vertical lift shall be a minimum of 16'.
- The lift capacity at the boom end with boom fully extended shall be 1,000 pounds minimum.
- A joy stick shall be permanently mounted to the operator control station for all boom functions.
- The boom shall be remote controlled from a removable pendant station. A nine pole eight function boom pendant shall be supplied with: up, down, in, out, right, left.
- In addition to wired pendant a wireless remote control shall be supplied to operate all boom functions along with vacuum vent door relief, flapper valve and engine throttle.
- The boom shall be 8" and reach a minimum of 268" from centerline of unit. Hydraulic boom extension of 8' shall be true telescoping tube inside of tube design which will extend and retract without affecting the steel elbow or lower the suction tube position.
- Extra long radius boom elbow with 6" x 1/4" steel channel reinforcement. Boom elbow to carry a full three year replacement warranty.
- The travel storage position shall be at front right corner of truck bumper for driver visibility.
- All boom grease fittings shall be located at ground level on grease manifold for ease of maintenance.

Power Boom - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

TOOLBOXES

- Two (2) lockable aluminum toolboxes, 18"x18"x48"

Toolbox - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

CONTROL CENTER

- Reel and boom control panel located in front of vehicle for operator ease.
- Vacuum and water pump engagement controls located on the control panel.
- Hose reel direction and speed control located at operator's station in front of vehicle.
- Digital readout, programmable sewer hose reel counter.
- Water pressure gauge located at operator's station.
- Electric throttle control for truck chassis engine located at operator's station in front of vehicle.
- Receptacle for boom control pendant located at operator's station in front of vehicle.
- Receptacle for hand light located at operators station.
- Tachometer located at control station.
- Engine kill switch located at control station.
- Two quick disconnections for handgun supplied (one at operator's station and one at dump control station mid ship of unit driver's side).

Control Center - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

VACUUM TUBES AND BRACKETS

- 8" O.D. aluminum tubes with male/female fittings supplied for ease of assembly.
- One 7 foot section, two 5 foot sections, one 3 foot section, one 2 foot fluidizing tube and six 8 foot vacuum tube sections supplied for a total of 58 feet on aluminum tubing. One gasket and over center clamp for each tube supplied. No tools required with clamps.
- Hydraulic fold down, six tube storage rack located on rear door.
- Three tube vertical tube storage rack located curb side behind chassis cab.

Vacuum Tubes and Brackets - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

ELECTRICAL

- Sewer cleaner body must include a “CAN buss” style self diagnosing, via built in LED indicators, electrical system.
- System must have the capability to auto-log error codes for diagnosing issues without taking unit out of service and returning sewer cleaner to dealer for diagnoses.
- Electrical system must use no more than a single twisted pair, throttle wire, and power wire between the front control unit and the main sewer cleaning body.
- The system shall be sealed to Rugged Condition, ANSI EP455 standards, including epoxy encapsulation to enhance performance in response to vibration, moisture, temperature, and chemicals

Electrical - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

NOZZLES

- One 1" Chisel nozzle with 4- 12° forward jets, 6- 30° rear jets, stainless steel inserts and carry a full three year warranty.
- One 1" Grenade nozzle with 4- 15° & 4- 25° rear jets, stainless steel inserts and carry a full three year warranty.
- One 1" Rotor nozzles with 4- 18° rotation jets and carry a full three year warranty.
- One 1" Small flying nozzles with 8- 7° rear jets and carry a full three year warranty.
- One 1" Jr. Ultimate Chisel nozzle with 6-12° & 6-30° rear jets and carry a full three year warranty.
- One 1" Pipe Wolf, turbine driven root, silt and grease cutter capable of reaching 6000 rpm and not require any type of lubrication.
- Nozzles to be constructed of hardened stainless steel, with the interior water chamber machined with optimized 3D hydro mechanics
- One 1" nozzle extension supplied.

Nozzles - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

ACCESSORIES

- 2½" x 25' fill hose with fittings for filling water tanks.
- Minimum 5000 psi rated handgun with 50' of ½" hose shall be supplied with spring retractable reel.
- One “tiger tail” hose guide, complete with rope.
- Two LED Strobe lights, one located top front of unit and one rear.
- One each operation, maintenance and parts manual.
- Aluminum fenders over rear tandem axles.

- Manhole puller hook.
- 1" x 10' Leader hose.
- Rear mounted LED arrow board shall be supplied with controls in cab.

ACCESSORIES (Continued)

- Hand light with 15' cord supplied with receptacle located at operators station.
- Highway warning triangles (3) with storage box mounted inside chassis cab.
- 2 ½ lb. BC dry chemical fire extinguisher mounted inside chassis cab.
- 112 dba back-up alarm, located at rear of unit.
- Water and vacuum pump hour meters.
- Safety cone rack complete with six 28" orange cones.

Accessories - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

PAINT

- Enamel paint unit to match chassis cab.
- Chassis cab color Red.

Paint - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:

WARRANTY

- Warranty minimum one year on sewer/catch basin cleaner on defects in material and workmanship.
- Minimum ten years on debris tank.
- Minimum lifetime no rust-through or corrosion on water tanks.
- Minimum five years on positive displacement vacuum pump lobes.

Warranty - Comply: Yes _____ No _____

Deviations, exceptions, exclusions:
