

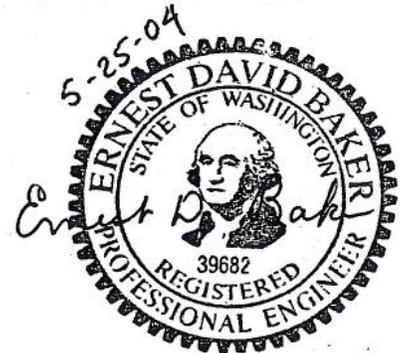
ATTACHMENT 1 A

**Specification for Sewer Cleaner Truck Bodies
With High Pressure Water Jets**

Project: 0464 and 0474
Replaces: SPU No. 5521 and 5724
Parks No. 5969

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EXPIRES 1/22/2006

ITEMS REQUIRED

RESPONSE

SCOPE:

1. This specification describes nine (9) cubic yard combination sewer cleaners with a five (5) cubic yard option. Specific performance requirements and design features are set forth in this specification. Each sewer cleaner body and associated systems and components are to be installed on a City of Seattle furnished cab chassis. The nine yard debris body unit will be a tilt cab over chassis rated at 54,000 lb GVWR, tandem-axle with an approximate 200 inch wheel base and having a 335 HP C-10 Caterpillar engine and an Allison 4500RDS transmission. The five yard debris body unit will be a conventional cab chassis rated at 52,000-lb GVWR, tandem axle with approximately 220 inch wheelbase and having a 300 HP C-7 Caterpillar engine and Allison 3000RDS transmission. State the CA and WB recommended for the nine yard and five yard machines.
2. The cleaner shall combine a high velocity water jet and an air conveying vacuum system for the purpose of removing debris (sludge, mud, sand, gravel, rocks, bottles, cans, grease, and roots) commonly found in sanitary sewer and storm drain systems (laterals, storm lines, culverts, mainlines, trunk lines, interceptors, catch-basins, digesters, wet wells, bar screens).
3. The cleaner shall be suitable for mounting on the truck chassis described above to maximize legal payload.

COMPLY

COMPLY

COMPLY

ITEMS REQUIRED**RESPONSE**

- | ITEMS REQUIRED | RESPONSE |
|---|-----------------|
| 4. The water and vacuum systems shall be capable of operating independently and simultaneously with independently variable outputs without degradation in the performance of either. | COMPLY |
| 5. The air conveying vacuum system shall provide for the simultaneous removal of debris flushed to the manhole by the high velocity water jet. | COMPLY |
| 6. The machine shall be capable of being operated by one person with all operating controls for the high velocity jet and air conveying vacuum system located at the front of the truck chassis. | COMPLY |
| 7. Machine layout and design shall provide for ease of operation, ease of maintenance, and maximum safety. | COMPLY |
| 8. The contractor shall mount the cleaner on the City-supplied chassis along with all required equipment so as to furnish to the city a complete combination sewer cleaner and jet rodder truck ready to operate. | COMPLY |

DEFINITIONS:

1. SAE means The Society of Automotive Engineers
2. RCW means the Revised Code of Washington
3. WAC means the Washington Administrative Code
4. EPA means the Environmental Protection Agency
5. CCA means cold cranking Amperes as determined by tests conducted in accordance with paragraph 3.7 of SAE J537
6. FOB means Free on Board as defined in RCW 62A.2-319(1)(b)

GENERAL REQUIREMENTS:

- | | |
|--|---------------------------|
| 1. Proposers are encouraged to offer options in their proposal. Cost differences, alternatives and product advantages should be detailed and completely defined in the proposal. | List of Options attached. |
| 2. All units shall be new, unused, up-to-date models and shall be delivered ready to be used. Each unit shall include all inspection coupons and warranty identification cards furnished to general trade. | COMPLY |
| 3. All components shall be rated at or above the maximum working load they would be subjected to in severe service. | COMPLY |
| 4. All components and accessories cataloged as standard, unless superseded by these specifications, shall be provided with the unit. | COMPLY |
| 5. In the event of a conflict between the specifications requirements and federal or state laws, the federal or state laws shall prevail. | COMPLY |
| 6. All controls and instrumentation shall be clearly identified and permanently labeled. | COMPLY |
| 7. The unit shall be designed so that inspection and service points, including grease fittings, shall be readily accessible. | COMPLY |

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8. If special tools, gauges, adapters, etc., are required for normal maintenance, adjustment or inspection of the unit, they shall be identified and provided with the unit.
9. Filters shall be easily accessible and replaceable without removing or disconnecting other components. Filters shall be mounted in such a way to minimize any spillage of fluid. If necessary filters will be remotely mounted to meet these requirements. Filters shall not hinder access to dip sticks, fill ports or sight gauges. Spin-on filters are required for fluid service unless specified otherwise. All filters shall be heavy-duty and sized for severe service.
10. Hoses, wires and tubes shall be securely and neatly positioned to avoid sharp edges, excessive wear and chaffing. Grommets, bulkhead fittings or other protective means must be used where applicable.

COMPLY

COMPLY

Spin-on filters where possible. Loop filter is canister style.

COMPLY

HYDRAULICS:

1. Parker™ hydraulic pumps are preferred. The pump(s) shall supply hydraulic fluid at the proper pressure and volume to operate the entire system. The system shall be designed with a flooded pump suction(s). Specify the pump(s) used in the hydraulic system, maximum volume and system pressure.
2. Variable displacement piston pumps shall be electronically controlled.
3. Describe in detail the pump drive system for each pump. Include the functions that each pump operates, hydraulic horsepower draw and sizing for the drive components.
4. As part of the City of Seattle's green fleet policy the Hydraulic fluid will be Chevron "Clarity" AW ISO 46 biodegradable oil. The system must be tested at full system pressure. No leakage is allowed. A reflective decal stating "Use Chevron Clarity Biodegradable Hydraulic Oil Only" will be installed on hydraulic tank viewable by anyone adding fluid to the reservoir. Type and size of tag to be Senior Engineer approved.
5. Dealer installed hydraulic hoses shall be "Parker Super Tough" cover- SAE rated for suction and pressure according to application or Senior Engineer approved equivalent. All lines shall be sized for full flow resulting in a maximum suction line velocity of 4 feet per second, a maximum pressure line velocity of 20 feet per second and a maximum return line velocity of 10 feet per second. Hoses shall be routed so as to avoid abrasion and sharp edges. Hoses will be clamped at intervals no greater than 24 inches. If wire ties are used, they will be black and not less than ¼ inch in width. Wire ties will be installed and cut with a properly sized Thomas and Betts style installation tool so that no sharp edges are exposed.
6. All hydraulic fittings and adapters on the pressure side of any circuit will be SAE o-ring, 37 degree flare, split flange or Senior Engineer approved alternate. The use of NPT or NPTF

Rexroth/Vickers

COMPLY

COMPLY

COMPLY

Dealer installed hoses, COMPLY

COMPLY

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threads on the pressure side is undesirable. Teflon tape anywhere in the system is unacceptable and will result in rejection.	
7. Hydraulic hose fittings shall be crimp type of the same manufacture as and designed to use with the hose.	COMPLY
8. The system shall be designed to avoid heat. The system should be designed to prevent the reservoir temperatures from exceeding 160 degrees Fahrenheit during normal operation on an 80 degree day. State the design features to maintain a cool system.	COMPLY
9. The system shall be tested at full system pressure with no leaks allowed.	COMPLY
10. The reservoir will be fabricated from steel using a minimum 1/4 inch overlapping seam construction. It shall be designed to prevent aeration and cavitation with all cylinders fully extended. The reservoir shall be mounted above the pump inlet to provide a flooded inlet. Describe the reservoir dimensions and mounting or include a drawing. Give details of how the above requirement is met.	COMPLY
11. The reservoir must include the following items:	Per attached drawing.
a. A minimum 24 square inch top clean-out cover. Side clean out covers are unacceptable.	COMPLY
b. A filler breather should be incorporated into the cover. The filler breather will have a filtered air vent and a basket screen. The filler shall be located as close to the center of the reservoir as possible and still be easily accessible.	COMPLY
c. Removable 100 mesh suction strainer.	COMPLY
d. Sight gauge with built in temperature indicator, clearly visible from the ground.	COMPLY
e. A nonrestrictive ball valve on the suction line between the suction strainer and the suction hose.	COMPLY
f. A magnetic drain plug at the bottom of the reservoir. A magnetic removable rod may be used in conjunction with a standard drain plug in the bottom of the tank.	COMPLY
g. The tank shall be equipped with a minimum of one center baffle. The baffle will allow oil to flow around the bottom corners and top. The suction and return ports will be on opposite sides of the baffle. Baffle welds are not to be ground.	COMPLY
h. The return line filter is to be a tank top, immersed style. The filtration rating shall be 10 micron nominal with a minimum flow rating of twice the pump output GPM. All return lines, including the filter outlet, are to have downcomers installed, if necessary, so that oil is discharged into the tank below the oil level when all the cylinders are in the extended position.	COMPLY - per Addendum 1
i. If a Parker hydraulic system is used the filter must be a Parker filter with a 10 micron absolute rating. The vendor is required to obtain the approval from Parker	Aeroquip/Vickers

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- for their 3 year system warranty. State if the system offered meets this criteria.
- j. Filter restriction indication shall be provided. The gauge provided shall be located to be easily readable. COMPLY
 - k. The reservoir shall be thoroughly cleaned to remove any weld slag or manufacturing debris. The reservoir is to be slosed with Randolph 912 Slosing Compound or Senior Engineer approved equivalent. COMPLY
 - l. The reservoir shall be hydrostatically pressure tested at 3 to 5 PSI with no leaks to be allowed. COMPLY
 - m. All mounting hardware is required to be grade 5 minimum either zinc plated steel or stainless steel with locking nuts. Split "lock" washers are not acceptable. COMPLY

ELECTRICAL AND LIGHTING:

Wiring:

- 1. Any dealer/vendor added electrical runs shall use the following mil-spec wire: "Alpha" part number 7046, MIL-W-16878D Type D or Automotive Engineer approved equivalent. MIL-W-16878D Type D is a multi-strand, tinned copper wire with a Polyolefin insulation rated at 125 degrees Celsius and 600 volts. All wiring circuits other than the Truck-Lite lighting systems described elsewhere in these specifications shall use this type of wire.
 - a. All wiring shall be color coded and/or numerically laser etched a minimum of every twelve (12) inches. COMPLY
 - b. Load circuit wires shall be AWG-14 or larger based upon load current and wire run length. SAE standards for wire size vs. run length are to be followed. COMPLY
 - c. Indicator lamp wires may be AWG-18. COMPLY
- 2. All wiring circuits using the MIL-W-16878D Type D wire shall utilize terminals conforming to MIL-T-7928, MS25036, Type II, Class 2 (insulated with an insulation grip).
 - a. Added runs shall use dual crimped (insulator crimp and conductor crimp), using the crimping tool designed for the specific wire. COMPLY
 - b. Ring terminals with proper diameter mounting screws shall be used on all MIL-Spec wires. Spade or hook terminals are unacceptable. COMPLY
 - c. Inexpensive, plastic type splices known as "Scotch Locks" or equal will be aggressively rejected and wires using them will be rejected and replaced at Vendor's expense. DO NOT USE THESE DEVICES. COMPLY
 - d. Full length wire runs only will be accepted. Connections will be made at junction box, lamp housing or appliance only. No in-line splices are acceptable. COMPLY
- 3. Wire or wire bundles shall be routed free of chafing and abrasions and shall be supported using industrial grade, non-Dealer installed electrical. COMPLY
Vac-Con standard wiring configuration; See attached
COMPLY
Vac-Con wiring Deutsch connectors. COMPLY
Liquid tight Deutsch connectors. COMPLY

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corrosive, insulated clamps. Clamp spacing will be approximately 12-inches.

COMPLY

a. Wires penetrating through bulkheads must use NYLOCK or equal bushing/grommets with ¼" radial clearing between wire/wire bundle and bushing.

b. All wiring harnesses shall be "Kellems" PVC jacketed loom, or Senior Engineer approved equivalent.

Expandable web protective sleeve.

COMPLY

4. Grounding for any lighting or other electrical device mounted on the debris body shall be provided by a ground wire or strap routed to the truck chassis

5. All wiring runs shall be continuous and shall connect through sealed junction boxes.

Liquid tight connectors.

COMPLY

6. All system control components and wiring shall be protected from weather and road hazards.

Lighting:

1. All lights and reflectors required by DOT, ICC, FMVSS 108 standards and Chapter 46.37 of the Revised Code of Washington shall be furnished. Truck-Lite or Senior Engineer approved equivalent, sealed lighting system installation is required.

Truck Lite
Reference Drawing #
#711-15115.

2. A "Truck-Lite" flasher, (part# 97201) shall be installed to achieve correct LED lighting flash speed. Hazard lights shall be operational with factory switch.

3. The following lighting, or Senior Mechanical Engineer approved equivalent, shall be installed:

a. Installation shall include Truck-Lite series 50 wiring harness with TruckLite 50400 junction box or boxes

b. Wiring connections will be made inside lamp housings or junction boxes only.

c. Rear Stop/Tail lights, quantity two (2), shall be red LED Truck-Lite, Diamond Shell, 4" Super 44 series.

d. The turn lights, quantity two (2), shall be amber LED Truck-Lite, Diamond Shell, 4" Super 44 series.

e. The backup lights, quantity two (2), shall be clear incandescent Truck-Lite, 4" 40 series.

f. All rear lights shall be flange mounted and protected against damage.

g. All clearance lights are to be Truck-Lite LED Model 21 Diamond shell and shall be hard flange mounted.

h. One (1) LED license plate light "Truck-Lite" LED model 15.

Truck Lite
Reference Drawing #
#711-16801 - (2) Pages

i. Front, rear, and side reflective striping required. Striping will be "3M" reflective truck marking, conforming to DOT requirements.

COMPLY

j. Whelen TA870L LED arrow stick or Senior Engineer approved equivalent mounted on the front of the body.

COMPLY

k. Whelen TA1664L LED arrow board or Senior Engineer approved equivalent mounted on the rear of the body.

COMPLY

l. TruckLite 10275R identification lamps

COMPLY

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- m. TruckLite 15226 LED license plate light. COMPLY
- n. Whelen Amber Responder R6DXP shall be mounted to the cab as far forward as possible at each top front corner (2 total). Lights mounted to the mirrors are unacceptable. COMPLY
- o. Install six (6) Federal Signal DOT series LED Cuda TriOptic lights (Amber in color) Model # MODLED1F with solid flange mount two (2) each at the rear top of the debris body, two (2) each at the bottom of or just below the debris body and two (2) mounted mid-ship, one (1) on each side, to be synchronized by a #650201 Intelli-Flash flasher module. LED lights to be activated by required WiredRite switch on WiredRite switch panel. All lights to be guarded with eyebrows where necessary. Exact location of lights and activation switch to be determined at pre-build meeting. COMPLY
- 4. Additional lighting and conspicuity materials shall be supplied as required by the Code of Federal Regulations 49CFR571.108, the Revised Code of Washington, and the Washington Administrative Code. COMPLY

Switches:

- 1. All switches for added accessories shall be Wired Rite system heavy duty rocker switch assemblies mounted on a Wired Rite panel with LED indicator lights and engraved illuminating legends denoting switch functions. COMPLY
Wired Rite system
 - a. Switches shall be internally protected from overload and shall self reset.
 - b. Switch amperage rating shall be determined by the load device being switched. SAE standards shall be followed.
 - c. All controls and switches shall be lighted upon activation, or when the chassis lights are on.
 - d. All controls and instrumentation shall be clearly identified and permanently labeled. Engraving height will be as large as possible given the space limitation of the switch panel.
 - e. A minimum of one (1) unused switch shall be installed in the panel for future use.
- 2. Continuous duty relay, Cole Hersee model 24143 (12 VDC) 200 amp, connected to ignition accessory is required to power "Wired-Rite" panel. COMPLY
- 3. All circuits shall be protected by auto reset circuit breakers, Potter and Brumfield W58XC4CXXA or Senior Engineer approved equivalent, appropriately rated for each circuit electrical amperage load. COMPLY
- 4. Switch panel location will be determined at time of installation with the Senior Engineer's approval. COMPLY
- 5. Engraving height will be as large as possible given the space limitation of the switch panel. COMPLY

ITEMS REQUIRED**RESPONSE****DEBRIS BODY:**

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| 1. The debris storage body shall have a minimum useable liquid capacity of 9 cubic yards. | COMPLY |
| 2. The body shall be round or oval for maximum strength. | COMPLY |
| 3. The debris body shall rise to a minimum 50 degree angle above the horizontal plane for dumping. | EXCEEDS 55 degree |
| 4. The debris body hoist mechanism shall be equipped with a mechanical prop for safety during maintenance. | COMPLY |
| 5. The debris body hydraulic lift circuit will include one or more hydraulic counterbalance valves, Sun Hydraulics CBCG-CKN-ECJ or Senior Mechanical Engineer approved equivalent, to enhance safety and to facilitate smooth power - down operation. | COMPLY,
Mechanical Hydraulic
Scissor Lift |
| 6. The hoist system shall be double-acting, (power-up and power-down). | COMPLY |
| 7. The vacuum hose and boom assembly shall not rise with the debris body. | COMPLY |
| 8. Dump controls will be located on the curb-side of the unit, well forward of the dumping area for safety. | COMPLY |
| 9. The debris body will be designed in such a manor to deflect the incoming air and debris stream away from the rear door. A deflector plate may be used to direct the debris stream. | COMPLY |
| 10. The debris body shall have an 8-year non pro-rated warranty covering any failure of the body. | COMPLY |
| 11. Describe and state the design advantages of the proposed debris body, door, locking mechanism, drain, overflow prevention system and flush out system. State the material and thickness used for the debris body and door. | COMPLY |

DEBRIS BODY REAR DOOR:

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| 1. The rear debris body door will have the same diameter and shape as the debris tank. | COMPLY |
| 2. The rear debris body door shall be full-opening and hinged at the top. | COMPLY |
| 3. A rubber or neoprene compound seal will be provided between the debris tank and the rear door to prevent leakage of liquids from the debris tank. | COMPLY |
| 4. The hinge point of the debris body rear door will be adjustable to allow for seal wear and proper alignment. | COMPLY |
| 5. Hydraulic debris body door open and close shall be provided. | COMPLY |

DEBRIS BODY REAR DOOR LOCKING MECHANISM:

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| 1. For safety, the rear door shall lock and un-lock hydraulically. | COMPLY |
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ITEMS REQUIRED

RESPONSE

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| 2. Each latch shall have an easy means of adjustment without welding or grinding shims. | COMPLY |
| 3. A manual locking system is desired to back up the hydraulic latches for added safety. | COMPLY |

DEBRIS BODY DRAIN:

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|---|--------|
| 1. The drain system shall be designed to separate excess water from the debris, for the driest possible load discharged at the dump site. | COMPLY |
| 2. The inside of the rear door shall include a baffle system to minimize the clogging of the drain with solids while allowing the maximum discharge of excess water regardless of debris consistency. | COMPLY |
| 3. The drain shall have a lever-controlled butterfly drain valve installed at the opening. | COMPLY |
| 4. The drain will have a hand gun quick disconnect coupler installed between the valve and the debris body. This will be used to break up any clogged debris at the valve entrance. | COMPLY |
| 5. The drain valve shall have 10 feet minimum of 6- inch minimum diameter lay-flat hose attached. | COMPLY |

DEBRIS BODY OVERFILL PREVENTION:

- | | |
|---|--------|
| 1. An automatic system which completely shuts down air flow preventing body overfilling and wastewater discharge into the atmosphere shall be supplied. | COMPLY |
| 2. An internal float device with external indicator shall be supplied to show when the debris body is loaded to capacity. | COMPLY |
| 3. A vacuum breaker system shall be supplied to stop the air flow in the suction hose, and it shall operate from the front hose reel control station without shutting down the vacuum drive system. | COMPLY |
| 4. The vacuum breaker control switch shall enable operator to pick up large debris with boom and place debris on road surface. | COMPLY |
| 5. The vacuum breaker control switch shall also be used for safety; in an emergency the suction must be capable of being shut off from the front operator's station. | COMPLY |

DEBRIS BODY FLUSH OUT:

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|---|--------|
| 1. A debris body flushout system shall be provided that is permanently plumbed and valved to the high pressure water jet system. The nozzles will be located a minimum of 18 inches off the bottom of the tank to prevent plugging them up with debris. | COMPLY |
|---|--------|

ITEMS REQUIRED

RESPONSE

CENTRIFUGAL COMPRESSOR:

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|---|--------|
| 1. The cleaner shall be equipped with a multi-stage, two or three stage, centrifugal vacuum compressor. State the design aspects of this blower that would be a benefit for the City of Seattle. | COMPLY |
| 2. State the performance of the compressor system at standard temperature and barometric pressure. Include the vacuum capabilities at maximum, minimum and midrange restriction. State the vacuum reading after one (1) minute and five (5) minutes with the end of the hose submerged. | COMPLY |
| 3. A system air pressure and flow data sheet, certifying the above performance will accompany the contractor's proposal. | COMPLY |
| 4. The centrifugal compressor shall have a 5-year non pro-rated replacement warranty on the rotor, impeller blades, and housings, covering any failure whatsoever, including, but not limited to, failure from abrasion. | COMPLY |
| 5. State the advantages of the proposed compressor and housing design. | COMPLY |
| 6. State the repair part replacement cost, rebuild cost and estimated lead time for the compressor blower wheel. | COMPLY |

CENTRIFUGAL COMPRESSOR DRIVE:

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|---|--------|
| 1. The centrifugal compressor and the high-pressure water jet system shall be driven independently from one another and shall be capable of being operated independently from each other. | COMPLY |
| 2. The operator must be able to disengage or stop the rotation of the compressor from the front hose reel operator's station as well as control the amount of vacuum. | COMPLY |
| 3. Give a detailed description of the compressor drive design used. Include drive efficiency data and the technical advantages of this design. | COMPLY |
| 4. State the replacement cost, rebuild costs and estimated lead time for the major components in the compressor drive system. | COMPLY |

AIR FLOW FILTRATION:

- | | |
|--|--------|
| 1. Primary air filtration inside the debris tank prior to the centrifugal compressor will consist of two steel filter screens. | COMPLY |
| 2. A cyclone separator shall be mounted prior to the compressor to remove particles from the air stream. State the design advantages of the separator offered. | COMPLY |

ITEMS REQUIRED

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VACUUM SYSTEM PICK UP HOSE AND BOOM:

1. The vacuum system pickup hose shall be front loading; with the end of the boom suction hose attached at the front hose reel operator's station during transport, and include the following features:
 - a. The 8 inch I.D. vacuum pickup system shall be supported on a boom which will provide a minimum of 11 feet vertical lift. State total vertical lift offered. COMPLY
 - b. Vacuum hose shall be 8 in. I.D. Kanaflex -type or equal upper and lower sections with a heavy duty fixed steel elbow for wear. State the elbow material and thickness used. EXCEEDS
2. The boom shall have a minimum lift capacity of 700 lb. at the front bumper. COMPLY
3. A large boom swing is advantageous, providing the operator with a larger work area. The boom shall rotate by hydraulic power a minimum of 160 degrees, (90 degrees right and 70 degrees left of the truck center line). Boom rotation shall be unobstructed within the 160 degrees horizontal movement regardless of boom lift angle. State total boom swing to each side. COMPLY
Cor-Ten steel 3/16" wall
4. A large boom extension is also advantageous, providing the operator with a larger work area. The boom shall telescope a minimum of 8 feet straight forward from the full retracted position without having to add tubing or change steel elbows. State the total length the boom can be extended. EXCEEDS: 240 degrees rotation, 120 degrees each side.
5. Elevation of the suction inlet tube will not change while the boom telescopes. EXCEEDS: 10 feet telescopic. See drawing
6. Control of the boom shall be by means of a joystick control at the operator's station, requiring no cables at operator's feet for boom operation. COMPLY
7. The joystick shall have a safety lock-out button which must be activated in order for the joystick to function. COMPLY
8. A six-way pendant control shall be provided for remote operation of the boom and have adequate cord length to reach entire working area of boom. COMPLY
9. Eight-inch aluminum pipe extensions to clean to 20 feet shall be carried on the truck as follows: One 6.5 foot nozzle, and one of each 6 foot, 5 foot and 3 foot. In addition, 20 feet total of 6-inch pipe plus adapter shall be carried on the truck. COMPLY
10. Tube storage rack or racks shall be supplied. The racks will be capable of holding all the suction tubes specified in 9 above. These are to be stored on a "Lazy Susan" style rack or a powered (electric, pneumatic or hydraulic) fold down type side rack. Either style must allow easy access to the tubes from ground level. Specify the style rack offered, and the advantage of this style rack. COMPLY
Lazy Susan
11. The boom elbow shall be capable of being disconnected, unplugged, and re-connected in 20 minutes or less. The COMPLY

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boom elbow shall be capable of being completely replaced in 30 minutes or less.

- 12. A boom tie down with lock shall be supplied to keep the boom in stationary position while unit is traveling over the road.

COMPLY

JET RODDER HOSE REEL ASSEMBLY:

- 1. A jet rodder hose reel with a minimum 30-inch inside diameter and a capacity of 600 feet of 1-inch I.D. sewer hose shall be mounted on the front of the vehicle.
- 2. The hose reel shall be hydraulically powered in both directions. Describe hydraulic drive system.
- 3. The controls for operating the hose reel drive motor shall incorporate a flow control device to regulate the rotational speed of the reel in both directions.
- 4. If a chain and sprocket drive is used, it shall have a protective guard to prevent operator contact.
- 5. The hose reel shall articulate, swing, or rotate a minimum of 175 degrees allowing operator to work in any position through this arc. State the total rotation of the reel offered.
- 6. An automatic level wind guide shall be provided on the hose reel.
- 7. Bypass valves shall be supplied to allow the operator to manually rotate or telescope the reel in order to tilt the hood and check fluids without starting the engine.
- 8. All controls for operating the high pressure water system will be mounted on this reel assembly frame.
- 9. A hose footage counter shall be supplied. The footage counter will pivot on sealed permanent lubricated bearings.
- 10. A water pressure gauge shall be provided at the front hose reel operator's station.
- 11. The hose reel assembly and boom rest shall swing clear so as not to interfere with chassis engine servicing.
- 12. A means shall be provided of towing the truck without damaging the hose reel or any of its associated structure or components. This can be in the form of a tow bar or other means to allow a typical tow vehicle to attach and tow. The towing method or arrangement must be documented in the operator's or service manual. Describe what provisions have been made for towing. Include pictures, drawings or operator's manual pages of towing arrangements if available.
- 13. The hose reel shall remain stable throughout the range of normal working conditions and hose retraction. Describe the reel features that improve its stability.

COMPLY

COMPLY

COMPLY

COMPLY

EXCEEDS: 180 degrees articulation.

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY: Hydraulic outrigger stabilization leg.

WATER SUPPLY AND WEIGHT LIMITS:

- 1. The water tanks shall have a minimum usable capacity of

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- 1200 gallons.
2. The water tanks shall be constructed of cross-linked polyethylene, aluminum or stainless steel. EXCEEDS: 1300 gallons
3. The water tanks will be mounted as low as possible to provide a low center of gravity for truck stability. Describe tank mounting location. COMPLY
4. The cab and chassis with a driver, a passenger and fuel, with a 200 inch wheel base, a 200 inch cab to axle, 58 inch front bumper to cab and 256 cab to rear of frame, will have a front axle ground weight of 11,505 pounds and a rear axle ground weight of 7,810 pounds. The fore and aft placement of the water tanks in relation to the debris body shall be such that with all options installed the front axle weight does not exceed 20,000 pounds and the rear tandem axle weight does not exceed 34,000 pounds. Provide the axle weight calculations for the completed unit per this specification in the following loading configuration: COMPLY
- (a) Fresh water tanks empty, 300 pounds of tools and equipment, and 8 cubic yards of debris in the debris tank.
- (b) Fresh water tanks full, 300 pounds of tools and equipment, and the debris body empty.
- (c) Provide the calculations showing the maximum number of gallons of fresh water that may be carried with a full debris tank. The following warning (or one to the same affect) must be included in the operator's manual and displayed in the cab in view of the operator:
- DO NOT OPERATE THIS TRUCK WITH A FULL DEBRIS TANK AND MORE THAN (XXX) GALLONS OF WATER IN THE FRESH WATER TANKS**
- Where XXX equals the maximum number of gallons of water that can legally be carried with the full debris tank.
- 5 Repeat the above analysis for the five cubic yard debris body and 1000 gallons of fresh water. COMPLY
- 6 The water tanks shall be independent from and not rise with the debris tank. COMPLY
- 7 An air gap anti-siphon device to fill the water tanks shall be installed. COMPLY
- 8 A 2-1/2 inch diameter, 25 foot long hydrant hose with threaded firehose connections on both ends. Clamp on fittings are not acceptable. A storage container for the hose will be installed on unit. COMPLY
- 9 A fill filter or strainer shall be installed at the fill point. COMPLY
- 10 Water tanks shall be equipped with an access hatch for inspection, flushout, gravity filling and for adding chemicals to the fresh water supply. COMPLY
- 11 A sight gauge or other means to indicate water level will be COMPLY

ITEMS REQUIRED

RESPONSE

- located within sight of the operator station.
- 12 A water level indicator or low water indicator light shall be provided at the front hose reel. COMPLY
 - 13 The water tanks shall have a minimum 10-year non pro-rated replacement warranty for damage or failure of any kind, including but not limited to, side and top impacts. The only excluded damage shall be deliberate puncturing by vandals. COMPLY

HIGH PRESSURE WATER PUMP:

- 1. A variable flow high-pressure water pump, rated at a minimum of 0 to 80 gallons per minute and 0 to 2500 psi, with continuous pressure and flow, shall be supplied on the unit. The variable flow water system shall be capable of continuously delivering at least 80 GPM at 2000 PSI or 65 GPM at 2500 PSI. Describe the pump offered. Include the make, model and performance data. COMPLY
- 2. The high pressure water pump system shall be capable of offering both smooth and pulsed water flow. An accumulator may be provided to convert pulsed flow to smooth continuous flow. If smooth water flow is already provided then, a means must be provided to generate a pulsed flow. Either the accumulator or pulse generator shall be capable of being switched in and out. Describe the pulsing or un-pulsing system offered. Describe the advantage of this type of system. COMPLY
- 3. Controls for flow selection shall be at the front operator's station near the hose reel. COMPLY
- 4. The water pump shall operate independently of the vacuum system and be powered by the auxiliary engine via direct belt drive or the chassis engine via PTO and hydraulic drive. COMPLY
- 5. Controls for starting/stopping the water pump and to vary the flow and pressure shall be at the front hose reel operator's station. COMPLY
- 6. Ball valve or valves shall be provided for complete drainage of the high pressure pump and lines for subfreezing storage. COMPLY
- 7. A valve, of the same or greater size as the pump inlet line, shall be provided so the flow of fresh water to the pump can be shut off for maintenance. Means must be provided to lock the valve in the open position to prevent accidental operation with the valve closed. COMPLY
- 8. Describe the pump susceptibility to cavitation. Describe the system design features that prevent pump cavitation from occurring. COMPLY
- 9. Describe the pump susceptibility to over pressurization if a line is blocked or plugged. Describe the design features that prevent pump over pressurization from occurring. COMPLY
- 10. An inlet filter or filters, rated at a minimum of twice the pump flow, shall be provided in the pump inlet line. The filters and housings are to be made of a corrosion resistant material. COMPLY

ITEMS REQUIRED

RESPONSE

- State the rated flow and the material and any surface treatment used in the housing and filter screen.
11. State the spare parts replacement cost, rebuild costs and estimated lead time for the major components in the high pressure water pump system.

COMPLY

WATER SYSTEM PURGE:

1. A system shall be provided for air purging of the water system to prevent damage from freezing. The system shall utilize air from the truck chassis. Describe the purge system.

COMPLY

AUXILIARY ENGINE:

1. The auxiliary engine for the storm drain and catch-basin cleaner shall be diesel fueled, four stroke, water cooled, inline type with adequate power for its application. The auxiliary engine shall be used to drive either the water pump or the centrifugal compressor, but not both. The engine must meet EPA Tier 2 emission requirements. State the make, model and performance data of the auxiliary engine used.
2. Engine filters shall be spin-on type where practical. Filters shall provide full protection for the engine and be sized for "severe service duty." The filters shall include the following:
 - a. Fuel filter with water separator.
 - b. Oil filter
 - c. Air cleaner, heavy-duty with pre-cleaner (location to be such that the chassis engine exhaust is not ingested.)
 - d. Cooling system filter anti-corrosion, resistor-coolant type.
3. The cooling system for the engine shall provide proper cooling with an ambient temperature range from minus 30 degrees Fahrenheit to plus 100 degrees Fahrenheit.
4. The engine shall be capable of cold weather starting using only controls on the auxiliary engine control panel.
5. The engine shall be equipped with a critical silencer muffler. The exhaust system shall have a 90 degree elbow, if vertical to minimize the entry of rain water. State the sound pressure level in dBA of the engine at operating speed.
6. The engine instrumentation shall include water temperature, ammeter, hour meter, tachometer, and oil pressure gauges.
7. The engine shall be equipped with a 12-volt electric system to include starter, alternator and battery.
8. The engine shall be equipped with a low oil pressure-high temperature shutdown. Switch gauges shall not be used for shutdown devices.
9. The auxiliary engine shall obtain its fuel from a tank supplied with the truck chassis.
10. The auxiliary engine will be enclosed. The fan will be completely enclosed inside a fan guard.

COMPLY

Deutz, BF4M2012C
See attached performance data.

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

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COMPLY

COMPLY

ITEMS REQUIRED**RESPONSE**

- | | |
|---|--------|
| 11. Controls to stop and start the auxiliary engine shall be located at the front hose reel operator's station. | COMPLY |
| 12. The auxiliary engine throttle control shall be located at the front hose reel operator's station. | COMPLY |
| 13. A 110-volt AC thermostatically controlled immersion block heater shall be installed on the auxiliary engine and connected to a weatherproof receptacle (J. Jeb plug kit PK1212 or equal) on the driver's side of the cab. The receptacle shall be separate from the chassis engine immersion heater receptacle, | COMPLY |

CATCH BASIN CLEANING SYSTEM:

- | | |
|--|------------------------------|
| 1. The high pressure pump and water supply tanks furnished for the jetting system shall also be used to supply a minimum of 20 GPM water to a hand gun system with a relief pressure setting of approximately 600 PSI. | COMPLY |
| 2. One full functioning hand gun shall be supplied with on/off handle, replaceable nozzle tips, and one foot extension hose with quick disconnect fitting. The tips will consist of a sand type penetrator nozzle, a round head sanitary nozzle and a 15 degree penetrator nozzle. | COMPLY |
| 3. 50 feet of ½ inch high pressure hose with quick disconnect fitting shall be provided on a on a spring retract hose reel, to supply water under pressure to the hand gun. This reel is to be mounted on the curb side of the vehicle. | COMPLY |
| 4. A lateral cleaning kit, which consists of an additional 150 feet of ½ inch hose installed on a hose reel, shall be mounted at the driver's side front of the vehicle. | Recommend curbside mounting. |
| 5. The hand gun shall also attach to the system via quick-couple type connections at the front, rear, curb and driver's side of the unit. | COMPLY |
| 6. A handgun storage rack or tube shall be provided for the gun when not in use. | COMPLY |

JET HOSE AND NOZZLES:

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|---|--------|
| 1. A 600 foot x 1 inch high pressure jet hose, rated for minimum 3000 PSI working pressure and 7500 PSI burst pressure shall be provided on the unit with the following items:
a. Leader hose, 1" x 10'.
b. Heavy-duty hose guide (Tiger Tail).
c. Hose level wind hose guide.
d. Sand-type penetrator nozzle, 15 degree, 60 GPM, 2000 PSI.
e. Round head sanitary nozzle, 30 degree, 60 GPM, 2000 PSI
f. Penetrator nozzle, 15 degree, 35 GPM, 2500 PSI minimum
g. Radial nozzle, 30 degree, 35 GPM, 2500 PSI minimum | COMPLY |
|---|--------|

ITEMS REQUIRED

RESPONSE

TOOL BOXES:

- | | |
|---|--------|
| 1. Polished aluminum or stainless steel tool boxes, as large as possible, shall be installed on each side of the unit. Tool boxes will have 3-point locking stainless T-handle latches or Sr. Engineer approved equivalent. The tool boxes shall be water proof. The tool box doors shall open upward with air shocks. Floors shall slope downward one inch from the front to back with drain holes at the lower corners. An expanded metal, aluminum or stainless steel, grating shall be installed in the bottom of each box. | COMPLY |
| 2. A full width cross box approximately 16" x 42" x 96" will be installed behind the cab. The cross box shall be water proof. It will have doors that open at each end. | COMPLY |
| 3. Storage provisions shall be provided, in addition to the tool boxes described above for all hoses, pipe extensions, and all other loose items required and provided with the unit. | COMPLY |

MISCELLANEOUS FEATURES:

- | | |
|---|--------|
| 1. Any special tools required for normal operation, maintenance, and adjustment of the storm drain and catch-basin cleaner shall be provided. | COMPLY |
| 2. A hydrant wrench shall be furnished with the cleaner. | COMPLY |
| 3. A closed circuit rear vision back up camera and monitor system shall be installed. Describe system offered. | COMPLY |
| 4. Centralized lubrication area, manifold or system is to be provided. The system is to consist of no more than two locations, reachable from ground level, for lubricating the grease points throughout the body. Describe system offered. | COMPLY |
| 5. A six (6) inch work vise is to be installed on or near the rear bumper. | COMPLY |
| 6. Two ring style cone holders for 24 inch cones will be installed near the rear bumper. | COMPLY |
| 7. One (1) hand held spotlight with 40 foot cord and autoreel. | COMPLY |

PRE-BUILD MEETING:

- | | |
|---|--------|
| 1. The winning proposer will be required to attend a pre-build meeting at a City of Seattle facility, to be determined after award, for the purpose of reviewing options chosen and resolving any potential problems of mating up with the cab/chassis. | COMPLY |
|---|--------|

COLOR:

ITEMS REQUIRED

RESPONSE

1. The unit shall be painted white, Dupont Imron 5000 N0010, or Senior Mechanical Engineer approved equivalent, with no additional stripes or styling enhancements and no advertising. A contractor's identification label, no larger than 8 inches by 4 inches may be affixed to the side or rear of the unit.

COMPLY

OPTIONS:

1. Quote a 2-1/2 inch firehose threaded male connector will be provided to drain the fresh water tanks. A shut off valve will be located in the line where it can be easily reached. This drain will be used to enable the vehicle to be used for water storage and transportation for special Fire Department applications.
2. Quote an air activated knife decant valve.
3. One of the cleaners may be used for ditching work. Explain what extra equipment would aid slow speed ditching work, how it would aid, and prices for this equipment.
4. Quote 24 inch wide cross box in lieu of 16 inch wide box.
5. A tool, accessory and options price list is to accompany the vendor's proposal.
6. Quote Loadman on board scale system with a digital display in the cab, visible to the driver.
7. Quote a five (5) yard debris body in lieu of the nine (9) yard body in the base spec.
8. Quote 1000 gallon fresh water tanks in lieu of the 1200 gallon water tanks in the base spec.
9. Quote guarding for all exposed lighting that could be hit by overhanging tree branches.

\$600.00

\$1,668.00

\$20,000.00

\$2,000.00 Note: Requires extra CT on chassis.

See Attached

\$7,500.00

No change

Deduct -\$1,500.00

\$465.00

PROJECT MANAGEMENT:

1. The bid price submitted shall include the cost of having two (2) City of Seattle employees travel to the vendors assembly facility when the vehicle reaches approximately 85% complete (based on manufacturing schedule), agree on locations for controls, emergency lighting and inspection of manufacturing quality control.
2. The unit may be inspected at any time during construction. All costs for travel meals and lodging associated with the above mentioned specification reviews, and/or construction progress inspection trips shall be borne by City of Seattle if within the greater Seattle area. Any travel that requires an excess of 2.5 hours one way from The City of Seattle's Fleet Services Shop at 805 South Charles Street, Seattle, WA 98134 shall be paid by the contractor.
3. State a deduct price for deleting the project management requirement of this specification.

Deduct -\$1,800.00

ITEMS REQUIRED**RESPONSE****CHASSIS PICKUP:**

1. The vendor shall pick up the chassis at 805 Charles Street, Seattle, Washington. The vendor shall be responsible for all transportation costs. This fee must be included in your base bid.
2. Quote price deduction for having the cab chassis shipped directly to the proposer's assembly facility. State location of facility.

COMPLY

Deduct -\$3,200.00
 Vac-Con, Inc.
 969 Hall Park Drive
 Green Cove Springs, FL
 32043

DELIVERY:

1. State estimated delivery after receipt of the cab / chassis.
2. Deliver the completed unit FOB to:
 City of Seattle
 Fleet Services Shops
 805 South Charles Street
 Seattle, WA 98134
 Contact the Truck Shop Operations Supervisor, Mr. John Sattler, at 206-386-1153 for further instructions.
3. The unit shall have full dealer preparation and be ready for service when delivered.
4. All equipment and components necessary for operation and normally supplied shall be furnished, even if not called out in specifications.
5. Three complete sets of keys for all locks shall be provided.
6. Three (3) copies each of the following manuals are required at time of delivery:
 - a. Operator, service, and parts manuals covering the body and controls and all equipment supplied for sewer and drainage cleaning.
 - b. Any and all available manuals and parts lists in CD-ROM format shall be supplied.
7. A spare filter cartridge set (hydraulic, air, water, etc.) shall be delivered with the unit. The set shall consist of all filters used on the unit and shall be packaged as a group in a plastic water proof bag.

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

COMPLY

TRAINING:

1. Unit price shall include a minimum of 8 total hours of mechanic training and 8 hours total of operator training to be conducted in as many as 4 separate sessions.
2. Training will be conducted at the City of Seattle Shops at 805 Charles Street, Seattle, WA 98104. Contact John Sattler at 206-386-1153 to coordinate the training sessions.

COMPLY

COMPLY

ITEMS REQUIRED

RESPONSE

PRODUCT SUPORTABILITY:

- | | |
|--|--------|
| 1. State the location of the closest parts and service facility, how much parts inventory is carried for the offered product at this facility, how many factory trained and / or certified mechanics are employed at this facility, and how many customers does this facility serve? | COMPLY |
| 2. Provide in detail how you intend to support your product. | COMPLY |

WARRANTY:

- | | |
|---|--------|
| 1. It is advantageous for the City to have a full time, complete local (within 50 mile radius of FFD shops located at 805 South Charles Street, Seattle, Washington 98134) parts and service facility offering factory authorized service and a parts supply adequate to perform complete warranty repairs. State the location of the service facility, distance from the City shops, number of factory trained mechanics, size of parts inventory and procedure for obtaining repairs and parts. | COMPLY |
| 2. In addition to any warranties offered by the truck chassis manufacturer and OEM suppliers, and in addition to other warranties required in this specification, the contractor shall warrant the sewer and catch basin cleaner, water jet and all of its components and systems against all systems and component failures for period of 3 years starting with the City of Seattle's in-service date. | COMPLY |
| 3. Any portion of the contractor's standard warranty that exceeds the term of 3 years shall apply to this contract. | COMPLY |
| 4. The warranty shall not apply to vandalism. | COMPLY |
| 5. Warranty service and recall work must be performed by seller and seller must accept responsibility for transportation Contractor must respond to a call for warranty service within 24 hours. All costs of warranty repair and service including shuttling shall be borne by the contractor. | COMPLY |
| 6. Warranty shall begin on date unit is placed into service, not delivery date. Contractor-provided delayed warranty forms will be completed and returned when vehicle enters service. | COMPLY |
| 7. A copy of all applicable warranties must be submitted with bid package. Additional data entry form shall be completed and delivered with vehicle. | COMPLY |

ADDITIONAL DATA ENTRY FORM:

- | | |
|--|--------|
| 1. The equipment additional data entry form shall be completed and delivered with the unit. See attached sample. | COMPLY |
|--|--------|

EXTENDED USE CONTRACT BEYOND THE INITIAL MODEL YEAR OFFERED:

1. Extended use of this proposal and any subsequent contract resulting from this proposal is desired.
2. Quote extended price escalation factors for ordering trucks using this proposal on attachment 2 (Financial Proposal) for ONE (1), TWO (2), THREE (3), FOUR (4) and FIVE (5) years from the date this proposal is submitted to the City of Seattle.

****** IMPORTANT ******

The manufacturer's local representative must print the representative's firm name, address, phone number and the VIN number on all written warranty statements and/or manuals. Additionally, all such warranty instruments must be complete with all manufacturer/dealer responses contained therein (typewritten or neatly printed in ink, no exceptions) before acceptance of the vehicle/equipment will be made.

UNIT PRICE

\$ 179,540.00

Blf

MANUFACTURER

VAC-CON, INC.

MODEL QUOTED

V309LHA/1300

COMPANY

ENVIRO-CLEAN EQUIPMENT, INC.

1-800-200-8480

(PRINT)

(PHONE)

NAME

BRADLEY L. LOWE

PRESIDENT

(PRINT)

(TITLE)

I have read and understand the above specifications.

SIGNATURE

Bradley Lowe
Bradley Lowe

September 18, 2004

(DATE)

