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

Racine County
WISCONSIN

February 11, 2019

Dear Prospective Bidder:

You are invited to submit a bid to provide Racine County with One (1) New Current Model Year tandem 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 14, 2019 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 Duane McKinney, Purchasing Coordinator at (262) 636-3700 between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday or via electronic mail at duane.mckinney@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 # PW-1905

TANDEM 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 (1)
TANDEM AXLE DUMP TRUCKS
Bid # PW-1905

TRUCK VENDOR: _____

PRICE: - New Current Model Year Tandem Axle Dump Truck(s) with Snow Plow(s), Patrol Wing(s), AVL-GPS System(s) and Pre-Wet System(s). *** Quoted price includes delivery to and pickup from, any and all additional vendors and to Racine County Public Works when truck is completed. Racine County reserves the right to choose individual items between body equipment vendors, if necessary, to obtain pricing most advantageous for Racine County.**

PRICE: New Current Model Year Tandem Axle Dump Truck(s) that include:

Truck 1

TRUCK CHASSIS
Make/Model: _____ $_____ea.

DUMP BOX and HYDRAULICS
Vendor: _____
Make/Model: _____ $_____ea.

SNOW PLOW complete with HITCH:
Vendor: _____
Make/Model: _____ $_____ea.

RIGHT SIDE PATROL WING complete:
Vendor: _____
Make/Model: _____ $_____ea.

PRE-WET SYSTEM
Vendor: _____
Make/Model: _____ $_____ea.

HYDRAULIC TAILGATE SPEADER
Vendor: _____
Make/Model: _____ $_____ea.

WISCONSIN DOT GPS SYSTEM $_____ea.

Manufacturer Discount-Deduct $_____

TOTAL One Truck $_____

TRADE IN ALLOWANCES-Racine County Vehicle Numbers
#8 2001 Sterling LT9513 Tandem Axle Dump W/Plow, Wing,
Underbelly Scraper and V-Box Salter-Deduct $_____

****NET BID PRICE:**

This is a firm bid price complete as specified-ONE (1) TRUCK $_____

DELIVERY TIMES:

Truck Vendor delivery time from DATE OF PURCHASE ORDER: _____ (Approx. # of Days).

Installation of additional items on chassis PRIOR to delivery to Other vendors _____ (Approx. # of Days)

Installation of Plow and Wing: _____ (Approx. # of Days)

Installation of Hydraulics, Dump box, Prewet systems, AVL-GPS, etc.: _____ (Approx. # of Days)

Final preparation work by Truck Vendor: _____ (Approx. # of Days)

1. WISCONSIN DOT GPS SYSTEM
   A. Install PreCise IX-403 GPS system (**Racine County will provide the IX-403 silver boxes**) and 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 (as needed)		**$**
Other:		**$**
Labor		**$**
TOTAL		**$**

Wisconsin Department of Transportation

By: _____

Title: _____

Date: _____

TANDEM AXLE TRUCK

GENERAL

This specification is to describe a **tandem 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.** All attempts have been made to ensure the following specifications are as accurate as possible. Racine County is open to other options provided they meet the intent of this bid. Bidders will submit current literature for make and model bid.

List Model Bid: _____

1. TYPE

a. Tandem Axle Truck-Current Model Year _____
b. Usable CT: approximately 120 to accommodate specified dump body _____
c. GVWR: 66,000 lbs. minimum _____
d. Wheel Base: approximately 186 inches _____
e. Set back front axle model _____

2. AXLES, SUSPENSION AND EQUIPMENT

1. FRONT

a. 20,000 lb. minimum rating tapered springs with front shocks **Add an air suspension airbag with self-leveling valve or additional springs to right front spring to accommodate weight of wing PRIOR to chassis going to body builder.** _____
b. Front Tires – 425/65 R22.5 L rating _____
c. Front Rims: Two (2) 12.25 x 22.5 ISO steel disc wheels powder coated light grey _____
d. Seals- SKF Scotseal Plus XL or equal _____
e. Front Brake Dust Shields _____
f. Wheel cut: maximum allowed with specified wheel equipment _____ degrees.
g. Turning Radius: _____ft.
h. All wheels are to have steel hubs. Aluminum not acceptable. _____

2. REAR

a. 46,000# air suspension with dual leveling valves _____
b. Rear Chambers on forward side of drive axles _____
c. Rear Tires- 11R 22.5 H rating _____
d. Seals- SKF Scotseal Plus XL or equal _____
e. Rear Brake Dust Shields _____
f. Rear Rims: Eight (8) 8.25 x 22.5 ISO steel disc wheels powder coated light grey _____
g. All wheels are to have steel hubs. Aluminum not acceptable. _____

3. BRAKE SYSTEM

a. Full Air Brakes-S-Cam Type _____
b. Front: S-Cam 16 ½" x 6" _____
c. REAR-S-Cam 16 ½" x 7" _____
d. Low pressure warning system _____
e. ABS Brake System _____
f. Meritor automatic type slack adjusters _____
g. Wabco SS-1200 Plus Air Dryer with heater _____

h. Manual drain valves _____
i. Parking Brake-On both rear axles, spring set with dash mounted control _____

4. CAB EQUIPMENT

a. EXTERIOR

a. List construction of cab _____
b. Tilting fiberglass hood with butterfly inspection hatches _____
c. Rear cab window _____
d. Tinted and heated wiper blade area front windshield _____
e. Dual air horns, with shields, and a single electric horn _____
f. Heated West Coast Mirrors, RH & LH with stainless arms and brackets _____
g. Convex Mirrors - 8" mounted on lower arm of mirrors _____
h. Front heated hood mirrors _____
i. Clearance lights-standard configuration _____
j. Front fender flares or extensions _____
k. Electric windshield wiper motor with delay _____
l. Two-gallon windshield washer fluid tank _____
m. Standard factory installed head lights, high and low beam _____
n. Passenger side door lower door window with Fresnel lens _____
o. LH and RH grab handles _____
p. Nonremovable bug screen mounted behind grille _____
q. Winter front installed on grill _____
r. Cab and hood painted *Omaha Orange* _____

INTERIOR

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. 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 _____
c. Power windows _____
d. Passenger seat will be a fixed base and match driver seat _____
e. Arm rests for both right and left seats
f. Retractable seat belts on both driver and passenger seats _____
g. Assist handles installed on the inside of the right and left door _____
h. Four-Way flashers _____
i. PTO switch in cab dash _____
j. Gauges to include:
   (i) Air pressure gauge with light **and** 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 _____
k. Rubber floor covering _____
l. Driver side and passenger side rubber floor mats _____
m. Standard heater and defroster plumbing _____
n. Padded sun visors-right and left _____
o. Extreme climate thermal insulation _____

p. Air Conditioning _____
q. Tilt and telescoping steering column _____
r. Non-Leather Steering Wheel-approximately 18" _____
s. Radio-Factory installed AM/FM/WB _____
t. Turn signals-signal stat, self-canceling _____
u. Marker light switch with connections for plow lights. _____
v. Overhead console with a 2-Way Radio wiring accommodation package. Wiring must be at least **12ga** to accommodate a 40W radio _____

5. ELECTRICAL SYSTEM

a. 12-Volt System _____
b. Batteries: 12-volt, Group 31, 3375 CCA at zero degrees F _____
c. **Batteries located under passenger seat or a <u>fully enclosed battery box</u>** that will prevent road salt and debris from corroding terminals and located as such to allow access to batteries. _____
d. If battery box is not easily accessible area, i.e. under or in the cab, a jump stud must be provided on driver's side of vehicle _____
e. Rear lights combination, stop, tail, directional, and back-up to be between frame rails. _____
f. Shall have circuit breakers in lieu of fuses _____
g. Shall have auxiliary harness for front headlights and turn signals for front plow lights _____

6. ENGINE

a. Diesel-400 HP minimum @ 1625 RPM _____
b. Torque-1650 ft. lb. minimum @ 975 RPM _____
c. Specify make, model, CID, and HP @ rated RPM

_____

d. Alternator-Delcotron, 160 AMP 28-SI, brushless _____
e. Air Compressor-16 CFM minimum _____
f. Air intake-inside/outside with in cab control _____
g. Air to air after cooling _____
h. Engine hoses and tubing-Silicone _____
i. Air operated on/off fan clutch _____
j. Heated thermostatically controlled fuel/water separator _____
k. All daily under-hood checks on drivers' side of engine _____
l. Oil filter is engine mounted-disposable _____
m. Delco 12V 39MT+HD/OCP, or equivalent, starter with thermal protection & integrated magnetic switch _____
n. Coolant protection to minus 34F (-34F) degrees _____
o. Exhaust: Vertical Stack configuration designed as not to interfere with mounting of the dump box, hydraulic tank, and controls. All flex tubing must be stainless steel. _____
p. Stainless steel covers for after treatment devices _____
q. 5yr., 100,000-mile warranty on the engine, injectors, turbo, after-treatment & water pump _____
r. Engine to be supplied with a fuel primer pump _____
s. Stainless steel oil pan _____

7. CHASSIS

a. .4"x 3-1/2" x 11-1/4" single channel steel frame, 120,000KSI _____

b. Front frame extension must be part of parent rail continuous of main frame (integral) _____
c. 20" integral front frame extension or adequate for plow mount installation. Not less than 14 inches from grill. _____
d. 14" extension beyond rear of rear tires to accommodate dump box specified by bodybuilder. _____
e. Tow hooks, front and rear _____
f. Fuel Tank-Aluminum Left hand 70-gallon step tank with non-skid tread and stainless-steel hold down straps _____

8. DIFFERENTIAL

a. Meritor Differential _____
b. Differential to be geared for 65 mph with specified tires _____
c. No spin rear axles _____
d. Inter-axle differential and lock out with dash-mounted control _____
e. Synthetic gear oil _____
f. Have protection from dissimilar metal corrosion between wheels and wheels to hubs _____

a. TRANSMISSION

a. Automatic Allison 4000 RDS _____
b. Synthetic Transmission Oil "TranSynd TES-295" _____
c. On dash Push Button Shifting _____
d. Transmission Cooler _____
e. Close ratio six (6) speed _____
f. Prognostics Enabled _____
g. 5-year warranty covering entire transmission including electronics _____
h. Vehicle interface wiring with body builder connector mounted inside back of cab _____

b. MISCELLANEOUS

1. Provide a laptop computer with all software, and one year of internet access as required, to access **ALL** vehicle diagnostics and parameter settings (includes the engine, Allison "DOC" transmission software, antilock brakes, body building, Force America and multiplexing electronic system(s)) installed. Include all hardware, connectors, etc. needed to connect software computer to truck. _____
2. Included on computer will be
   i. Parts Manuals for Engine, Transmission, and ABS brake system
   ii. Engine Repair Manual
   iii. Shop Service Manual
   iv. Electrical Service Manual with Schematics
   v. Emission Service Manual
   vi. Service Bulletin with Updates _____
3. 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 later (i.e. when truck is serviced) that were not delivered will still be the responsibility of vendor to provide at such date.
   Initial: _____
4. Three ignition keys provided. _____
5. Vendor shall provide onsite instruction for two (2) people for servicing of major components such as engine, ABS, emissions etc. _____
5. Lubecore automatic grease system for chassis, wing, & dump box. _____

6. Will warranty/repair work be able to be performed on the tandem axle vehicle without removing any attachments (i.e. wing plow)?
   Yes_____ No_____

HYDRAULICS FOR TANDEM AXLE TRUCK

"HYDRAULICS SHALL BE FORCE AMERICA'S WITH **NO EXCEPTIONS".**

1. POWER TAKE OFF:

The power take off (PTO) shall be mounted to the Allison 4000RDS transmission. The PTO shall be a hotshift type. The PTO shall be designed to clear the integrated cooler on the Allison transmission. It shall mount like a standard side mounted PTO with an additional bracket at the rear of the transmission. The output of the PTO shall be extended past the back of the transmission where there is extra space. The main extension shaft and PTO shall be one piece to eliminate the need for input splines between the PTO and extension shaft. The clutch pack shall be located at the back of the transmission in the extension shaft. The input between the extension shaft and the pump shall be a wet spline. The PTO shall be a **Parker Chelsea 890 series** or approved equal.

2. HYDRAULIC PUMP:

The hydraulic pump shall be an axial piston pressure and flow compensated load-sensing type. The pump shall have a displacement of 5.61 cubic inches per revolution at maximum stroke which will deliver 23.7 GPM @ 1000 engine RPM. The pump shall have a minimum 2" inch suction line and ½" control drain line plumbed directly back to the reservoir. The pumps compensator shall have rear facing adjustments. The pump shall be rated for 5800 PSI maximum and 4800 PSI continuous. The pump shall have a Din type-mounting flange and a Din 5462 8-tooth shaft. The pump shall be **FORCE America TXV92** or prior approved equal.

3. 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.

4. 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 indicator’s 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.

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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.

Unit to be supplied with:
***a. PreCise® MRM Temperature Sensor to integrate and display on*-screen** _____
b. Cameras installed facing the dump body, wing and rear of truck. Cameras are to also be displayed on screen _____

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

5. 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**.

6. VALVE CONTROLS

a. Dual axis on/off plow control _____
b. Dual axis on/off wing control _____
c. Proportional dump body with center safety lock _____
d. The valve controls must be tested before delivery _____

7. HYDRAULIC RESERVOIR/ VALVE ENCLOSURE

The valve/tank assembly shall be a **FORCE America model "VT35G2-B-SP Valve/Tank Assembly"** or prior approved equal. _____

a. The hydraulic reservoir will be of 35 gallons nominal capacity.
b. The hydraulic reservoir will be constructed of 10-gauge 201 stainless steel with a 2B finish and be internally baffled.
c. The valve enclosure lid will protect from both road and pressure washer spray.
d. For ease of removal by a single person, the valve enclosure lid shall weigh less than 22 lbs.
e. The valve enclosure lid shall be black high-density polyethylene with stainless steel reinforcements.
f. The valve enclosure lid shall have molded integrated handle for ease of removal.
g. The valve enclosure lid shall be attached to the reservoir via (4) rubber straps that can be removed without the use of any tools.
h. Mounting bracket is to be designed and supplied by the reservoir supplier.
i. Mounting system should allow for a 1" frame clearance for frame obstructions.
j. Shall be mounted in a manner as to not transmit any truck torsional loads thru the tank.
k. The enclosure will use a gasket-less passive technology. (No rubber seals, gaskets, or weather stripping.)
l. The enclosure lid will be removable within seconds by one person without the use of tools.

m. All valve fittings, hose ends, filter, filler breather, sending units and any electrical connections are to be protected by enclosure cover.
n. The reservoir supplier will provide all valve fittings (JIC connections) and plumb the return line from the valve to the filter.
o. The cover will protect from both road and pressure washer spray.
p. The use of bulkhead fittings is not permitted.
q. The directional control valve must be easily accessible from all (6) sides without the use of tools.
r. Hose exit and entrance must allow for components to be mounted adjacent to the enclosure.
s. A 2" full flow brass ball valve shall be plumbed at the suction port of the tank.
t. A low oil/high temp sending unit shall be mounted in the reservoir.
u. Hydraulic oil shall be equivalent to Service Pro AW 32 with **blue dye added**.

6. Force America Add-A-Fold control valve (no Exceptions)

The hydraulic valve shall be of modular manifold design. Valves requiring the removal of tie rods and disassembly of valve to service a work spool section will not be accepted. 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 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 12VDC and require a maximum of 1400 milliamps. Each segment shall be equipped with a manual override except for the auger, spinner, & pre-wet 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 downside relief to protect the body down function. This relief shall be set to the hoist manufacturer's specifications. Valve segments shall be Add-A-Fold model. 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
Right Wing toe	3-way with lock valve to prevent drift down
Right Wing Heel	4-way with 1500-psi (A) port relief valve
Auger	4-way
Spinner	2-way
Liquid/Prewet	2-way

Please note: The wing heel sections shall be equipped with hydraulic wing locks plumbed to the cylinders to prevent wing drift down.

Hydraulic valves, electrical components, and electrical connections shall be mounted in a weather-tight enclosure that will protect from both road and pressure washer spray.

8. CONTROL VALVE KICK-OUT

a. The body hoist cylinder shall be connected to control valve and provided with kick-out to prevent over extending the cylinder.
b. A 904S-C-16 cable pull off valve plumbed between the valve and cylinder.

7. 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 to have a minimum SAE 100-R2 rating. Return lines and case drain shall have minimum SAE 100-R1 rating. _____

b. Hydraulic lines shall be routed away from exhaust manifolds pipes, bolts, sharp edges, and exhaust system 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. All hydraulic hoses shall be Gates Global M3K Mega3000 MegaTuff Hose with a minimum working pressure of 3000 lbs. psi and bursting pressure of 13,000 lbs. _____

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

e. ½" (minimum) stainless steel tubing will be routed from front to rear of chassis with minimal interference as possible with equipment and chassis components that require periodic servicing. 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 24 in. _____

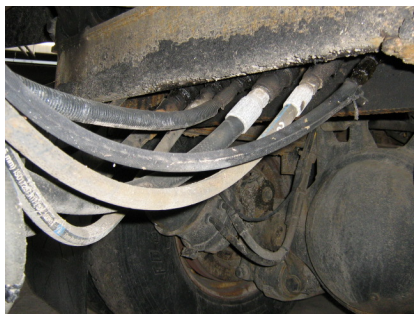
f. A return line manifold to be used to minimize the length of return lines to hydraulic tank. _____

g. 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. _____

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

i. 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. _____

j. **All hydraulic quick couplers shall be mounted to the rear of the chassis.** _____



8. MANUALS PER UNIT

a. One (1) parts manual must be supplied for each accessory listed 1-9 above. _____

DUMPBODY FOR TANDEM AXLE TRUCK

1. GENERAL

(i) This specification is to describe a 201 stainless steel **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.

Model Bid: _____

2. DIMENSIONS

(All dimensions are approximate. Please contact chassis dealer prior to ordering to ensure correct dimensions)

a. Length: 14 ft. 0 in. inside at floor. 15' 6" overall _____ft._____in.
b. Width: 84 inches inside. _____ft._____in.
c. Capacity: 13.5 - 17 cu. Yd. _____ cu. yd.
d. Straight sides: 44 inches high _____in.
e. Headsheet height: 60 inches. _____in.
f. Tailgate height: 52" inches high _____in.
g. Distance between cab and box **NOT** to exceed 5 inches _____

3. SIDES AND HEADSHEET

a. One piece 7-gauge sides and front head sheet _____
b. 10 ga. 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. Vibrator mounted and controlled from inside cab _____
g. Rear body design is to be asphalt body, sloped tailgate style _____

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. Tailgate pins should be mounted as low as possible at bottom of gate to allow gate to "lay flat" when open. _____
f. Air operated tailgate latch _____
g. Latch hooks and latch plates made from stainless steel _____
h. **A "tailgate open" light shall be mounted in the dash** _____
i. Shall have grease zerks at all pivot pins _____

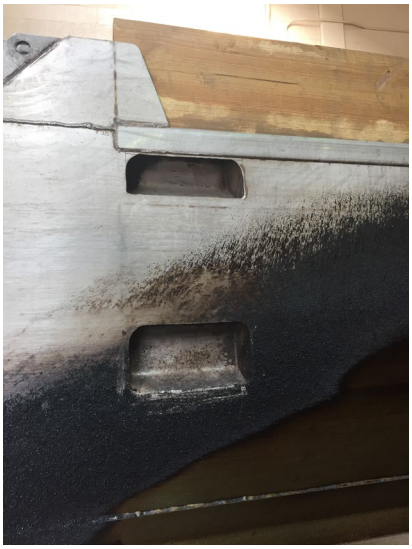
6. HOIST AND FRAME

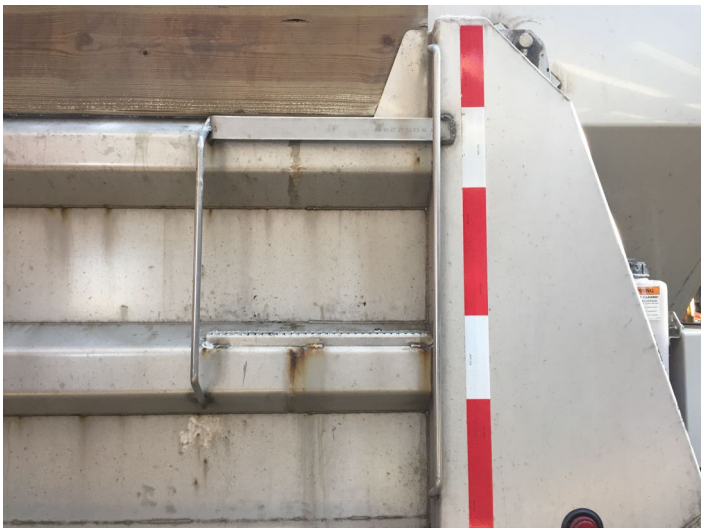
a. 8-inch I-beam frame. _____
b. Double acting hoist _____
c. Nitride piston rod _____

d. Trunnion mount cylinder _____
e. Minimum rating - 37 ton _____ Ton
f. Shall have grease zerks at all pivot pins. _____
g. Shall Include all OSHA approved equipment and labeling. _____
h. Body up light switch in Force 6100 _____

7. GENERAL

a. Rear step plates above rear wheels inside **and** out of box to allow access into and out of box. _____





b. Stainless steel walking rail along both sides of body _____
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. Body-up warning light located in the cab _____
e. Left and right dump grab handles _____
f. Roll-Rite (only) brand asphalt tarp electrically controlled from cab _____
g. Mud flaps mounted on rear of chassis with removable brackets _____
h. Must conform to all Federal and State regulations. _____
i. Rust Proofing on the following:
   Entire underside of dump body floor _____
   Truck Chassis _____
j. No rust proof holes in dump body or truck chassis. _____
k. Two (2) OSHA approved body props _____
l. All mounting fasteners attached to dump body and salter are to be stainless steel. _____
m. Any material not stainless steel will be painted black and rustproofed. _____
n. Electronic backup alarm 112db _____

8. DUMPBODY TAIL LIGHTS

a. Tail lights shall be Truck-Lite 60050R lights 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 _____

9. DUMPBODY WARNING LIGHTS

a. Shall be Star Warning Systems DLXTHU-8BA 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. _____

10. 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. _____

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 between driving lights and plow lights. _____

d. Plow lights shall be properly aligned for night time driving. _____

11. 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 the 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. _____

12. MISCELLANEOUS

a. A pre-build meeting shall be conducted at dump box vendor's facility prior to work commencing on truck to answer any questions or concerns between entities. _____

b. 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 the truck has met Racine County's expectations and specifications. _____

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. _____

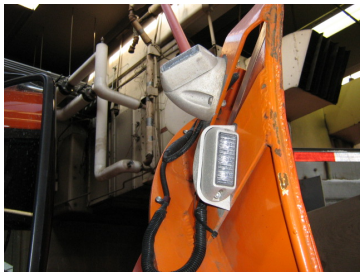
3. SNOW PLOW

a. Shall be a **12 FOOT BURKE ROAD TAMER 2000** **"NO Exceptions"**
   (i) The moldboard shall be broke not rolled. _____
   (ii) Moldboard face shall be constructed of 10-gauge steel. _____
   (iii) Five (5) hinge points _____
   (iv) Shall have rubber deflector installed _____
   (v) Winter Equipment Razor XL plow blades with left and right PlowGuard CurbRunner installed _____
   (vi) Moldboard Height shall be 42". _____
   (vii) The moldboard is to be reinforced with no less than eight (8) one-piece vertical ribs, contour fit to the moldboard. _____
   (viii) All ribs are to extend from the lower cutting edge reinforcement to the top edge of the moldboard. _____
   (ix) 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. _____
   (x) 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. _____
   (xi) This angle shall be punched with fourteen (14) 11/16" holes in standard highway punch configuration. _____
   (xii) 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"**

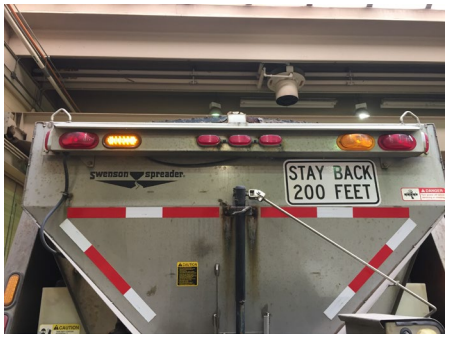
i. 9' x ½" x 6" trip cutting edge. _____
ii. Winter Equipment Razor XL plow blades with heel PlowGuard CurbRunner installed _____
iii. Dual A-frame lift, (No Cable). _____
iv. 4" x 10" Lift cylinder-nitrided _____
v. 3 ½" x 10" Toe cylinder _____
vi. 4" x 19" Heel cylinder. _____
vii. All cylinders to have 2" nitrided rods. _____
viii. Shall be equipped with a decelerating cylinder. _____
ix. Wing lock in hydraulics. _____
x. Full hood clearances with no side shift or tilt mechanism needed. _____
xi. Shall have two (2) Whelen Wing WPLOW3AA warning lights installed on heel of wing. _____



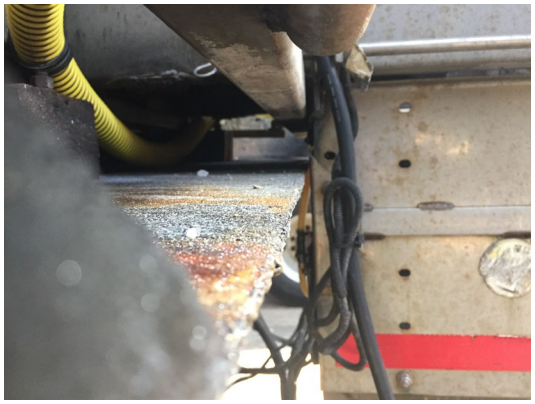
Note: ***All mounted framing and hardware for plow/wing(s) shall be painted black and rustproofed.***

ONE (1) V-BOX MATERIAL SPREADER WITH A HYDRAULIC LIQUID SPRAY SYSTEM
"V-Box and all associated metal shall be stainless steel"

1. **General**
   a. Shall be designed to fit inside proposed dump body. _____
   b. Model: _____
   c. Minimum 11.8 cubic yard capacity. _____
   d. Shall be equipped with a Buyers Products Company lightbar (P/N LB8665SST) or equivalent, with Star Warning Systems DLHTHU-8-R lights and DLXTHU-8-A strobes installed. Lights should be wired same as Section 9.a _____

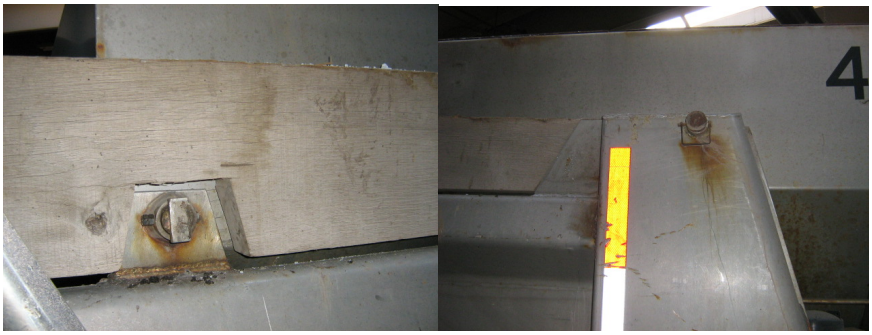


   e. Side Height 68 inches. _____
   f. The salter must be installed as far forward into the dump box as possble.



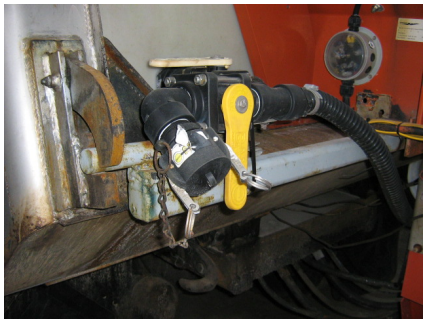
2. **Body**
   a. 12 gauge stainless steel sides _____
   b. 7 gauge floor _____
   c. 304 stainless or equal _____
   d. 5 side supports and properly sized bracing to fit in dump body _____
   e. Reinforced top screens hinged to longitudinal channel _____
   f. Seven-inch (7") auger _____
   g. Grease manifold installed to lubricate front auger bearing _____
   h. Slip in mounting kit to safely secure the hopper to the dump box, shall be included using a combination of four (4) 1 1/4" diameter stainless steel rods of sufficient length installed:
      i. Through upper tailgate pivot point and into sides of spreader
      ii. Through a 5 ½" (bottom) by 3 ½" (top) by ¾" (thick) trapezoidal shaped stainless steel bracket welded to the top of dump box as close as practical to the front edge of the spreader. **Must**

be able to install side boards after installation. _____



Front Rear

i. Tailgate latch kit will be used for additional support in securing the V-box spreader into the dump body. 2" thick wall square tubing of sufficient length to reach the tailgate latches will be installed along with 1" x 10" shafting. _____



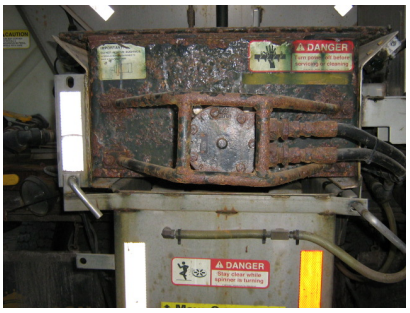
3. Auger System

a. Shall be 7" in diameter running longitudinally with the body, feeding material the full length of the hopper. The auger shall consist of a 4" pipe with a 2" cold roll end shaft and flitting continuously welded the full length. The auger trough shall be removable and manufactured of 7-gauge steel. The auger shall be driven by an 18 H.P. hydraulic motor directly coupled by a splined shaft coupling. The coupling shall be equipped with grease fitting so that the motor spline and coupling can be lubricated. The idler end of the auger shall be supported by a 4-bolt flange, heavy-duty dust sealed, self-aligning ball bearing. This bearing must be able to be lubricated from outside of the dump body. Both the auger drive and idler end plate shall be manufactured from 3/8" steel. An adjustable in height inverted vee shall be provided to keep the material load off the auger for easier auger start-up. _____

b. The inverted vee shall be adjustable in height and located approximately 8" - 10" above the V-box sides. The inverted vee manufactured of 10-gauge stainless steel and 3/16" x 1 ½" x 1 ½" angle iron. The entire assembly shall bolt to the inside supports welded above the outside side supports. _____

c. A protective grid shield shall be placed over the exposed auger outside the hopper. _____

d. A metal protective shield shall be installed around hydraulic motor. _____



4. Spinner

a.) The entire spinner assembly will be capable of repositioning vertically without the use of special tools to allow the unloading from the conveyor without interference from the spinner assembly. This assembly shall be capable of being secured in a horizontal position without the use of tools. _____

b.) 18" diameter minimum tip-up type material chute. _____

c.) Spreader pattern shall be capable of spreading material in an even pattern to both left and right of the truck. _____

d.) Spinner height shall be approximately 20" above ground level when placed on a dump body with a floor height of approximately 54". _____

e.) The spinner disc shall be driven by an independent low speed high-torque "orbital type" hydraulic motor. _____

5. Miscellaneous

A Spreader shall have the hydraulic capacity required to operate with truck hydraulics. _____

B Hydraulic hoses required to couple to truck. _____

C Body up light in dash. _____

D Natural Stainless Steel Finish _____

E The following manuals will be supplied upon delivery of truck:

1. Parts manual _____
2. Service manual _____
3. Operators manual. _____

6. Pre-Wet System

A Shall be equipped with Varitech or Henderson Hydraulic Liquid Spray System, with two (2) **400**-gallon min. polyethylene molded reservoirs. _____

B Pre-Wet system shall come complete with a liquid spray pump capable of discharging up to **28 gallons per ton** of material, sprayer tanks, tank-mounting straps, discharge nozzle bar, closed loop flow meter, plumbing, and hardware. _____

C Pre-Wet system must be compatible to operate with Force America's CommandAll 6100 hydraulics and control center. _____

D Pre-Wet tanks shall be fully removable. _____

E 1 ½" Fill valve with cover at lower point on tank (see picture in Section 3.c above) _____

F Fill line between tanks shall be 1 ½" _____

G Stainless steel hold-downs _____

WARRANTIES
Bid # PW-1905

TANDEM AXLE DUMP TRUCK

LIST ALL APPLICABLE WARRANTIES (attach copies as necessary)

1. **Truck Chassis/Engine**
Please detail:

Additional Warranties Available

	Months	Miles	Provider	Cost
Engine:	_____	_____	_____	_____
Transmission:	_____	_____	_____	_____
Turbo:	_____	_____	_____	_____
Injectors:	_____	_____	_____	_____
Frame:	_____	_____	_____	_____
Front Axle:	_____	_____	_____	_____
Rear Axle:	_____	_____	_____	_____
ABS Brake:	_____	_____	_____	_____
Chassis Electronics:	_____	_____	_____	_____
Chassis Wiring:	_____	_____	_____	_____

2. Hydraulic System (CommandAll)
Please detail:

3. Dump Body
Please detail:

4. Snow Plow, Wing, and Hitch
Please detail:

5. Pre-wet System
Please detail:

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** _____