Purchasing Department
Duane McKinney
Purchasing Coordinator
730 Wisconsin Avenue
Racine, WI 53403
262-636-3700
fax: 262-636-3763

January 27, 2020

Dear Prospective Bidder:

You are invited to submit a bid to provide Racine County with One (1) New Current Model Year single axle truck, dump body with a sloped asphalt tail section, liquid prewet system, and a hydraulic system to control a front plow and right-hand front mounted wing plow. Sealed bids are due on or before 2:00 p.m. on Thursday, March 5, 2020 at the above address. Late bids will not be accepted.

Responses must be in a sealed envelope or box and show the firm's name, address, and solicitation number on the cover. Your response must be manually signed and dated and include all requested information.

Any general questions regarding this Invitation For Bid may be directed to Crystal Moore, Finance Manager at (262) 636-3522 between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday or via electronic mail at Purchasing@racinecounty.com

Arrangements to view the trade-in unit and technical questions may be directed to Brett McDonald, Shop Operations Manager, at (262) 886-8446 between the hours of 8:00 a.m. and 3:30 p.m., Monday through Friday.

No other Racine County employees or representatives other than those specified above are authorized to provide information or interpret any portion of this solicitation. No contact from a vendor to any Racine County employee or elected official should be made during this process unless authorized by Racine County Finance Department.

Sincerely,

Duane H McKinney

Duane H McKinney
Purchasing Coordinator

Encl: Bid Package

CERTIFICATION OF VENDOR

Bid # 2020-PW-11

SINGLE AXLE DUMP TRUCK

I fully understand the requirement of the County of Racine and certify on behalf of my Company that we can meet the requirements stated above.

SIGNATURE: _____

TYPED/PRINTED NAME: _____

TITLE: _____

COMPANY: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

TELEPHONE: _____FAX: _____

E-MAIL: _____

DATE: _____

BID FORM

Truck Vendor:_____

Truck Body Equipment Vendor(s):_____

_____

PRICE: - A New Current Model Year Single Axle Dump Truck(s) with Snow Plow(s), Patrol Wing(s), Pre-wet system(s) and tailgate spreader(s).

	Truck #1
TRUCK CHASSIS Make/Model: _____	$_____ea.
DUMP BOX and HYDRAULICS Make/Model: _____	$_____ea.
SNOW PLOW complete with HITCH: Make/Model: _____	$_____ea.
RIGHT SIDE PATROL WING complete: Make/Model: _____	$_____ea.
PRE-WET SYSTEM Make/Model: _____	$_____ea.
HYDRAULIC TAILGATE SPEADER Make/Model: _____	$_____ea.
Manufacturer Discount-Deduct	$_____ea.
TOTAL for Truck	$_____
TRADE IN ALLOWANCES-Racine County Vehicle Numbers 2004 Sterling L7501 Single Axle Dump W/Plow & Wing-Deduct	$_____

****NET BID PRICE:** ****

This is a firm bid price complete as specified **$_____**

SPECIFICATIONS / MINIMUM REQUIREMENTS

Bid # 2020-PW-11

SINGLE AXLE TRUCK

List Model Bid: _____

MINIMUM SPECIFICATIONS	EXCEPTIONS
1. TYPE	
A. 4x2 Single Axle Truck-Current Model Year.	_____
B. CA to accommodate specified frame mounted tank and dump body.	_____ in.
C. List Model Bid.	_____
D. GVWR-46,000 lbs. Minimum	_____
E. Wheel Base to accommodate specified frame mounted tank and dump body.	_____ in.
2. AXLES	
A. FRONT-20,000 lb. minimum rating.	_____
B. REAR-26,000 lb. minimum rating through hubs.	_____
C. SEALS-SKF Scotseal Plus XL or equal.	_____
3. BRAKES	
A. Full Air Brakes-S-Cam Type.	_____
B. FRONT-S-Cam 16 ½" x 6".	_____
C. REAR-S-Cam 16 ½" x 7".	_____
D. Rear Chambers: 30-30 Type. Shall be front mount to accommodate paving equipment.	_____
E. Low pressure warning system.	_____
F. ABS Brake System.	_____
G. Meritor Automatic type slack adjusters.	_____
H. Wabco 1200 SS Air Dryer with heater	_____
I. Manual drain valves.	_____
J. Air Compressor-18 CFM minimum.	_____
K. Parking Brake-On rear axle, spring set w/ dash-mounted control.	_____
L. Chassis Air Lines-extruded nylon, 3/8" and larger, polyester reinforced.	_____
M. Dust shield covers for each wheel.	_____
4. CAB EQUIPMENT	
A. Shall be custom interior to include but not limited to: full trim panels on doors, back of cab insulation, headliner insulation, and cloth seats.	_____
B. Tilting fiberglass hood with butterfly inspection hatches.	_____

C. List construction of cab: _____ _____
D. Premium high back cloth air suspension driver's seat with 3 chambered air lumbar, integrated cushion extension, forward and rear cushion tilt and adjustable shock absorber. _____
E. Passenger seat with fixed base to match driver seat. _____
F. Arm rests both right and left seats _____
G. Retractable seat belts on both driver and passenger seats. _____
H. There shall be assist handles on the outside of cab, right and left, non-corrosive or equal. Assist handles will also be installed on the inside of the right and left door, stainless or equal. _____
H. Four-way flashers. _____
I. Pre-trip exterior light inspection switch to allow operator to check all exterior lights are functioning. _____
J. Snow shield to cover air intake for cab. _____
K. Individual analog type gauges will include the following:
    i. Air pressure gauge with buzzer
    ii. Voltmeter gauge
    iii. Engine coolant temp gauge with light and buzzer
    iv. Engine oil pressure gauge with light and buzzer
    v. Fuel level gauge
    vi. Electronic speedometer
    vii. Electronic tachometer with hour meter
    viii. Transmission oil temperature gauge. _____
J. Vinyl floor mat with insulation. _____
K. Removable driver's and passenger side HD rubber mats. _____
L. Heater and defroster w/side window defrosters. _____
M. Dual air horns w/ single base and covers, along with a single electric horn. _____
N. Tinted and heated front windshield. _____
O. Extreme climate thermal insulation _____
P. Rear Cab Window. _____
Q. Padded sun visors-right and left. _____
R. Heated west coast style mirrors, RH & LH _____
S. Convex mirrors-8", mounted lower arm of west coast mirrors-RH & LH. _____
T. Clearance lights-standard configuration _____
U. Electric windshield washer and electric 2-speed intermittent wipers with heavy duty "winter style" wiper arms and blades. _____
V. Steering Wheel-approximately 18", tilt and telescoping. _____
W. Radio-factory installed AM/FM. _____
X. Factory installed outdoor air temperature gauge installed in dash _____
Y. Commercial 5 year rust through warranty, both cab and chassis. _____
Z. Turn signals-signal stat, self-cancelling. _____
AA. Passenger side door lower door window with Fresnel lens. _____
BB. Standard factory installed headlights, high and low beam. _____
CC. Cab color-Omaha Orange or equal. GM-WE9417 (94W) _____
DD. Greaseable Steering Column U-joints (dealer installed) _____
EE. Overhead console with a 2-Way Radio wiring accommodation package. Wiring must be at least **12ga** to accommodate a 40W radio_____
FF. Winter fronts installed on stationary grill. _____

5. **ELECTRICAL SYSTEM**
   - A. 12 volt system _____
   - B. Batteries-two (2), 12volt, 2200 CCA at zero degrees. _____CCA
   - C. Alternator-12V, 160 amp, 28-SI. _____AMP
   - D. Batteries located under cab. Batteries are to be installed in a fully enclosed battery box _____
   - E. Heavy duty electrical wiring system and dash components commonly referred as "Fleet". **Splicing of wiring to meet\specifications is not acceptable.** _____
   - F. Complete LED, ICC lighting system w/ two (2) halogen bulb headlights. _____
   - G. Rear lights combination, stop, tail, directional, and back-up to be between frame rails. _____
   - H. Shall have circuit breakers in lieu of fuses. _____
   - I. Shall have a chassis manufacturer factory installed trailer brake light accommodation package with a 7 flat pin connector to rear of frame. _____
   - J. Shall have factory installed plow head light wiring and auxiliary harness for front headlights & turn signals for plow lights. _____
   - K. Remote jump start posts located on driver's side of truck _____

6. **ENGINE**
   - A. Diesel-300 HP minimum _____
   - B. Specify make. _____
   - C. Specify model. _____
   - D. Minimum Torque – 860 ft. lb. _____
   - E. Air intake-inside/outside with in cab control _____
   - F. Air to air after cooling. _____
   - G. Engine hoses and tubing-Gates Blue Stripe. _____
   - H. Air operated on/off fan clutch _____
   - I. Heated Fuel/Water separator _____
   - J. Stainless steel oil pan _____
   - K. All daily under-hood checks located on driver's side _____
   - L. Oil filter is engine mounted and disposable. _____
   - M. Delco 12V 39MT+HD/OCP including thermal protection & integrated magnetic switch. _____
   - N. Long life coolant protection to –34 degrees below zero. _____
   - O. Exhaust-single horizontal muffler. Vertical Exhaust, with perforated stainless metal guard. (Not to reduce cab to axle dimensions and not to force distance between cab and box in excess of 5 inches.) _____
   - P. Radiator/Grille guard screen ¼" mesh-stationary type. _____
   - Q. 5yr., 100,000-mile warranty for all engine components, including turbo, electrical, and **any/all** exhaust aftertreatment components. Provide an itemized listing off all covered/non-covered items. _____
   - R. Engine to be supplied with a fuel primer pump _____
   - S. All electronic controls modules for chassis electronic control unit, trailer, transmission, ABS, chassis, multiplex systems to be mounted in CAB. **NO EXCEPTIONS! All modules must be in cab to prevent corrosion.** _____

7. **CHASSIS**
   - A. Frame-Single channel 120,000-KSI steel. _____
   - B. Side rail section modules 15.9 in. _____
   - C. List RBM, minimum 2.6. _____
   - D. 20" integral front frame extension adequate for plow mount installation. Not less than 14 inches from grill. Must be part of parent rail continuous of main frame _____
   - E. 14" extension beyond rear of rear tires _____
   - F. Tow hooks, front and rear. _____
   - G. Aluminum fuel tank-left hand 70-gallon step tank with non-skid tread with stainless steel hold down straps. _____
   - H. Electronic 112 db backup alarm installed. _____
   - I. Frame painted gloss black _____
   - J. Trailer towing package at rear of truck. _____

8. **DIFFERENTIAL**
   - A. Meritor Differential _____
   - B. Differential to be geared for 65 MPH. _____
   - C. No spin rear axle. _____
   - D. Synthetic gear oil. _____
   - E. Have protection from dissimilar metal corrosion between wheels and wheels to hubs _____

9. **TRANSMISSION**
   - A. Automatic Allison 3500 RDS. _____
   - B. Wide ratio six (6) speed. _____
   - C. Synthetic "TranSynd TES-295" lubricant _____
   - D. On dash Push Button Shifting _____
   - E. Prognostics Enabled _____
   - F. Transmission cooler. _____
   - G. Full 2-year warranty. _____
   - H. Electronic Controls mounted inside of cab. _____
   - I. Cruise control to start at 20 mph. _____

10. **SUSPENSION/SPRINGS/TIRES-RIMS**
   - A. Springs-front 10,000 lb., 20,000 lb. min. capacity. **Add two (2) leafs, or air bag, to right front spring to accommodate wing weight <u>prior</u> to chassis going to body builder.** _____
   - B. Air Bag Suspension on rear axle. Include Timbren supports in case of air system failure. Include operator controlled dump valve with automatic inflation system for airbags. Vendor must stay below the suspension rating for the airbag system, i.e. 26,000 lb. rating _____
   - D. Rear tires-11R 22.5 G rating _____
   - E. Front tires-315/80 R22.5 L rating. _____
   - F. Rims-Front-two (2) 9.0 x 22.5 ISO steel disc wheels. Powder coated light grey. _____
   - G. Rims-Rear-four (4) 8.25 x 22.5 ISO steel disc wheels. Powder coated light grey. _____

11. **MISCELLANEOUS**

A. Diagnostic Software

a. For Chassis that Racine County Does Not Have:

i. Provide any and all software, and one year of internet access for each as required to access **ALL** vehicle diagnostics and parameter settings (includes the engine, Allison "DOC" transmission software, antilock brakes, body building, and multiplexing electronic system(s)). Including a laptop, and any other hardware needed, capable of running all software

_____

b. For Chassis that Racine County currently owns:

i. If the all the software is currently the same as Racine County own, renew for one (1) additional year. If there is new software, install on the current Racine County laptop computer and allow access for one (1) additional year

_____

c. Included on computer software will be:
- Parts Manuals for Engine, Transmission, and ABS brake system
- Engine Repair Manual
- Shop Service Manual
- Electrical Service Manual with Schematics
- Emission Service Manual
- Service Bulletin with Updates _____

B. A **complete** set of service filters and belts for each truck ordered must be furnished when truck is **delivered** to Racine County. Provide list of filters being supplied in comment section. Any filters that are discovered at a later date (i.e. when truck is serviced) that were not delivered will still be the responsibility of vendor to provide at such date.

Initial: _____

C. Three ignition keys provided. _____

D. Vendor shall provide onsite instruction for two (2) individuals for servicing of major components such as engine, emissions etc. _____

E. Lubecore grease system for chassis, wing, and dump box. _____

HYDRAULICS FOR SINGLE AXLE TRUCK
"HYDRAULICS SHALL BE FORCE AMERICA WITH **NO EXCEPTIONS".**

1. HYDRAULIC PUMP

The hydraulic pump shall be a U.S. manufactured axial piston pressure and flow compensated load-sensing type. The pump shall be cast iron construction and rated to 6.00 cubic inches per revolution at maximum stroke which will deliver 24.7 GPM @ 1000 engine RPM. The pump shall have a 2" inch suction line and ¾" case drain line plumbed directly back to the reservoir. The pump shall be rated for 3000 PSI maximum and 2500 PSI continuous. The pump shall have a severe duty, high pressure outboard Teflon shaft seal that protects the pump shaft bearing and seal from external contamination and salt spray. The pump shall have a 1¼" keyed drive shaft and SAE type C mounting flange. The pump shall be **Force America FASD45L-KIT** or prior approved equal. _____

2. SHUTDOWN SYSTEM

A single normally open, two position, two way, poppet style solenoid valve capable of stopping oil flow to the hydraulic system when actuated. The valve shall be mounted directly to the hydraulic pump discharge port. The valve assembly must also incorporate a high pressure relief valve to protect the system from over pressurizing during system shut down. This solenoid valve shall be wired to a float type level indicator that is mounted from the top of the reservoir. The system shall be designed so that when the float contacts close, the solenoid valve stops pump flow and **an enunciator in the cab that is on a control panel alerts the driver**. The control panel will also incorporate an override switch wired to de-energize the shutdown system to facilitate diagnostics and equipment storage. The override panel shall also contain warning lights for body up and filter bypass. There shall also be a switch on the circuit board that will allow shutdown on high temperature condition as well as low oil.

_____

3. RESERVOIR / VALVE ENCLOSURE

The hydraulic reservoir will be of 35 gallons nominal capacity.
The hydraulic reservoir will be constructed of 10-gauge **stainless steel** and be internally baffled.
The valve enclosure lid will protect from both road and pressure washer spray.
For ease of removal by a single person, the valve enclosure lid shall weigh less than 22 lbs.
The valve enclosure lid shall be black high density polyethylene with stainless steel reinforcements.
The valve enclosure lid shall have molded integrated handle for ease of removal.
The valve enclosure lid shall be attached to the reservoir via (4) rubber straps that can be removed without the use of any tools.
Mounting bracket is to be designed and supplied by the reservoir supplier.
Mounting system should allow for a 1" frame clearance for frame obstructions.
Shall be mounted in a manner as to not transmit any truck torsional loads thru the tank.
The enclosure will use a gasket-less passive technology. (No rubber seals, gaskets, or weather stripping.)
The enclosure lid will be removable within seconds by one person without the use of tools.
All valve fittings, hose ends, filter, filler breather, sending units and any electrical connections are to be protected by enclosure cover.

The reservoir supplier will provide all valve fittings (JIC connections) and plumb the return line from the valve to the filter.
The cover will protect from both road and pressure washer spray.
The use of bulkhead fittings is not permitted.
The directional control valve must be easily accessible from all (6) sides without the use of tools.
Hose exit and entrance must allow for components to be mounted adjacent to the enclosure.
A 2" full flow brass ball valve shall be plumbed at the suction port of the tank.
A low oil/high temp sending unit shall be mounted in the reservoir.
The valve/tank assembly shall be a **Force America model "VT35G2-SP Valve/Tank Assembly"** or prior approved equal.
Hydraulic oil shall be equivalent to Service Pro AW 32 with **blue dye added**.

4. HIGH PRESSURE FILTER:

There shall be a high-pressure filter plumbed between the hydraulic pump and the control valve assembly. The hydraulic filter shall be a 25-micron absolute and rated for 6000 psi. The filter shall be model HP17125VG30EPUG5S2 or prior approved equal. This high-pressure filter shall not require an electric indicator.

5. FILTER

Hydraulic oil filter shall be mounted in the reservoir. Hydraulic filter shall be a 16-micron absolute and rated for no less than 70 GPM. Filter shall be model **TS1600251S0/ZSRE40910** or prior approved equal and include visual and electrical bypass indicators. The filter cartridge shall be constructed of a synthetic media. The return port in the filter shall be SAE #20 or larger. A warning light shall be mounted in the cab and wired to the electrical filter bypass indicator. The system shall be delivered with one spare filter element.

6. CONTROL CENTER

Controls for all valve functions and electronic spreader control will be integrated into a single, self-contained control center. The control center shall be a padded armrest style that is ergonomically designed. Control center shall be modular in design for ease of installation and service and wiring and connectors shall be keyed and color-coded throughout. All components must be durable for long life and trouble free operation.

The electronic controller shall be a fully proportional multi-stick controller to operate all cylinder functions. Multi-stick PWM driver electronics shall include as standard the capability to control at least 9 proportional outputs simultaneously. The control is available in a 3-stick, 4-stick, or 5-stick configuration. Controls for spreader must be located on armrest at the operator's fingertips. There shall also be four auxiliary rocker switches available with an additional fifth switch being the main power switch for the spreader control. The switches shall be located between the joysticks and spreader control interface and each shall be rated for 15 amps continuous current minimum. Console options shall be capable of supplying full rated power to switch outputs when all four auxiliary switches are at full 15 amp load.

For ease of operation the multi-stick control shall include the following features: LED-backlit nomenclature for all joystick functions and a momentary push-button at the top of the hoist stick to provide hoist-interlock. The “Hoist” decal shall be illuminated amber while disabled, and change to green backlighting when the driver engages the hoist interlock button. The green “Hoist” LEDs shall remain illuminated while the hoist is under operation and shall time-out after a period of hoist inactivity that is selectable from 0 to 15 seconds.

The plow, wing, scraper, or other joysticks shall have the option to include a momentary pushbutton for activation of remote spreader standby, remote spreader blast, or electric joystick interlock. The multi-stick communication hardware/software shall include 4 integral float options. The use of add-on float modules is unacceptable. For flexibility of use the integral float programming shall have the following standard features:

- (4) axis functional float on any or all of the outputs with selectable forward/back, right/left functionality
- 3-way or 4-way functionality
- Selectable (3) second float delay timer
- Optional float enable switch inputs.
- When float output for a given joystick function is active, the LED-backlit nomenclature shall blink ON/OFF to provide visual feedback to the operator that the float function is engaged.

To ensure longevity of performance all lighting to be solid-state LED technology. The use of incandescent lamps or EL backlighting is unacceptable.

All function joysticks shall be of contact-less Hall-effect design and offer up to a 5-Million cycle life. The use of potentiometers is unacceptable. To increase safety of operation, joystick communication hardware/software shall include the following standard features:

- Input power monitor circuitry with power quality diagnostics,
- Redundant dual-reference joystick signals for each joystick axis
- Joystick input off-center checking on all axes and output shutdown on system power-up
- Joystick out-of-range fault condition checking and output shutdown
- True outputs off with joystick centered
- LED-backlit nomenclature shall illuminate and flash RED when any error condition exists, and an audible alarm shall sound.
- LED-backlit nomenclature shall blink ON/OFF with increasing frequency as the corresponding function is increased in speed to give the operator visual feedback of each joystick output.

Multi-stick control shall communicate all joystick data over the spreader control CAN bus. For ease of service and diagnostics the multi-stick control shall have the following easily accessible through the spreader control calibration menus:

- Unique MIN/MAX adjustments for each joystick function (forward, back, left and right)
- On-screen output status indicators for each PWM output
- Audible and visible output error status indicators with flashing error codes for each joystick function

The multi-stick control joystick outputs shall be communicated over the spreader control CAN bus to the Valve Module. Spreader control outputs and joystick control outputs shall be operated on the same Valve Module, or multiple modules as necessary.

The electronic spreader control shall be designed for precise, closed-loop control of granular and prewet liquid applications and operate on a CAN Bus protocol. The Central Processing Unit (CPU) shall have keyed and color coded connections to prevent incorrect installation. The CPU shall be mounted in the cab with visual access to diagnostic LED's. Mounting of the CPU unit outside of the cab is unacceptable. The unit shall have USB connectivity for file and data transfer, Ethernet connection, a J1939 communication port for connection to the vehicle bus, a second CAN bus communication port for spreader-only data use, a J1708 connection for a road and air temperature sensor, and a RS-232 connection for AVL communication. The CPU shall have on-board diagnostics, which provide real-time status of CAN bus communication, processor activity, and power status. The CPU shall have a built-in audible alarm for diagnostic purposes. The CPU operating system shall NOT be Windows-based.

The spreader control interface shall have two, color-coded, continuous rotation encoders for granular and spinner control. These encoders shall have integrated push buttons for blast mode and stand-by. The controller shall have a third multifunction 4-way joystick that has an integrated rotary encoder and push button, that can be used for menu navigation, prewet liquid control, or an additional conveyor function. There shall be four, two-way soft keys included in the interface that are generically-labeled and user-configurable for different functions depending on the equipment needs. The controller shall also utilize USB technology that is capable of using a Supervisor key to provide access to the calibration parameters without the access code. The entire operator interface shall be backlit and encased in flexible silicone material with wear-limiting coating applied to the base silicone material. The operator interface shall communicate on the spreader control system CAN bus. The use of an LCD touch screen to change spreader function settings while driving is unacceptable.

The spreader control display shall be a remotely-mounted, 10" diagonal color TFT LCD with capacitive touch and a low-profile 16:9 widescreen format and minimum of 1024X600 pixel resolution. LCD shall have variable LED backlighting. CCFL backlighting is unacceptable. The display shall include a scratch-resistant polycarbonate lens with anti-glare coating. Display unit shall have a built-in audible alarm. To avoid driver distraction, the display shall have no integrated dials or pushbuttons. Display shall communicate on the spreader control system CAN bus. **Mounting of LCD shall be where a "normal" rear view mirror would be installed. It shall be installed in such a way that will prevent it from vibrating loose from its mounts over time.**

The operator menus shall be color-coded to match the encoder knobs on the operator interface. The display shall be capable of displaying the following on-screen simultaneously: Granular material name, granular material set point and actual application rate including units of measure, prewet liquid name, prewet liquid set point and actual application rate including units of measure, spread width, road temperature, air temperature, material usage total, liquid usage total, vehicle speed, and current date and

time. The operator shall have the option of selecting five data items to be displayed onscreen during operation. The display will also provide four warning light indicators for low oil level, body up, oil temp, and filter bypass. These warning lights are to be functional regardless of spreader operation or status.

The display shall have integrated antennas for GPS and cellular communication. Cab mounted antennas are unacceptable. The display shall be capable of communicating wirelessly with road and air temperature sensors.

A proportional PWM driver and input module (Valve Module) shall be remotely-mounted inside the hydraulic valve enclosure for control of both spreader control and joystick control outputs. The entire Valve Module shall be of rugged design for the mobile environment and must meet IP68 requirements for dust and water ingression. The Valve Module shall include a minimum of ten proportional PWM outputs with potted valve output connections. All outputs shall be protected against short-circuits. Outputs shall be current-compensated and have adjustable PWM frequency. There shall be a minimum of five switch-to-ground type inputs for monitoring hydraulic system inputs such as oil level, body up, High and Low filter bypass, and oil temperature warnings. A minimum of two switch-to-ground type pulse train inputs shall be included in the Valve Module for connection of feedback sensors such as auger feedback and prewet liquid flowmeter feedback. A keyed and color-coded connection shall be provided for CAN bus connection to the CPU module inside the cab. A second CAN bus connection must be provided for daisy-chaining of multiple Valve Modules within the valve enclosure. Diagnostic LED's shall be included for every input and output on the Valve Module, as well as a power status LED and CAN bus activity LED's. The Valve Module shall be potted.

The integrated spreader control and joystick control system shall be equipped with a qualified ESTOP device that immediately disconnects battery power from all outputs. All spreader control and joystick-operated outputs shall immediately cease to function and the system display shall inform the operator that the ESTOP device has been activated. The ESTOP device must remove power from all output devices, while maintaining power to the display and CPU for diagnostic purposes. Resetting of the ESTOP device shall not result in spreader control and joystick-operated outputs returning to an ON state without operator acknowledgement.

The Control Center shall be a FORCE America Patrol Commander MPJC Ultra series with a 6100 model spreader control. _____

Unit to be supplied with Precise MRM wireless road temperature sensor that will display on-screen. _____.

7. **AUGER FEEDBACK SENSOR KIT:**

Closed loop operation will require a feedback sensor coupled to the auger/conveyor motor via a mechanical coupler. The mechanical coupler shall adapt to either a 1" or 1.25" round shaft. The coupler shall be constructed of stainless steel and house a sealed bearing. The feedback sensor shall give 512 pulses per revolution without the use of a multiplier and be equipped with an IP-68 rated M12 connection. The sensor housing shall be a corrosion-proof delron material and the entire sensor assembly shall be potted encapsulated. Sensor shall be successfully tested for shock and vibration to MIL-STD-202. It shall be of hall-effect, bearing-less design, with a shaft-mounted magnet on the mechanical coupler and auger shaft. LEDs on the encoder shall provide

indication of power and feedback signal status. There shall be a M12 feed-through bulkhead fitting to provide an easy disconnect point at the back of the truck chassis and included in the kit shall be M12 cordsets and dust plugs for removal of the spreader from the chassis. The auger feedback sensor shall be a **FORCE America FB-512**

8.HYDRAULIC CONTROL VALVE

The hydraulic valve shall be of modular manifold design. Each hydraulic function requires an individual manifold stacked together to form the manifold base. The manifold base shall consist of an inlet section with SAE #16 inlet porting, SAE #20 outlet porting, and SAE #4 load sense porting. There shall be a main system relief in the inlet section to protect the system from high pressure in case the pump compensators fail. The dump body manifold shall be stacked next to the inlet section, and capable of 40 GPM with SAE #12 porting. The hydraulic control valves shall be pulse-width modulated, proportionally controlled. Each hydraulic valve segment shall be individually mounted to the manifold base assembly and be serviceable without removing any hydraulic hoses or any other hydraulic valve segments. Each hydraulic valve segment shall have individual pressure compensation to achieve independent simultaneous operations. All segments shall have heavy-duty continuous duty coils and connections shall be with Din connectors. All coils shall operate at 12 VDC and require a maximum of 1400 mille-amps. Each segment shall be equipped with a manual override except for the auger and spinner sections. The dump body segment shall be rated to 40 GPM, with all other segments rated to 20 GPM. If a double acting hoist is utilized, the dump body segment shall be equipped with a down side relief to protect the body down function. This relief shall be set to the hoist manufacturer's specifications. Valve segments shall be **Force America Add-A-Fold®** model or prior approved equal. The valve is to be arranged as follows:

Hoist	4-way with 500 PSI down side work port relief valve
Plow lift	4-way
Plow angle	4-way
Wing toe	4-way (*Please verify spool needed based on wing manufacturer*)
Wing heel	4-way with 1500-psi (A) port relief valve
Auger	4-way for reversing auger
Spinner	2-way
Prewet	2-way

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9. **CONTROL VALVE KICK-OUT**
   a. The body hoist cylinder shall be connected to control valve and provided with kick-out to prevent overextending the cylinder.
   b. A 904S-C-16 cable pull off valve plumbed between the valve and cylinder

10. **HIGH PRESSURE HOSE/TUBING**
   a. All hydraulic lines and plumbing shall be of sufficient capacity so as not to create heat or turbulence within hydraulic system. Suction line between reservoir and pump shall be a minimum of 2 in. I.D. with a minimum SAE 100-R4 rating and shall be secured on both ends via heavy duty banding straps, radiator hose clamps are unacceptable. All pressure hoses, including signal sense to pump shall have stainless steel swivel fittings on both ends and have a minimum SAE 100-R2 rating. Return lines and case drain shall have minimum SAE 100-R1 rating.

b. Hoses shall not be routed near exhaust manifolds pipes, bolts, sharp edges, exhaust system, etc. to prevent wear, fatigue, or fire. . Support brackets, grommets, and jackets shall be provided where appropriate to protect lines from damage by abrasion, cutting or impact. _____

c. Minimum working pressure of 3000 lbs psi and test pressure of 13,000 lbs. _____

d. Each hydraulic hose shall be sheathed with protective hose sleeve prior to having hose ends crimped. _____

f. ½" (minimum) stainless steel tubing to be run from front to rear of truck. All tubing to metal jacketed and separated (not wire-tied). Stainless steel fittings to be used on all stainless steel tubing. Maximum distance between support jackets on all hydraulic tubing shall be approximately 16 in. _____

g. All hydraulic hoses shall be Gates Megatough. 1/2" ID minimum supply and return lines. _____

h. Pipe fittings are not acceptable in any high-pressure line. No street ells are to be used. Only hydraulic fittings may be used. Black pipe and Galvanized pipe will not be accepted. _____

i. Two plugged tees provided in the return line for connecting the spreader return line to the hydraulic system. _____

j. All lines to attachments shall be equipped with **Pioneer 4050-4 and 8010-4 (with dirt covers)** quick couplers for quick assembly and removal of attachments. _____

k. All hydraulic quick couplers shall be mounted to the right rear side of the dump box. (See Dump Box specification 11.F) _____

11. **MANUALS PER UNIT**

A. One (1) parts manual for each accessory. _____

B. One (1) as built drawing (with pictures) showing locations of electrical connections made to chassis _____

DUMPBODY FOR SINGLE AXLE TRUCK

1. GENERAL

A. This specification is to describe a **Cross-memberless** dump body with trunnion mounted double acting front telescopic hoist. The body, as bid, will be a current design. Bidders will submit current literature for make and model bid. All items are to be stainless steel unless otherwise noted.

2. DIMENSIONS

A. Length shall be **11 ft.** 0 in. inside. _____ft. _____in.
B. Width shall be 84 inches inside. _____ft. _____in.
C. Capacity shall be 5-7 cu. yd. _____ cu. yd.
D. Sides shall be 24 inches high. _____in.
E. Headsheet height shall be 36 inches. _____in.
F. Tailgate height shall be 32” in. high. _____in.
G. Allow proper rear overhang of dump box for asphalt paving

3. SIDES AND HEADSHEET

A. One piece 7 gauge sides and front head sheet _____
B. Seamless boxed top and rub rails sloped outward. _____
C. One piece 7 gauge front and rear corner posts with 2 inch sideboard pockets _____
D. One welded on horizontal brace. _____
E. All seams are to be fully welded both inside and out. _____
F. The dump body rear body configured to standard style _____
G. Orange painted pine side boards installed. _____

4. FLOOR

A. The floor shall be 1/4-inch AR400, 180,000 PSI seamless floor. _____
B. Sides to be joined to floor by 5-inch radius, 10-gauge stainless steel. _____
C. Long sills from minimum 8” single piece steel I-beams. No splicing. _____

5. TAILGATE

A. 2 panel gate, 7 gauge with full perimeter boxing _____
B. Single intermediate horizontal tailgate brace. _____
C. Shall have double acting tailgate chains. _____
D. Upper and lower pins shall be 1-1/4” stainless steel. _____
E. Manually operated tailgate latch. _____
F. Latch hooks and latch plates made from stainless steel. _____

6. HOIST AND FRAME

A. Trunnion mount cylinder _____
B. Internal dog house which extends no more than 13” into load area _____
C. Two OSHA approved body props _____
D. Direct mount, no sub frame _____
E. Double acting hoist _____
F. Floor height 8” above frame _____
G. Nitrided cylinder _____
H. Body up light switch in Force 6100 _____

I. Class 60, 21-ton capacity, 50-degree dump angle _____
J. 8-inch I-beam frame. _____

7. **DUMPBODY LIGHTS**
   A. Tail lights shall be Truck-Lite 60050R recessed in dump body posts using rubber grommets. _____
   B. Lights must not weaken rear posts. _____
   C. All lights must conform to all State and Federal Standards. _____
   D. Wiring harness must be a sealed construction to prevent corrosion of wiring _____

8. **WARNING LIGHTS**
   A. Shall be J.W Speaker Model 274 Flash amber strobes with weather-pack connectors and be recessed in dump body post and connected to a switch in the Force 6100 control center. Lights will be connected to turn signal so when turn signal is on, flasher works as a turn signal. Video: https://youtu.be/_SfppSA8ks0 _____
   B. Two (2) Strobe lights shall be a Star Warning Systems 9018LED mounted solidly on top outer corners of cab protector and wired to Force 6100 control center. _____
   C. Shall install a J.W Speaker 670-12/24V HTD Worklamp AMB FLD, Item Number 1403491 salter light. _____
   D. Shall install a J.W Speaker 670-12/24V HTD Worklamp AMB FLD, Item Number 1403491 wing light. _____
   E. Contact Racine County prior to placement of lights. _____

9. **PLOW LIGHTS**
   A. Two plow lights shall be mounted on reinforced brackets on the front fenders so that their light beam clears the top of the plow moldboard in the raised position. The center of the lights shall be a minimum of 60" from the ground. _____
   B. The plow lights shall be JW. Speaker Model 9800 HS (p/n 0555743) _____
   C. Plow lights shall be connected to the headlight switch and have a selector switch. _____
   D. Plow lights shall be properly aligned for night time driving. _____

10. **ELECTRICAL SYSTEM**
   A. All wiring is to be double jacketed with ethylene-propylene rubber to keep out moisture and protect from damage. _____
   B. All electrical connections are to be made using Weather-pack connectors and protected from moisture entering connection. _____
   C. All junction boxes are to be completely waterproof. _____
   D. Any wires that are subject to abrasion are to be covered with vinyl tubing for additional protection. _____
   E. All lights are to be grounded through wiring system not to mounting bolts. _____

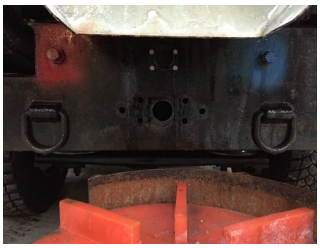
11. **GENERAL**
   A. Front step plates inside and out of box _____
   B. Stainless steel walk rail on driver's side of dump box. _____

C. One piece cab protector. Cab protector shall be sized accordingly to completely protect cab from damage and installed by fully welded protector to head sheet. Skip welds are unacceptable. _____
D. Left and right dump grab handles _____
E. Two (2) OSHA approved body props _____
F. Hydraulics for spreader and liquid tank shall be mounted to right side of dump box. Rear and sides of asphalt tail must be clear to allow use of paving and shoulder machines _____

G. Mud flaps mounted on rear with removable hooks. _____
H. Roll-Rite (only) brand asphalt tarp electrically controlled from cab _____
I. Must conform to all Federal and State regulations _____
J. Rust Proofing on the following:
    a. Entire underside of dump body floor. _____
    b. Truck Chassis. _____
    c. No rust proof holes in dump body or truck chassis. _____
K. A pre-build meeting shall be conducted at dump box vendor's facility **at approximately 10%** of completed work on truck to answer any questions or concerns between entities. _____
L. A pre-delivery meeting shall be conducted at the dump box vendor's facility at the **85% completion point prior** to truck being delivered to chassis vendor to ensure truck has met Racine County's expectations and specifications. _____

12. Miscellaneous

A. 25 ton trailer towing Pintle hook installed approximately 26¼" (center of hole) from floor and connections for trailer air, and electric brakes, at end of truck frame _____



SNOW PLOW AND PATROL WING WITH HITCH

1. **PLOW HITCH**
   a. Shall be Quick Coupling Push Hitch _____
   b. Hitch push channel shall be reinforced with a 5/8 x 4" steel plate across entire top of push pad contact area. _____

2. **TRUCK HITCH**
   a. Shall be Burke UBF (Universal Bumper to Frame) _____
   b. Plow hitch to be mounted as close to truck as possible. _____

3. **SNOW PLOW**
   A. Shall be a **12 FOOT BURKE ROAD TAMER 2000** **"NO Exceptions"**
      i. Moldboard face shall be constructed of 10 gauge steel. _____
      ii. Five (5) hinge points _____
      iii. Shall have rubber deflector installed _____
      iv. Winter Equipment Razor XL plow blades with left and right PlowGuard CurbRunner installed _____
      v. Left & right curb bumpers installed _____
      vi. Moldboard Height shall be 42". _____
      vii. Moldboard Length shall be 12'. _____
      viii. The moldboard is to be reinforced with no less than eight (8) one-piece vertical ribs, contour fit to the moldboard. _____
      ix. All ribs are to extend from the lower cutting edge reinforcement to the top edge of the moldboard. _____
      x. The center rib(s) shall have a lifting eye or rod located in a position that allows for a balanced lifting of moldboard and push frame. _____
      xi. The bottom of the moldboard shall be reinforced by a one-piece 5"x 3"x1/2" angle. This angle shall be reinforced by ten (10) ½-inch thick gussets. _____
      xii. This angle shall be punched with fourteen (14) 11/16" holes in standard highway punch configuration. _____
      xiii. The plow when attached to plow hitch shall be capable of level lift and being reversed to the right or left and maintaining a level height when fully angled. _____

4. **PATROL WING RIGHT SIDE**
   A. Shall be a **10' Burke Snow Patrol DKJ Patrol Wing** **"NO Exceptions"**
      i. 9' x ½" x 6" trip cutting edge. _____
      ii. Winter Equipment Razor XL plow blades with heel PlowGuard CurbRunner installed _____
      iii. Dual A-frame lift or equivalent if there is not a cable that lifts the wing toe. _____
      iv. Shall be equipped with a decelerating cylinder. _____
      v. Wing lock in hydraulics. _____
      vi. Full hood clearances with no side shift or tilt mechanism needed. _____
      vii. Shall have two (2) Whelen Wing WPLOW3AA warning lights installed on heel of wing. See picture for placement of lights. _____

HYDRAULIC TAILGATE SPREADER
(Henderson TGS or Swenson SBD-9 OR APPROVED EQUAL)

A. **AUGER & DRIVE**

1. Nine (9) inch auger and direct drive, **reversible**. _____

B. **GENERAL**

1. 304 Stainless steel unit. _____
2. Bottom opening for clean-out _____
3. Material shall dump to the left center of spreader, not at left end, and at right end for shouldering. _____
4. Left side 18" Poly Urethane Spinner _____
5. Motor mounted below spinner. _____
6. Dual flow control for spinner and auger motors _____
7. List gallon per minute range _____ - _____ GPM
8. Complete with hoses and quick couplers installed to rear of truck (see Sect. 9 of Hydraulic for hose type) _____
9. Trough and rear panel 7 gauge steel _____
10. Hydraulic safety interrupt disengages auger when either the cover or trough is opened. _____
11. Fully opening trough to clean out auger area. _____
12. Full height side plates to function as spill shield. _____
13. Provide one (1) repair parts manual. _____
14. Provide one (1) operators manual _____

PRE-WET SYSTEM

A. Liquid Pump:

1. Pump shall be constructed of a bronze corrosion resistant casting with special cast bronze gears. The pump shall have ½" NPT ports and shall include self-lubricating bearings. The pump shall be coupled to a hydraulic motor via a tooth and jaw style coupler and shall incorporate a stainless steel coupler guard that will also serve as a flow meter mount. This pump and motor combination shall be capable of producing **20 GPM.** The assembly shall be installed inside a weatherproof box mounted on liquid tank on passenger side of truck _____

2. Plumbing and Hardware:
   The system shall include a 1 ½" polypropylene quick fill port with Banjo brand shut off ball valve and integral camlock and cap mounted on the driver's side. The pump inlet plumbing shall include a Y-strainer with a serviceable screen filter cartridge. The bypass plumbing shall include a ¾"

polypropylene bypass valve with adjustable pressure relief and 60 PSI pressure gauge. All hose shall be nylon reinforced PVC hose with a working pressure of no less than 200 PSI. All fasteners shall be 316 stainless steel. _____

2. A ¾" Banjo disconnect fitting, with cap, to aid in spreader removal installed near hydraulic hoses at back of chassis. (See 6.F)
3. Ability to fully raise dump body without disconnecting any hoses. _____
4. All hoses and fittings shall be routed to protect from abrasion and wear_____

D. Discharge Nozzles:
   1. The spray system shall utilize three nozzles to apply solution on material being conveyed to spinner. The brass spray nozzles shall be mounted in brass nozzle bodies and the discharge line must include an inline check valve to prevent siphoning. _____

E. Liquid Tank
   1. Minimum 240-gallon polyethylene tank with stainless steel frame mounted on frame between cab and box _____
   2. A low level indicator and hydraulic pump shut down shall be connected to the Force 6100 system to warn operator. _____
   3. A second water connection on driver's side of bottom of tank with an electrically driven pump with a ¾ inch water hose connection and shut off valve. Switch to turn on and off pump to be located near water tank. Pump to be powered direct to battery.

F. Provide one (1) parts manual for each component of prewet system. _____

LIST ALL APPLICABLE WARRANTIES (attach copies)

1. Truck Chassis (includes cab, suspension, differential, electronics, etc.)

2. Engine

3. Turbo

4. Transmission

5. Engine Electronics

6. After treatment devices

7. Hydraulic System (includes Pump, Force America Controller, lines, hoses, etc)

8. Dump Body and hoist

9. Snow Plow, Wing, and Hitch

10. Pre-Wet System

WARRANTY WORK

- List location where warranty work shall be performed.
  _____

- Is pick-up and delivery of item a no cost item for warranty work performed at dealer's facility? Yes_____ No_____

- Will a fully equipped truck (i.e. the plow, wing(s) and salter installed on truck) be able to enter your facility without removing any item from truck (truck is approximately 13' wide). Yes_____ No_____

Wisconsin DOT GPS System

Install all associated Force America (only) required items to meet the Wisconsin Department of Transportation's AVL-GPS Program into truck. Contact Bob Braovac from Force America @ 1-262-513-2304 for more information. Please provide itemized list below for Wisconsin Department of Transportation's approval.

Description	Quantity	Cost
AVL-GPS Equipment & Installation		$
Plow Sensor		$
Pavement Temperature Sensor		$
Auger Sensor		$
Gate Sensor (as needed)		$
Flow Meter Sensor		**$**
Other:		**$**
Labor		**$**
TOTAL		**$**

Wisconsin Department of Transportation
Approval:

By: _____
Title: _____
Date: _____