

# **NELSON COUNTY FISCAL COURT**

*Specifications # 2018-NC-011*  
**FOR**

**Tandem Axle Dump Trucks- 56,000 LB**

### ***Request for Bids***

Nelson Fiscal Court will accept sealed bids for one new Tandem Dump Trucks , 56,000 LB GVW class. Bid specifications can be picked up at the Nelson County Road Department Office at 820 West Stephen Foster, Bardstown, Kentucky 40004 (or by contacting 502-348-1881)

Sealed Bids shall be submitted by and will be opened at 10:00 A.M., local time, on February 8, 2019 in the Nelson County Fiscal Court Room located at the old Nelson County Courthouse, One Court Square in Bardstown, Ky.

The County reserves the right to reject any or all bids and waive formalities.

Dean Watts  
Nelson County Judge Executive

Nelson County Fiscal Court  
**OFFICIAL BID FORM**

**NEW** Tandem Dump Truck (56,000 LB GVW) -  
per attached ***SPECIFICATION #2018-NC-011***

The County reserves the right to reject any or all bids and waive formalities.

Bid Option # 1) Bid for New Tandem Chassis Cab (56,000lb GVW)

\$ \_\_\_\_\_

Bid Option # 2- Dump Body with Central Hydraulic /System

\$ \_\_\_\_\_

Bid Option # 3 Paint - Chassis only-

\$ \_\_\_\_\_

Color-Light Grey=Sherwin Williams Color # 42082

Delivery time from date of order: \_\_\_\_\_

Warranty: Per Specification \_\_\_\_\_

***The undersigned, authorized representative of \_\_\_\_\_ does/do***

***hereby submit the above bid to the Nelson County Fiscal Court  
this \_\_\_\_\_ day of \_\_\_\_\_, 2019 and certify model  
bid complies with the specifications unless noted otherwise.***

\_\_\_\_\_  
***Bidder's Authorized Representative***

NOTE: All exceptions to the specification shall be noted by the bidder.  
Nelson County reserves the right to accept or reject all bids and waive formalities  
Bids provided shall be valid for at least sixty (60) days after bid opening.  
Price includes parts and maintenance manuals for tandem dump truck.

**NELSON COUNTY FISCAL COURT**  
**SPECIFICATION # 2018-NC-011**

**ITEM 1 – CHASSIS CAB, TANDEM-AXLE , 56000 LB GVW**

It is the intent of these specifications to describe a truck to be used on the highway system of Kentucky for utility hauling, and snow and ice removal operations. The vendor will be required to supply and install all of the components for the central hydraulic system and the dump body on the truck chassis as further described in these specifications. The snowplow and chemical spreader mentioned herein are not intended to be part of this contract.

**PAINT:**

All units covered by this specification shall be factory painted the manufacturer's standard production WHITE, lead-free acrylic enamel equal to DuPont #LF-508. The dump bodies on all of the trucks shall be painted with BLACK, lead-free paint.

\*\*\* See Bid Option # 3 for Alternate Color

**FACTORY WARRANTY:**

Widespread failure by a manufacturer's authorized dealer to render warranty service when properly presented, shall subject manufacturer's line to suspension from approved products list until satisfactory evidence of correction is presented. The warranty table shown shall be the minimum warranty provided.

Total Vehicle*	3 Years**/100,000 Miles	100% Parts & Labor
Engine	7 Years/150,000 Miles	100% Parts & Labor
Transmission	5 Years/Unlimited Miles	100% Parts & Labor
Drive train	3 Years/100,000 Miles	100% Parts & Labor
Cab (Structural & Corrosion)	3 Years/300,000 Miles	100% Parts & Labor
After Treatment System	7 Years/150,000 Miles	100% Parts & Labor

**Note:** Except otherwise shown, coverage does not include normal, or expected "wear and tear", such as tire tread wear, etc. Engine warranty shall cover all internal components, major engine systems and all major components also including, but not limited to; Cylinder Head Assembly, Rocker Lever Assembly, ECM, Piston, Rings, Liners, Lube Oil Cooler Assembly, Front Gear Cover, Oil Pan, Connecting Rod Assembly, Lube Pump Assembly, Camshaft (Bushings), Cam Follower Assemblies, Crank Shaft Assemblies, EGR Cooler (Valve and Mixer), Fuel Injectors, Turbo/s, and Water Pump.

**Note:** All Warranties shall have an active date starting from when unit is placed in service from date of delivery and acceptance of complete units. A warranty certificate shall be provided. All warranty service shall be provided by authorized provider/s within the Commonwealth of Kentucky

### **EXCEPTIONS TO SPECIFICATIONS:**

Any variation from the requirements of this specification and/or specifications made part of the bid invitation must be listed on a separate sheet and attached to the bid. Failure on the part of the bidder to comply with any and all requirements and conditions of this specification may subject his bid to rejection. If no exceptions or deviations are shown, the bidder will be required to furnish materials exactly as specified. The burden of proof of compliance with this specification will be the responsibility of the vendor.

### **SPECIFICATIONS: MEDIUM DUTY, CLASS 8 TRUCK:**

**GVW PLATE RATING:** 56,000 lbs. MINIMUM, chassis cab-to- center axle (CT) = 120" Clear, wheelbase (WB) = 176" (approximate dimensions).

**DETAILED SPECIFICATIONS:** All vehicles furnished under this specification shall conform to the Federal Motor Vehicle Safety Standards applicable at time of delivery and shall be equipped as herein specified plus any additional equipment listed as standard by the manufacturer for models approved.

#### **A. ENGINE:**

1. The minimum engine shall be 2010 EPA Compliant, Turbocharged liquid cooled, 4-cycle, 6-cylinder diesel engine. Cummins L9 350 HP, 1,000-Ft-Lb torque sleeved diesel engine or pre-approved equal. International Engines not permitted for this bid.
2. Heated fuel filter with water separator.
3. Vertical exhaust with tailpipe guard with protector shield and 90 degree elbow discharge preferred on curbside. Muffler shall be horizontal or vertical. If a vertical muffler is bid, it shall not extend beyond the back of the cab by more than 4". This is required due to dump body installation restrictions.
4. Cold Weather Starting Aid: Electric block heater, 1,000 watts minimum, 115-120 volt AC, shall be installed in the engine block and provided with weather proof connector.
5. Engine Coolant shall be long-life coolant/antifreeze having a drain refill life of at least four (4) years or 300,000 miles.
6. Air Cleaner: Dry type heavy-duty with an in-cab restriction gauge. **NOTE:** Air intake shall be specifically located to avoid snow and ice uptake during winter snow removal operations. (This will require installation of an Aluminum or Stainless Steel **deflector**, if intake is on passenger's side of cab).
7. The electronic engine control shall be utilized to limit the maximum on highway speed of the vehicle to 70 mph.
8. Engine Idle Shutdown Setting, 15 Minutes.
9. Shall be equipped with a cab controlled minimum two (2) or three (3) stage exhaust brake. When engine brake is activated, brake lights shall illuminate.

**B. AUTOMATIC TRANSMISSION:**

1. Unit shall be equivalent to an Allison RDS-3000 6-Speed Automatic Transmission, or as recommended by engine manufacturer. Shall be equipped with an Auto-Neutral Feature (Ensuring transmission is placed in a neutral setting when parking brake is applied), Auxiliary Hold and Load-Based Shift Scheduling (Optimizing fuel economy and performance).
2. Provisions shall be made for the PTO to be mounted on the transmission with a clutch pack system.

**C. AXLES AND SPRINGS:**

1. Front axle - 16,000 lb. front axle.
2. Front shock absorbers required.
3. Rear axle - Minimum 40,000 lb. rated capacity, tandem drive, single reduction Meritor RT-40-145P, or equal, with 4.33 ratio and in-cab controlled traction differential-both rear axles (inter-axle and inter-wheel lock-outs; all rear wheels engage and pull)
4. Heavy-duty front and rear springs as required for axle capacities specified. The rear suspension shall be of the spring and beam type, Hendrickson Model RTE-400, or equal, with BRONZE bushings.
5. Stemco wheel seals, or equal, wet type, front and rear.

**D. STEERING:**

1. Hydraulic power steering, 16,000-lb. steering gear (equal to Sheppard M110, TRW TAS-85).

**E. FRAME:**

1. Shall be full-length double "C" channel or inverted "L" reinforcement construction and shall be rated 2,500,000 RBM minimum.
2. Unit shall be equipped with an integral front frame extension same size as frame rails to enclose the front-mounted hydraulic pump and to support a snowplow. The integral front extension shall have additional front support added with a min. 3/8" steel angle bolted between the frame rails to support the hydraulic pump for the central hydraulic system as further described herein (shall be equipped with a factory installed Front Crankshaft Adapter to power a Tubular Drive Line for the Hydraulic Pump).

**F. CAB EQUIPMENT:**

1. Power Windows and Locks, Both Doors.
2. Tilt Steering.
3. Tilting type hood and fenders with stationary front grill.
4. Dual Sun Visors.
5. Arm Rest, Both Doors.
6. Powered Auxiliary 12v Outlet.
7. Air Horn, Located Above Cab.

8. Dual windshield wipers, cowl-mounted electric, 2 speed, with intermittent mode and windshield washer system.
9. Radio - factory installed manufacturer's standard AM/FM.
10. Factory installed 2-Way radio lead, dash top center located with bracket and 15-amp fused supplied lead. (Ignition hot only)
11. Temperature controlled fresh air heater and defroster.
12. Factory Installed Air Conditioning.
13. Grab handles, both sides of cab, located inside and/or outside of cab.
14. Power (Motorized) West Coast type outside (HEATED) mirrors, both sides, 16" x 6" (minimum) and shall include an 8" "spot" mirror for added visibility, on each side. Outer top passenger door shall be equipped with a down view mirror. (Mirrors shall be corrosion resistant).
15. LED Cab clearance lights, amber (5 each).
16. Dome Light.
17. Glove Box and/or Door Pockets.
18. Vinyl Seats and Interior.
19. Seats - National Cush-N-Aire type or equal, high-back air suspension driver seat, and fixed base passenger seat, complete with required seat belts.
20. Tachometer, Dash Mounted.
21. Engine coolant temperature, oil and air pressure gauges.
22. Ammeter or Voltmeter
23. Hour meter
24. Cab insulation - Cab roof, as a minimum, shall be double wall with headliner, or shall have at least 1/2" of insulation and headliner with single roof.
25. Rear window - tempered safety glass (non-opening).
26. **Dash mounted label stating" Maximum Trailer Towing Capacity = 15 Tons". This label shall be large enough for easy reading by the driver.**
27. Positional telescoping Tilt Steering.
28. Remote chassis module shall be located in the cab.

#### **G. SERVICE BRAKES:**

1. Brakes, service - Shall meet requirements of FMVSS121 and any mandatory federal requirements regarding Anti-lock Braking System (ABS). Units shall have air brakes, front/rear (both tandem axles) cam type, with automatic slack adjusters, and automatic moisture ejectors. Units shall also have dust shields. NOTE: Tandem brake chambers shall be inverted for additional road surface clearance.
2. Air compressor 18.7 CFM.
3. Low pressure warning buzzer.
4. Heated Air Dryer, Bendix or equal.
5. Automatic slack adjusters and dust shields.
6. Large capacity air storage tank 2,500 cu. in.
7. Parking brake - Spring set rear axle type brake.
8. Trailer brake air - air brake system extension to rear of truck frame. To be complete with SAE-J318 gladhand couplers and covers equal to Midland model 11445 or equivalent, all necessary valves, controls and plumbing to make

complete and workable system for towing a trailer with air brakes. Gladhand couplers shall be located as high in the rear crossmember as possible, without interfering with operation of the dump body or salt spreader when installed.

**H. FRONT BUMPER:** swept back, steel.

**I. PINTLE HOOK:** rear - 6,000 lbs. vertical, and 50,000 lbs. trailer pull, swivel type, spring mounted in 1/2" channel, equal to Wallace Forge T-25, and with two (2) - 1" drop forged "D" rings. Channel reinforced "A" frame bracing. Height of pintle, from ground surface to the bottom of the saddle, shall not exceed 28 inches.

**J. TOW HOOKS:** Two (2) tow hooks are to be supplied with each unit. These hooks are not to be mounted on the chassis. Transportation Cabinet Personnel will install these hooks in conjunction with installation of snowplow bracket after units are received. The tow hooks shall include one (1) right and one (1) left hand hook equal to Holland model TH1255R and TH1255L.

**K. FUEL TANK:** Minimum one hundred (100) gallon, aluminum fuel tank and stainless steel straps rail mounted below the driver's door including driver and passenger side aluminum self-cleaning non-slip steps. Painted steel will not be acceptable.

**L. DIESEL EXHAUST FLUID (DEF) TANK:** Unit shall be equipped with a minimum nine- (9) gallon DEF tank and protected aluminum/stainless steel surround.

**M. TIRES and WHEELS:**

1. Front tires - shall be tubeless radial 315/80R22.5 (PR18), premium steer tires, with a (maximum MPH) rating of 70MPH or greater, mounted on 22.5 x 8.25 ISO 10 hole steel disc wheels.
2. Rear tires - shall be tubeless radial, mud and snow tread, 11R22.5 load range G (PR14) premium drive position tires, with a (maximum MPH) rating of 70MPH or greater, mounted on 22.5 x 8.25 ISO 10-hole steel disc.

**M. MUD FLAPS:** Shall be installed fore and aft of rear wheels. The fore flaps shall be fixed sheet metal with 4" wide rubber strip at bottom. Rear mud flaps to be plain rubber, non-embossed.

**N. TOOL BOX:** An aluminum or stainless steel weather tight, lockable tool box shall be installed on the outside of the frame rail of the chassis between the rear wheels and the cab. This tool box shall include the following minimum features:

1. Minimum capacity = 3.0 cubic feet.
2. Shell of box to be minimum .125 treadbrite aluminum or 304 stainless steel.
3. Door to be double pane 20-gauge minimum.
4. Door to have hat channel reinforcement.
5. Automotive door seal to be used for sealing of door.
6. Locking handle to be stainless steel and riveted on for ease of replacement.



**O. ELECTRICAL:**

1. Two (2) 12 volt batteries, maintenance free, with a total combined capacity of 1850 CCA minimum, with remote jump start terminal(s) with direct ground cable to starter, cable end attachment to terminal post shall be covered by a rubber boot filled with dielectric grease to protect from corrosion from de-icing materials (The remote terminals are to be insulated from metal contact by use of rubber grommet or equal method). Shall be covered with a weather tight corrosion resistant cover (This may not be a factory installed option, and may require to be provided as an aftermarket item).
2. Alternator 160 amp minimum.
3. Shall be equipped with breakers in lieu of fuses where applicable.
4. Unit to be equipped with a vehicle speed signal (VSS) to provide ground speed signal for body up fit components.
5. Electric back-up alarm, minimum 102 decibels (SAE J-994) mounted in rear, between frame rails.
6. Fender-mounted LED, dual, class "A" turn signal lights.
7. All marker lights shall be LED.
8. AUXILIARY SWITCHES - Minimum six (6) each additional 20-amp switches, to be dash mounted, and each to have individual, 20 amp breaker in main panel.
9. Junction box - (in cab) for body lighting connections and snow plow lights. Body wiring shall be color-coded and routed in PVC loom. Body installer shall furnish a wiring schematic.
10. Trailer socket - 7-pole socket for connecting trailer electrical plug to truck for trailer lights; to be equal to Cole Hersee No. 12310, and to be mounted at rear crossmember of truck, with sealed adapter housing equal to No. 11166.

**P. RUST AND CORROSION PROTECTION:** All frame and chassis fabrication, under cab, and under dump body shall be rustproofed with corrosion preventive compound meeting MIL-C-62218 specifications. Material shall be equal to Ziebart Tuflex.

**Q. STANDARD EQUIPMENT:** Unit shall contain all standard equipment listed as such in the manufacturer's latest literature unless otherwise stated within these specifications.

**R. ADDITIONAL EQUIPMENT:** Unit shall contain any additional equipment, not specifically mentioned but necessary, to make a COMPLETE and WORKABLE unit.

**S. REGULATIONS:** Unit shall meet any state or federal OSHA or DOT regulations as applicable.

**T. MANUALS:** Each truck shall be provided with an Owner's manual and a CD consisting of Service and Parts. All shall be current with year model of the equipment delivered and shall accompany the delivery of the truck.

**U. PRE-SERVICE:** All new equipment must be pre-serviced to the manufacturer's recommendations and in first class operating condition when delivered. All service

work shall be done in the vendor's place of business or in another location provided by the vendor. No major assembly or servicing of equipment will be allowed on Highway Department property. Only minor modifications to equipment necessary to bring the item into compliance with specifications will be permitted on Highway Department property. Units shall have a minimum of 1/2 tank of fuel when delivered.

**V. ADVERTISING:** Unit shall be entirely free of any and all advertising attachments of dealer, such as clips, license brackets, mud flaps or other devices bearing vendor's name.

**W. WEBSITE VEHICLE INFORMATION:** Units shall be provided with online information access for multi-users and shall include, but not limited to the following; Service Manuals, Service Bulletin Updates, Campaigns, Newsletters, Parts Manuals, Operators Manuals, Warranty Coverage, Warranty Coding, New Vehicle Processing and Standard Repair Time Information. These services shall be provided at no cost to the Kentucky Transportation Cabinet.

**X. TRAINING:** Vendor shall provide one day of training regarding the operation and maintenance on the unit described above.

## **Bid Option ITEM 2 - DUMP BODY WITH CENTRAL HYDRAULIC SYSTEM :**

**GENERAL:** To be a heavy-duty type with sides, ends, tailgate, and half cab protector constructed of 10 gauge 50,000 PSI hi-tensile steel. Body length shall be 14'-6" at the floor and 13' - 6" at the top minimum and an 84" inside width, 34.5-36" sides, and 36" tailgate for a minimum truck capacity of 10 to 12 cubic yards. The floor is to be constructed of 3/16" 100,000 PSI AR plate and extend at least 6" up on each side. Floor shall also be flat from front wall to rear tailgate except for 2" floor to sides radius in order to accommodate full-length spreader. Sides to be smooth with two formed inverted "V" corrugations full length of body side sheet. Body shall have 1/4" full rear bolster minimum of 18" wide, sloping rub rails, and full-boxed top rail of a maximum 2.5" width. A 3/4" round steel bar and open grid walk rail shall extend the full length of the outside of the body both sides. The butted understructure shall be 4" "I" beam crossmembers on 12" centers. The tailgate is to be sloped 12", heavy duty with completely boxed top bottom and side rails. The tailgate shall be minimum six (6) panel design with sloping reinforcements to shed dirt. Gate is to have spreader chains and banjo plates. All welds will be continuous on the body and tailgate except for the understructure.

Hoist cylinder to be single-acting telescopic type fully operable with hydraulic working pressure of 1500 PSI. Hoist shall be NTEA class 90 sub frameless design with a minimum first active sleeve of 6" diameter. The multistage sleeves to be chrome plated and have external packing gland nuts. Hoist cylinder shall be double acting design to provide power down.

The rear hinges shall be heavy-duty 2" steel pins with grease fittings and secured with retaining bolt and nut. Each rear hinge point shall have twin weld on plates. Safety supports capable of holding body in raised position shall be provided.

All wiring for the dump body shall be in metal conduits and attached securely to the body. The conduits shall be positioned and attached in a manner that minimum lengths of wiring extend from the ends of the conduit to the light fixtures. Bending conduit is permitted. Units shall have weatherproof sealed connectors packed with dielectric grease. The location of these dump body wiring connections shall be made just behind the truck cab and at the lamps only to limit contact with a wet environment (i.e. snow accumulation). A dash mounted amber led light shall indicate a raised dump body (Body-Up Warning Label shall be placed at this location). Shall be controlled by a hydraulic stainless steel pressure switch, mechanically actuated switch is not acceptable.

**AIR TAILGATE:** Tailgate will open and latch by pneumatic double acting cylinder with a minimum 2 1/2" diameter. Cylinder will operate an over-center bell crank device. A one-way check valve will be installed at the air reservoir. Cylinder will open and close by means of a 3-position in-cab aluminum air valve. (The over center bell crank device will hold tailgate in latched position in the event of an air pressure drop.)

**BODY TARP SYSTEM:** Each unit shall be furnished with a BODY TARP SYSTEM as described by these specifications. This shall be an Automatic (electric motor operated) Tarping System capable of being operated from within cab. The system shall be powered by chrome plated, direct drive Gear Motor that includes a 3-year warranty against parts wear out. The electrical system shall have One (1) manual Reset circuit breaker in cab and One (1) Automatic circuit breaker between switch and battery. The in-cab switch will be rated at 50 amps. An Indicator light shall automatically activate when Tarp is in use. The tarp pivot arms shall be polished aluminum and oval shaped. The pivot arms shall be (spiral torsion-spring) Type with a minimum of 4 springs per pivot. The Axle Shaft coupled to the direct drive motor shall be aluminum. A wind deflector shall be incorporated into the cab shield. Covering system shall be supplied with a wind deflector mounted on front of cab shield. Tarp material must be black 16-oz. vinyl coated nylon #5041, weight method. Material shall be certified to withstand temperatures from 450 degrees plus to minus 65 degrees Fahrenheit and have a hydrostatic resistance of 700 PSI. System shall be completely installed prior to application of corrosion prevention process.

Prior to installation, the dump body shall be sanded, cleaned, and primed with a product EQUAL TO Sherwin Williams HS Urethane Primer-Sealer E2-A820. After installation, the body, cab shield, and tailgate shall be painted BLACK with a product equal to Sherwin Williams, Acrylic Urethane/Ultra One-Stage System and SSR-510.

#### **ELECTRICAL:**

1. Taillight, stop and turn signal lights shall be set in dump body, rear corner posts. The exact location of the lights shall be determined and approved in conjunction with the dump body sub-contractor. Lights shall be Model 44, 4" diameter, LED lighting by Truck-Lite Co., Inc., or equal, with rubber grommet mounting, sealed connector wiring assembly packed with dielectric grease, and red lens.
2. Back-up lights shall be set in dump body rear corner posts. The exact location of the lights shall be determined and approved in conjunction with the dump body sub-contractor. Lights shall be Truck-Lite Co., Inc., or equal, Model 44, 4" diameter, LED, clear, with rubber grommet mounting and sealed connector wiring assembly packed with dielectric grease.
3. REAR LED AMBER LIGHTS: Two (2) LED amber lights shall be set in the dump body rear corner posts (one light in each post). These 4" diameter, LED lights shall conform with SAE J1318 Class 1 W5 as applicable to LED lighting. The LED strobes shall operate using 12VDC with self-contained flash controllers and operate in quad flash mode. Full-length PVC jacketed cable shall be used between cab and light pigtail with connection to be sealed using heat shrink. Also, a service loop of a minimum of 18" shall be included in the length of wire. Wiring shall be connected to an in-cab mounted fused terminal block (each leg fused).
4. CAB SHIELD LED AMBER EMERGENCY LIGHTS: Two- (2) self-contained LED, amber emergency lights (equal to SIGNAL 255HTSL LED Amber Beacon), shall be mounted on the dump body cab protector's shield (one on each side). Lights shall operate using 12VDC with self-contained flash controllers and operate in

quad flash mode. The base of the LED light shall have provisions for both 1" pipe mounting and dimples for permanent/flat mounting. The unit shall have a single amber, frenal type LEXAN® or polycarbonate lens. Each overall light shall not exceed 4.5" high by 5.75" in diameter. The LED light shall meet applicable SAE specifications and be certified by ASMVA/AMECA in appropriate safety colors. Full-length PVC jacketed cable shall be used between cab and light pigtail with connection to be sealed using heat shrink-wrap. Also, a service loop of a minimum of 18" shall be included in the length of wire. Wiring shall be connected to an in-cab mounted fused terminal block (each leg fused).

5. PLOW LIGHT HARNESS: Plow light harness shall be provided from body builder independent from truck electrical system and shall provide circuits for standalone L/R turn signal, park and plow lights. Un-interrupted circuits shall be supplied on driver and passenger inside frame rail to front, looped for leads to left and right top inside fender, equipped with male connector for Truck-Lite kit 80805.
6. SPREADER LIGHT, clear, to be provided (installed by Nelson County Fiscal Court after delivery) with wiring run and harness for installation below left and right rear corner of dump body. Switch to be located on dash.
7. JUNCTION BOX - (in cab) for body lighting connections and snow plow lights. Body wiring shall be color-coded and routed in PVC loom. (Wiring schematic shall be furnished by body installer.)

**CENTRAL HYDRAULIC SYSTEM:** The central hydraulic system described herein shall be of open-center design and as described in detail by the following specifications. The system is designed to operate a dump body hoist, a front-mounted snowplow with lift and reversing cylinders, and a salt spreader with ground speed oriented control system. Provisions shall be made for the PTO to be mounted on the transmission with a clutch pack system. The pump and drive shall be capable of withstanding continuous use at 3000 RPM with a hydraulic output pressure of at least 2000 PSI. The pump shall have pressure balanced, bronze wearplates, and 1" minimum diameter keyed input shaft. Pump shall also have an inverted Teflon shaft seal in addition to the normal high pressure seal, to prevent air inclusion into pump oil supply that may occur during cold weather start up. Pump suction port shall be of sufficient size to allow proper fill at 3000 RPM. Minimum allowable size 1-5/8-12. Pump provided shall be equal to the Model P330 series as manufactured by Commercial Intertech Corp. The pump output shall be capable of providing hoist cylinder extension required for a 50-degree body dump angle within 24 seconds at 1700 engine RPM at 1500-PSI load. The pump shall be mounted on a specially constructed bracket supported by the main chassis front frame extension. Mounting on the bumper will not be acceptable. Properly sized journals and drive yokes shall be incorporated to connect the pump and drive flange with an angular misalignment no greater than 4 degrees and not less than 1 degree. Pump drive shaft assembly shall be a splined and slip-yoke assembly equal to Spicer Series 1260-1310 to absorb relative movement between engine and pump. A raised radiator or other adequate access for the pump drive shaft shall be provided. A field-cut radiator opening will not be permitted.

The pump output flow shall be directed to a solenoid piloted type relief and dump valve assembly, with the valve mounted directly to the pump by means of a 1" SAE split flange pump outlet port. Valve shall be nominally rated at 40 GPM @ 3500 PSI with a maximum pressure drop of 45 PSI when pump output of 30 GPM is diverted directly to oil reservoir. Valve to be of manifold or block design with all cartridge elements, including pilot directional spools and adjustable relief valve of the replaceable thread-in cartridge type. Solenoid valve electrical coils and retaining method shall be of the fully sealed and weatherproof design. In the "system off" condition, the valve will normally allow all pump output to be diverted directly back to the reservoir. The pilot controlled directional shifting system must be of the sequenced soft-shift design to reduce pressure spikes and surges in the hydraulic system when the system is turned "on" or "off" or when spreader operation is selected. The valve assembly return line shall be isolated from all other return lines by use of inline, low flow restriction, check valves in return connections at the filter manifold. All valve ports to be of the SAE "O" ring seal type. An in-cab, mounted, electrical switch with pilot light will be used to shift the cartridge element type solenoid piloting valves to divert all pump output to the main bank valve assembly and all other downstream components for operation. Full pump output shall be available for main bank valve operations when Spreader circuit is not in use. A PROPORTIONAL FLOW DIVIDER VALVE nominally rated at 40 GPM capacity, shall divide the pump output equally between the spreader control valve and the main directional bank valve assembly. The flow divider circuit shall be activated automatically by the spreader control valve on/off switching system. Flow to the main bank valve shall be combined with flow from the spreader circuit flow divider port when spreader circuit is operational and no bank valve functions are operated.

An AUTOMATIC hydraulic/electric switching system shall be incorporated in the solenoid piloted diverting valve system and shall be designed to automatically divert all pump output flow directly from the dump valve assembly to the oil reservoir in the event of a downstream hose failure, and also if the oil level in the oil reservoir reaches a low level. The system shall automatically sound an audio alarm and illuminate a console warning light to indicate such failure. The warning light shall be a press-to-test light and incorporate a switching system into the automatic shut down assembly to simulate a hydraulic system failure.

An in-cab electrical/manual over-ride shall be provided to allow momentary operation of hydraulic functions in emergency situations. All switching system components and relays shall be encased in a protective enclosure or console installed in the cab. All exterior cab wiring shall utilize multi-strand "SO" jacketed cable with DIN 43650 weather tight connectors.

The MAIN BANK VALVE shall be mounted behind the truck cab between the main chassis frame rail sections. Valve shall be of the stack section type and of parallel circuit design. Valve assembly shall have a rating of 40 GPM @ 3000 PSI with a maximum pressure drop of 30 PSI @ 35 GPM from inlet to outlet ports (all spools in neutral position). All valve porting to be minimum 1-5/16-12 UNF2B sizing. Main valve-bank shall consist of: one (1) integral pilot operated screw adjustable relief valve

cartridge in main inlet section preset at 1500 PSI; one (1) 4-way, three position spring centered valve section to raise, hold, and lower the DOUBLE ACTING dump body hoist; one (1) 4-way, three position spring centered valve section for snowplow lift with integral work port relief set at 700 PSI for plow down pilot control of a load lock valve on plow cylinder circuit; one (1) 4-way, three position spring centered motor spool valve section to reverse snowplow angle; one (1) high pressure carryover outlet to feed dual flow spreader control valve. (NOTE: Spreader control valve assembly to be mounted in the cab). The hoist cylinder power-down work section shall be equipped with a 400-PSI set, work port relief and an anti-cavitation check valve. For the snow plow lift circuit, a PILOT OPERATED CHECK VALVE, with emergency pilot release, and adjustable pressure-compensated flow control with reverse free-flow check, shall be installed to hold the snow plow in the up position and to also limit the downward cycle speed.

The main bank valve control tower shall consist of three, rod-type shifting levers with sealed cable mounting housings and position legend plates stating operating function of lever. All controls shall be mounted in an aluminum seven (7) gauge center console and shall provide operator with ease of functions with front forward control capabilities. Levers to be vertically mounted with a 10-degree vertical offset. Levers shall operate push-pull type cable with 0.250-inch diameter stainless steel rod ends. Inner cable member shall be 18-8 stainless steel armored and wrapped construction with a low resistance nylon liner. Cable casing shall be high-density polyethylene covered tempered steel wire strand conduit. Cable to valve connection shall be of the weather tight bonneted type with both ends of valve spools sealed. (Reference: RVO-45600 Series Felsted or equal). The spreader control system shall incorporate a dual flow spreader control valve to be enclosed in a, ten (10) gauge Stainless Steel, weather resistant enclosure located on frame rail.

The Spreader control valve shall be of the cartridge/manifold design and shall consist of two (2) linear proportional solenoid flow control valves of the direct acting piston type specifically designed for pulse width modulated driving circuits; two (2) pressure compensator elements and automatic shutoff/bypass circuit valving. Valve shall be functionally equal to Vickers Model 4885-00-20, or other approved type of PWM, cartridge/valve body assembly. Solenoid valves shall utilize DIN43650 plug type wire connectors. All valve circuit elements to be of the screw-in cartridge type to permit easy repair or replacement. All manifold porting for hose connection to be of the SAE thread O-ring seal type. Valve assembly to be designed to provide flow rates, with a minimum pressure drop, required for proper spreader operation at programmed material application rates selected by the Department of Highways. Spreader Control Valves shall be located on driver's-side outer frame rail.

The dual flow ground speed oriented spreader control system shall be of the CLOSED LOOP microprocessor based type with nonvolatile control memory. Automatic calibration and flexibility of programming are required. System must be capable of operation in ground speed oriented closed loop, manual set, blast and unload modes. Automatic switchover with display indication from closed loop to open loop operation in the event of loss of feed rate sensor signal shall be provided. Control

console digital readouts shall be capable of displaying actual application rate, vehicle ground speed, and distance of spread route driven and total quantity of material spread. Programming and output cable connection for material and trip information printer shall be provided. Control unit shall be capable of accumulating such display information up to 999,999 miles and 999,999 tons of discharged material. Console programming shall be capable of selection, calibration, and display of four separate spread materials with independent application rates of each material capable of being set to fixed rates or to rate increments of a preset maximum application rate. A variable digital access code lockout for application rate selection shall be provided. Back-lighted touch switches and LCD shall be utilized for onboard programming and for display readout and application rate selection. Material spread width to be selectable by a 12 detented position switch. Display must enunciate error message and sound audio alarm when the microprocessor system detects any loss of control or accuracy. Indicator light to signal a clogged or stalled spreader shall be provided.

Truck and conveyor (or auger) speed sensors shall be furnished. The conveyor/auger sensor shall be of the photoelectric type and shall produce 360 digital counts (pulses) per revolution of the shaft to provide for accurate feedback at extremely low shaft speeds. Truck speed sensor shall be compatible with type of speedometer drive system supplied on the chassis. A built-in ground speed simulator shall be provided in the microprocessor control unit. All components required for proper installation and operation of control system onto truck and spreader units shall be supplied. Electronic control system shall be Dickey-John ICS 2000 control system or equal.

Note: No hydraulics located within cab.

A HYDRAULIC OIL RESERVOIR of forty- (40) gallon capacity at normal operating oil level, shall be flex mounted to chassis frame rail. Tank shall be constructed of seven (7) gauge steel (minimum) and be equipped with a combination of oil filler-breather cap with removable five hundred (500) micron strainer, combination oil level sight gauge and thermometer an in-tank SUCTION PORT STRAINER shall be provided equal to HYCON, or SCHRODER, 125 wire mesh, 2" NPT, with 3 PSI bypass spring valve, and a minimum of two internal baffles. A 3/4" IPT drain boss and plug shall be provided in the bottom of tank. All return line oil shall be discharged into tank, through filter assembly, not less than six (6) inches below normal operating oil level. Tank shall be stenciled in 1-1/2" letters "HYDRAULIC OIL - C2 or C3". Hydraulic system to include a ten (10) micron paper, replaceable spin-on CARTRIDGE TYPE RETURN LINE FILTER of 45 GPM capacity with integral 15 PSI bypass spring/valve. The filter unit shall be equipped with a condition gauge positioned such that the filter can be readily checked by the operator. Return line filter to be isolated from reservoir by a BRASS GATE VALVE with 1-1/4" NPT minimum porting. One (1) extra replacement element for filter shall be provided for each truck. Filter assembly to be positioned as close to reservoir tank as possible and in an easily accessible service location. Minimum suction porting to be 2" NPTF.



All hydraulic hoses shall meet or exceed the enclosed specification. Each hose assembly (hose with fittings) except for suction hose, shall be fitted with JIC 37-degree swivel fittings located at each point of hose and component connection. All pressure line hoses shall meet or exceed SAE specification 100R2 and shall be equal to Gates high pressure hose, type C2AT for sizes up to and including 1" nominal I.D. Suction line hose shall be 2" nominal I.D. SAE specification 100R4 braided fiber, spiral wire-reinforced, rubber-covered hose with replaceable bolt-on type fittings. All hydraulic hoses shall be fully installed and ready for operation. Spreader control valve pressure lines and a reservoir tank return line shall be manifold mounted at the center of frame rear crossmember. These lines shall be equipped with Parker Series 60 stainless steel QUICK DISCONNECT VALVED COUPLERS and metal plugs in the following sizes: spinner pressure 1/2"; conveyor pressure 3/4"; return line 1". Use of iron or galvanized iron pipe for fittings is not acceptable. All fittings to be of steel type designed for hydraulic system use. All pipe thread fittings to be coated with liquid Teflon pipe sealer before assembly. Teflon tape not acceptable. Hydraulic lines to and from the spreader manifold point to be made with steel pipe or heavy wall tubing rated at 2000 PSI normal working pressure. Pipe or tubing shall be thoroughly cleaned prior to assembly to remove loose scale or foreign material. All tubing and/or pipe must be properly supported with clamps and bushings. A short hose may be used at the ends of each run to facilitate connections. Hose shall be run to front mounted quick disconnects located behind the bumper for the snow plow cylinders (lift and angle) and equipped with 1/2" Parker Series 60 stainless steel valved quick disconnect couplers and plugs.

Any items not specifically stated herein, but necessary for proper system operation, shall comply with recommended mobile hydraulic industry standards. Vendor shall be responsible for initial servicing and pre-testing of hydraulic system which shall include the following:

1. Initial fill of reservoir with a high grade hydraulic fluid to forty (40) gallon level, to be marked on sight glass.
2. Start-up and initial run of hydraulic system, checking for leaks, proper pressure settings, excess heat, system efficiency, etc. Vendor shall be responsible for replacing any defective component. Vendor will not be responsible for initial test of spreader and plow circuit if equipment is not available to do so; however, vendor will be responsible for any defects discovered at the time of installation of spreader and plow.
3. After initial start-up and system check, vendor will re-check oil level in reservoir and fill to marked level, if required.

**MANUALS:** Each unit shall be provided with an Operator's, Service and Parts manuals. All shall be current with equipment delivered and shall accompany the delivery of the truck.

**WARRANTY:** The entire body and all hydraulic components shall be covered for one (1) year or the period stated in the manufacturers standard warranty if greater. This shall cover 100% parts and labor. Warranty shall begin when unit is place in service.

The warranty shall begin the date the unit is placed in service. A copy of the warranty statement shall be provided with delivery of unit. All warranty service shall be provided by an authorized location/s within the Commonwealth of Kentucky.

**PARTS AND SERVICE:** Successful vendor shall be able to provide OEM repair parts/service on total unit within 48 hours after receiving notification from the Division of Equipment of equipment breakdown. Service work shall only be performed by manufacturer trained and certified technician. This service shall be provided 24/7 enabling the Kentucky Transportation Cabinet to obtain parts and repair services during non-scheduled emergency events. Repair and Service facility shall be located within the Commonwealth of Kentucky. Transporting of units to repair/service facility shall be the responsibility of the assigned owner.

**TECHNICAL SUPPORT:** Technical support on all body installed components and equipment shall be provided by a 24-hour customer support toll free line. This service shall be provided at no expense to the Kentucky Transportation Cabinet. Contact information shall be submitted with bid packet.

**TRAINING:** Vendor shall provide training which will cover the proper set-up, calibration, operation, and maintenance of the hydraulic system and control systems.

**Bid Option ITEM 3 - Chassis Paint- (In Lieu of White)**

Unit price shall be provided for chassis color to be factory painted  
Light Grey = Sherwin Williams Color # 42082