

**DIRECTOR OF ROADS**

Robert Hoepfner, P.E.

**FINANCE DIRECTOR**

Michelle M Mykytiak

**PURCHASING DIRECTOR**

JoAnna K. Strizic

**Invitation to Bid on: One (1) New Stock/New Show Tandem-Axle Truck Chassis  
With Dump Body, Underbody Scraper, Front Plow and Combination Insert**

Sealed bids will be publicly opened at **11:00** A.M., E.S.T. on **Wednesday September 7, 2011** at the office of the Macomb County Department of Roads, 117 S. Groesbeck, Mt. Clemens, Michigan, 48043 for the furnishing of the above materials, services, equipment, work and/or supplies in accordance with the terms, conditions and specifications as stated herein and hereto attached.

1. The Director of Roads reserves the right to accept any and all alternate proposals, bids or quotes and to award the contract to other than the lowest Bidder, waive any irregularities or informalities or both, to reject any and all bids, quotes and proposals, and in general to make the award of the contract in any manner deemed by the Director of Roads, at his sole discretion, to be in the Department of Roads best interest. In case of error in the extension of prices in the bid or other arithmetical error, the unit prices will govern.
2. The bid must be delivered in person or sent by mail to the Macomb County Department of Roads, 117 S. Groesbeck, Mt. Clemens, Michigan, 48043. **It shall be in a sealed envelope marked with the name and address of the bidder on the outside of the envelope. The above referenced bid number should also be highlighted on the outside of the envelope. In addition, if the bid is to be express mailed, "Bid Documents Enclosed" must be conspicuously marked on the package.** Facsimile and/or e-mail transmitted bids will **not** be accepted.
3. The bidder shall assume full responsibility for delivery of bids prior to the appointed hour for opening same and shall assume the risk of late delivery or non-delivery regardless of the manner employed for the transmission thereof. Bids shall be accepted at any time during the normal course of business only, said hours being 8:00 am to 4:30 pm, Monday through Friday, legal holidays excepted. A bidder may withdraw their bid response by written request at any time prior to the scheduled bid opening. Any bid received after the scheduled opening time will **not** be accepted and will be returned unopened. No bid may be withdrawn, changed, or modified in any way for a period of sixty (60) calendar days from the date of the bid opening.
4. IT IS UNDERSTOOD THAT THE MACOMB COUNTY DEPARTMENT OF ROADS IS A GOVERNMENTAL UNIT AND AS SUCH IS EXEMPT FROM THE PAYMENT OF ALL STATE AND FEDERAL TAXES APPLYING ON THE ABOVE MENTIONED ITEM AND ALL PRICES QUOTED SHALL NOT INCLUDE ANY SUCH TAX.
5. The total price quoted by the Bidder must be the total cost delivered to the location(s). All goods are to be shipped F.O.B. Shipments sent C.O.D. without the Department of Roads consent will not be accepted and will, at the Contractor's risk and expense, be returned. Unauthorized shipments are subject to rejection and returned at the Contractor's expense.
6. The bidder by execution of the proposal thereby declares that the bid is made without collusion with any other person, firm or corporation making any other bid, or who otherwise would make a bid, and agrees to furnish all bid items in strict accordance with all Federal Regulatory Measures.
7. All bids must be submitted on the Department of Roads form of bid blank. The bid shall be legibly prepared in ink or typewriter. Erasures or alterations must be initialed by the bidder.

8. Submission of a bid will be construed as a conclusive presumption that the bidder is thoroughly familiar with the Bid Proposal and Specifications and that he understands and agrees to abide by each and all of the stipulations and requirements contained therein.
9. In the specifications, whenever an article or material is defined by brand name, the name and catalog number of a particular manufacturer, vendor or a limited description, the term "OR APPROVED EQUAL" is written. Any reference to a particular manufacturer's product either by brand name or limited description is only for purposes of setting a standard of performance, quality, composition, construction or size.
10. Successful bidder must furnish a State of Michigan Motor Vehicle Certificate of Title, properly executed for any equipment requiring same.
11. The Director of Roads reserves the right to award the bid for the equipment which best fits our needs and appears to be in the best interest of the Department of Roads at the time the bids are evaluated.
12. The Macomb County Department of Roads reserves the right to terminate the contract without penalty upon thirty (30) days written notice, due to poor performance or for reasons deemed to be in its best interest. The Macomb County Department of Roads reserves the right to re-award the contract to the second most qualified vendor, re-propose, re-quote or re-bid the contract or do whatever is deemed to be in its best interest.
13. Bidders aggrieved by an award of any resulting contract may file a written notice of protest with the Purchasing Director within seven (7) calendar days of the award by the Macomb County Department of Roads
14. When applicable, contractor must furnish material safety data sheets for their products.
15. BIDDERS ARE REQUIRED TO SUBMIT COMPLETE AND COMPREHENSIVE DATA AND DESCRIPTIVE LITERATURE COVERING THE ITEM PROPOSED TO BE FURNISHED. VENDORS SUBMITTING ALTERNATE BIDS MUST PROVIDE SPECIFICATIONS DOCUMENTING PRODUCT IS EQUAL TO SPECIFIED BID ITEM. BIDS SUBMITTED WITHOUT THE ABOVE DOCUMENTATION WILL BE CONSIDERED NON-RESPONSIVE AND REJECTED.
16. THIS BID BY MUTUAL AGREEMENT OF BOTH PARTIES may be extended for additional one (1) year periods, each year hereafter, but not to exceed a maximum of two (2) additional years.
17. Prior to furnishing the requested products and services, it shall be the responsibility of the awarded vendor to obtain all licenses and permits required to complete this contractual service, at no cost to the Macomb County Department of Roads. These licenses and permits shall be readily available for review by the Administration and Purchasing Personnel.
18. Vendors will provide a general history, description and status of their company.
19. All applicable Federal and State laws and rules and regulation over the project shall apply to the project contract throughout and will be deemed to be included in the contract herein written out in full.
20. The Macomb County Department of Roads adheres to Title VI related requirements as outlined in USDOT Regulation 49 CFR-Part 26, Appendix A of MDOT Bidding Specifications, and the MCDR Policy #407. The Macomb County Department of Roads is an Equal Opportunity Agency.
21. The Macomb County Department of Roads will not pay fuel surcharges.

22. The only **official** document is available over the internet at [www.rcmcweb.org](http://www.rcmcweb.org) or [www.mitn.info](http://www.mitn.info).
23. All documents and correspondence submitted to the Macomb County Department of Roads becomes the property of the Department of Roads and is subject to disclosure under the "Freedom of Information Act". This Act provides for the complete disclosure of contract and attachments.

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Copies of Bids and Bid Tabs are available on the following websites:  
[www.mitn.info](http://www.mitn.info) or [www.rcmcweb.org/viewpage/bids.cgi](http://www.rcmcweb.org/viewpage/bids.cgi)

**PROPOSAL**

WE, THE UNDERSIGNED, agree to furnish to the Macomb County Department of Roads one (1) new stock/newshow tandem-axle truck chassis with dump body, underbody scraper, front plow and combination Insert, conforming to the attached specifications at the pricing indicated as noted. F.O.B., 34592 Nova, Clinton Township, Michigan.

The undersigned herein submitted this bid or proposal and agrees to enter into an agreement with the Macomb County Department of Roads in accordance with the bid documents. In submitting this complete and signed proposal, it is understood that the right is reserved by the Macomb County Department of Roads to reject any or all bids or proposals and to make such award that is in the best interest of the Macomb County Department of Roads

MAKE \_\_\_\_\_

MODEL \_\_\_\_\_ YEAR \_\_\_\_\_

ORIGIN \_\_\_\_\_

DELIVERY DATE \_\_\_\_\_

BODY COMPANY \_\_\_\_\_

UNIT PRICE \$ \_\_\_\_\_

COMPANY NAME: \_\_\_\_\_ ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_ DATE: \_\_\_\_\_

PHONE NO.: \_\_\_\_\_ FAX NO.: \_\_\_\_\_

E-MAIL ADDRESS: \_\_\_\_\_ TERMS: \_\_\_\_\_

**INDEMNIFICATION**

The Macomb County Department of Roads will not be responsible for injury to contractor’s employees, sub-contractors, or to third parties caused by the contractor’s agents, servants or employees. Therefore, the contractor agrees to incorporate the below hold harmless agreement into the required insurance and to be evidenced by being contained in the certificate of insurance. Further, the below listed indemnification is incorporated and is part of the subject contract.

“The contractor agrees to protect, defend, indemnify and hold the MCDR and its directors, officers, employees and agents free and harmless from and against any and losses, penalties, damages, settlements, costs, charges, professional fees, or other expenses or liabilities of every kind and character arising out of or relating to any and all claims, legal fees, liens, demands, court costs, obligation, actions, proceedings or causes of action of every kind and character in connection with or arising directly or indirectly out of this agreement and/or the performance hereof. Without limiting the generality of the foregoing, any and all such claims, etc. relating to personal injury, death, damage to property, defects in materials or workmanship, or any actual or alleged violation of any applicable statute, ordinance, administrative order, rule or regulation, or decree of any court, shall be included in the indemnity hereunder”.

“The contractor further agrees to investigate, handle, respond to, provide defense for and defend any such claims, etc. at his sole expense and agrees to bear all other costs and expenses related hereto, even if it (claims, etc.) is groundless, false or fraudulent. In any case in which this indemnification would violate legal prohibition, the foregoing provision concerning indemnification shall not be construed to indemnify the MCDR for damage arising out of bodily injury to persons or damage to property caused by or resulting from the sole negligence of the MCDR, its director’s, officers, employees or agents”.

**WORK REFERENCES**

Name of Company	Location	Name of Person Approving Work and Telephone No.	Time Period of Project



## **INSURANCE**

The following insurance shall be obtained:

- |    |   |  |
|----|---|--|
| A. | Comprehensive General Liability including   | \$1,000,000 per occurrence and<br>\$2,000,000 aggregate  |
|    | 1. Products and completed operations  |  |
|    | 2. Broad form property damage   |  |
|    | 3. Premises operations  |  |
|    | 4. Broad form contractual   |  |
|    | 5. Personal injury  |  |
| B. | Workers' Compensation Employers Liability Statutory<br>Coverage and Employer's Liability Limits of: | \$500,000/\$500,000/\$500,000  |
| C. | Automobile liability including hired and leased<br>vehicles owned and non-owned autos               | \$1,000,000 CSL or \$500,000 per person<br>\$1,000,000 per accident \$500,000<br>property damage |

Personal Injury Protection – Statutory Limits and Property Protection Insurance - \$1,000,000 Limit.

Supplemental Environmental Auto Liability (SEAL) coverage or insurance that covers the loading and unloading of scheduled pollutants is required.

## **CERTIFICATES OF INSURANCE (GENERAL)**

All certificates of insurance and duplicate policies of an outsider, vendor or contractor shall contain the following clauses:

- A. "Underwriters shall have no right of recovery or subrogation against the MCDR (including its agents and agencies as aforesaid), it being the intention of the parties that the insurance policy so effected shall protect both parties in primary coverage for any and all losses covered by the subject policy."
- B. "Any coverage afforded the MCDR shall apply as primary and not excess to any insurance issued in the name of the MCDR, et al."
- C. "The insurance company(s) issuing the policy or policies shall have no recourse against the MCDR for payment of any premiums or for assessments under any form of policy."
- D. "The term 'insured' is used severally, not collectively but the inclusion in this policy of more than one insured shall not operate to increase the limit of the MCDR's liability."

All certificates are to provide thirty (30) days written notice of material change or cancellation. Certificates of Insurance and insurance binders must be provided not less than ten (10) working days before commencement of work to the Macomb County Department of Roads, 117 S. Groesbeck Hwy., Mt. Clemens, MI 48043. Insurance carriers are subject to the approval of MCDR.

## FEDERAL EMPLOYER IDENTIFICATION

COMPANY NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_ DATE: \_\_\_\_\_

PHONE NO.: \_\_\_\_\_ FAX NO.: \_\_\_\_\_

E-MAIL ADDRESS: \_\_\_\_\_ TERMS: \_\_\_\_\_

FEDERAL EMPLOYER IDENTIFICATION NUMBER: \_\_\_\_\_

Which is (check one of the following:)

( ) Corporation, incorporated under the laws of the State of: \_\_\_\_\_

( ) Partnership, consisting of (list partners): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

( ) Assumed Name (register no.) \_\_\_\_\_

( ) Individual \_\_\_\_\_

When payment on such order or contract is to be directed to the same company at an address different from above, fill in the following address:

\_\_\_\_\_

\_\_\_\_\_

## Macomb County Department of Roads

*Specifications for:*

### **ONE (1) TANDEM-AXLE TRUCK CHASSIS With Dump Body, Underbody Scraper, Front Plow and Combination Insert**

#### **General Description**

This specification describes one (1) tandem-axle class eight (8) truck cab and chassis with dump body, underbody scraper, salt spreader and combination insert. These multi-purpose vehicles will be used in road maintenance and snow removal operations. Bidders must submit their bid on units that meet or exceed these specifications.

#### **General Requirements**

Units offered under this advertisement shall be new stock / new show standard production models of the latest design in current production. Units offered shall be equipment that is established, reliable and in successful operation. Units of experimental or unproven design are not acceptable. All components requiring lubrication or oil shall be provided with the proper type and amount before delivery.

Bids will be considered only from vendors who offer equipment that is manufactured by companies that are known to be skilled and have been regularly engaged in the manufacture of equipment of the type, class and size specified herein for a period of not less than five (5) years. Bidders must be a manufacturer authorized sales and service facility of class "A" license dealer for the product offered.

The origin and availability of service and parts for the major components must be stated. Qualified service and factory replacement parts must be available on a regular basis, within the State of Michigan and at a permanently established location.

The bidder must submit with their bid, the latest printed manufactures specifications and advertising literature on the units they propose to furnish, along with their tentative build sheet, which identifies the specific components being offered. Bodybuilders shall also include a build sheet or quote sheet, which specifically identifies the components being offered. This information shall be included in the bid package.

Bidders are expected to quote price and delivery of equipment they propose to furnish giving careful consideration to the specification. Any deviations from these specifications shall be submitted with the bid in writing, with full detail of each variation with reference made to each item to which the variation applies. If these deviations are not submitted with the bid, the entire bid will be considered non-responsive.

Delivery time, past performance of the bidder and/or the equipment offered, as well as price, will be considered major factors in determining the successful bidder.

Each bid shall clearly indicate the vehicle order cut off dates (if applicable) for the quoted vehicles. Bids shall also indicate percentage escalation of the quoted price if the purchase order received by the bidder is beyond the vehicle order cut off date due to model year changes as set by the vehicle manufacturer.

The manufacturer's warranty and/or component warranties must be stated. Unsatisfactory or inadequate warranty provisions shall, in themselves, be justification for the denial of the award of this bid by the Macomb County Department of Roads.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
<b>ENGINE AND ENGINE EQUIPMENT</b>			
<p>Engine: The engine shall have current EPA Certification as being Emission Compliant. It shall be a turbo-charged diesel engine, four-stroke, six-cylinder, 11-Litre (minimum) with a minimum advertised rating of 390 HP @ 2100 rpm governed speed, 1400 lb-ft torque @ 1000 rpm: 390 peak hp max. Approved Engine, non SCR Engine example - International MaxxForce 11</p>			
<p>Engine Warning Device: An audible/visual alarm/shutdown feature (for low oil pressure, overheating, low water level with automatic override), shall be included in engine electronics.</p>			
<p>Engine Electronics: Communications shall be J-1939 (datalink) based and fully compatible with all other truck components and systems.</p>			
<p>Diagnostic Aids: The successful bidder shall provide the appropriate engine manufacturer's diagnostic software, as well as all upgrades of software that are made during the warranty period of the engine. The successful bidder shall verify software compatibility to MCDR hardware. If software is non-compatible with MCDR's existing hardware, the successful bidder shall provide new hardware. All necessary manuals, cables, adapters and training shall also be provided, thereby enabling MCDR technicians to properly troubleshoot engine related problems.</p>			
<p>Air Induction System: Donaldson, or approved equal, 16" two (2) stage filter with under hood inside/outside air intake "snow-diverter" valve capable of providing dry, clean air under all seasonal conditions, controlled by a switch located inside the cab.</p>			
<p>Engine Coolant: Extended Life Coolant/Anti-Freeze.</p>			
<p>Radiator: Radiators that are modified to provide PTO shaft clearance, or shaft installations that pass through the radiator.</p>			
<p>Fan Clutch: An on-off type shall be provided.</p>			
<p>Starting Motor: Shall be a Delco-Remy 12-Volt Model 42MT Positork with over-crank protection, or approved equal. Ground wire grounded to frame. Note: A 12V gear reduction equivalent to the above specified starter is acceptable.</p>			
<p>Alternator: Shall be a Denso model 101211-8120 with a rating of 12V-130 AMP. Note: In the event the Denso Alternator is NOT available, a Delco-Remy 22SI with a rating of 12V-130 AMP shall be substituted.</p>			
<p>Batteries: Group 31 Truck-Type, maintenance free 12V batteries shall be provided, for a total of 3000 CCA.</p>			
<p>Exhaust System: Shall consist of a single vertical muffler and pipe "frame-mounted" behind the cab with aluminized steel flex sections, safety heat shield and 90 degree turnout. Note: EPA '10 regulations mandate that the exhaust cannot be moved or modified in any way subsequent to the assembly of the truck. Therefore it is critical that any bodybuilders exhaust needs be addressed at the time of the paper pilot.</p>			
<p>Diesel Particulate Filter: to meet emission requirements, a diesel particulate filter (DPF) shall be provided. The filter shall be mounted in such a way that it accommodates the body and chassis manufacturer requirements and will be decided at the time for the paper pilot.</p>			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Primary Fuel Filter: Fuel Filter/Water Separator w/ electric pre-heater shall be provided. Racor 6903E, Davco 382, or approved equal.			
Fuel Filter/Water Separator Location: The fuel filter/water separator shall be located in a protected area. Note: It shall NOT be located in the front passenger-side wheel well area where it is susceptible to being knocked off or damaged by the pushing of heavy snow and ice.			
Oil Pan Corrosive Protection: The oil pan shall have added anti-corrosion protection.			
Oil Filter & Bypass: Engine-mounted spin-on oil filters shall be provided.			
Oil Check and Fill: An engine-mounted, easy side access check and fill tube shall be provided.			
Air Compressor: 15.9 CFM minimum rated			
Auxiliary Charging of the Air System: A Schrader-type inflation valve shall be incorporated into the air system, mounted on the firewall, so as to provide a means to "charge" the air system in the event of a "down" condition.			
Engine Block Heater: A Phillips 1500 Watt, 120 Volt shall be provided.			
Front-Mount PTO Drive-Flange: Adapter for Spicer 1350 Flange driveshaft shall be provided.			
<b>TRANSMISSION AND TRANSMISSION EQUIPMENT</b>			
Transmission: Allison 4500 RDS transmission 4 <sup>th</sup> generation controls wide ratio, 6-speed.			
Transmission Warranty: Allison Extended Transmission Coverage shall be provided, for a total of five (5) years warranty coverage (standard and ETC).			
Transmission Lubricant: Shall be Allison TranSynd™ per the Allison Vocational Model ETC warranty requirements.			
Trans Cooler: An Allison-approved cooler shall be provided.			
Trans Controls: An Allison Vocational Model pushbutton controller shall be provided.			
Driveline: Driveline shall be a Spicer "Lifeline" torque-matched sealed unit.			
Diagnostic Aids: The successful bidder shall provide one (1) Allison DOC™ For Fleets (3000/4000) v2.0 diagnostic system, as well as all upgrades of software that are made during the warranty period of the transmission. The successful bidder shall verify software compatibility to MCDR hardware. If software is non-compatible with MCDR's existing hardware, the successful bidder shall provide new hardware. All necessary manuals, cables, adapters and training shall also be provided, thereby enabling MCDR technicians to properly troubleshoot transmission related problems.			
<b>FRONT AXLE</b>			
Front Axle: Set back axle, Meritor Model MFS-20-133A Wide track, 20,000 lbs. capacity.			
Front Suspension: Shall be 20,000 lb. minimum capacity rated flatleaf type.			
Steering: Power steering with RH power assist provided.			
Note: Dual power steering gears shall be required on 16,000 lb. front axles and greater.			
Front Brakes: Shall be Meritor Q-Plus 16.5 x 6" S-Cam Type.			
Front Slack Adjusters: Shall be the Arvin-Meritor automatic adjusting type. Stainless steel pins			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Front Dust Shields: Shall be provided			
Front Shock Absorbers: Double acting single, heavy duty.			
Oil Seal Cap: Shall be Stemco visible cap type w/drain, or approved equal.			
Oil Seals: Shall be Stemco Discover seals, or approved equal.			
Front Hub Lubricant: Shall be synthetic type lubricant.			
<b>REAR AXLE AND REAR AXLE EQUIPMENT</b>			
Rear Axle: Meritor RT46-160P; 46,000 lb. capacity with an appropriate gear ratio that ensures a minimum fully loaded road speed of fifty-five (55) miles per hour matched to electronic engine characteristics that will provide a good balance between economy and performance at a road speed of sixty (60) miles per hour.			
Rear Axle Lubricant: Shall be the synthetic type.			
Rear Axle Oil Seals: Shall be Stemco Discover seals, or approved equal.			
Rear Suspension: Hendrickson PRIMAAX EX 55" Axle spacing, 46,000-lb capacity, 9.0: ride height shock absorbers in standard location			
Rear Brakes: Shall be the 16.5 X 7" Meritor Q-plus S-Cam for tandem axle type			
Parking Brake Chambers: Four (4) sealed spring brake chambers, MGM/Anchorlok w/minimum 3-year warranty, shall be provided.			
Rear Slack Adjusters: Shall be the Arvin-Meritor automatic adjusting type. With stainless steel pins.			
Rear Dust Shields: Shall be provided.			
Brake Control System: bendix antilock brake system, full vehicle wheel control system 4-channel with automatic traction control			
<b>CHASSIS AND CHASSIS EQUIPMENT</b>			
Wheelbase: wheelbase:187.00, ca 119.90 axle to frame 61.00			
Frame Rails/Reinforcement of Frame: The full length of the frame rails, including front frame extension shall have an effective RBM rating of not less than 2,893,000 lbs. and section modulus of not less than 26.3 in. cu. Note: 3/8" frame rails with 1/4" reinforcement generally exceed the above requirements. If available, a single frame rail is preferred (provided it meets the above ratings), as it avoids problems created by "rust jacking" between reinforced type frame rails. Example of single frame rail dimensions: .44 x 4.13 x 11.81 Please supply the following information about the frame rails utilized for your bid submittal: Type: _____, Rail Dimensions: _____, SM: _____, RBM: _____. Yield: _____.			
Note: Any reinforcement of the frame rails necessary to achieve the above minimum requirements for section modulus and effective RBM, must run the full length of the frame rails; from the rear of the frame all the way through the integral front frame extension.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Front Frame Extension: As an integral part of the frame rail an 18" extension of the frame shall be provided forward of the grill to provide for mounting of a hydraulic pump, HD bumper and a plow standard. Note: Bolt-on or welded-on extensions will NOT be acceptable.			
Note: In the event the chassis OEM uses "notched" frames and/or extensions to accommodate radiators with increased cooling capacity, cheek plate reinforcement must be added.			
Front Tow Hooks: Two (2) frame-mounted hooks			
Frame Fasteners: Grade-8 flange-bolt or huck-bolt type frame fasteners shall be utilized.			
Crossmembers: Steel Crossmembers shall be provided.			
Rear Frame Overhang: Must match the bodybuilder's minimum requirements (nominally 56").			
Frame Treatment, Rear: Shall be a straight cut-off.			
Air Dryer: Shall be a Bendix AD-IP w/heater.			
Air Tank Drain Valve: Shall be the automatic draining type DV2 with heater.			
Trailer Connections: 7 wire plug connection plate and pintle hook.			
Fuel Tank: A temporary (transport) fuel tank shall be provided by chassis mfr. The permanent fuel tank will be provided as part of the bodybuilder package submittal.			
Fuel Lines: Fuel lines shall be SAE-J844 nylon tubing, minimum.			
Back-up Alarm: An electric back-up alarm shall be provided.102 dba			
Battery Box: The battery box shall be a step-mounted design, with lid, and provide a minimum of 24" ground clearance.			
Battery Disconnect: A two (2) post battery disconnect (Flaming River FR1005) shall be provided and mounted at the "rear-facing" side of the battery box in a safe and secure manner. A guard shall be provided so as to prevent accidental disconnection.			
Storage Box: A step-mounted storage box shall be provided, and located on the side "opposite" of the battery box.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Bumper: A bumper shall not be provided by the chassis manufacturer (chassis delete item). It shall be provided as part of the bodybuilder package.			
Chassis Electrical Access: The chassis manufacturer shall provide a "Municipal Wiring Package" that will provide the bodybuilder with electrical access (in the cab) for: L & R Stop/Turn/Tail combination lights, all marker lights, a reverse light circuit, and transmission speed (ground-speed) access. Access shall be clearly noted and wiring schematic available upon request. The bodybuilder will run electrical supply to EOF and provide trailer receptacle.			
<b>CAB AND EXTERIOR ITEMS</b>			
Cab: The cab shall be the largest interior room conventional daycab as is available from each manufacturer.			
Hood: The hood shall be of the fiberglass tilt-type with integral front fenders and fender extensions.			
Grill: Stationary type, chromed, with integral bug screen. A vinyl winter front (if available) is to be included.			
Air Horns: Dual trumpets, mounted under cab if possible.			
Electric Horn: An electric, standard horn shall be provided.			
Mirrors: Shall be "break-away" vocational style mirrors and arms, with separate convex section.			
Mirror Features: Heated mirrors both sides.			
Auxiliary Down-View Mirror: An auxiliary down view mirror over the passenger door shall be provided.			
Tinted Glass: All windows, including rear cab window			
Power Door Locks: Shall be provided, LH and RH.			
Power Windows: The RH door window shall be of the electrically driven power type.			
Grab Handles: Entry assist handles RH/LH shall be provided. Stainless steel if mounted on exterior of cab, or black if mounted inside of cab.			
<b>CAB INTERIOR ITEMS</b>			
Cab Interior Level: The manufacturer's better interior trim level shall be provided. The color shall be a medium gray. The door panels shall have integral armrests.			
Floor Covering: The cab floor covering shall be the rubber or vinyl mat type with foam backing.			
Storage Compartment: A document holder or paper storage compartment shall be provided.			
Cab Climate Control: An integral air conditioner/heater-defroster unit (40,000 BTU min.), shall be provided.			
Heater Hoses: Rubber EDPM or silicone with constant-torque clamps.			
Driver's Seat: A National or Bostrum high-back air-ride driver's seat with inboard mounted armrest shall be provided.			
Passenger Seat: A Toolbox II type, medium-back passenger seat shall be provided.			
Seat Covering Material: All seat inserts and coverings shall be high-durability Cordura-type material. (Cordura: an air-textured, high-tenacity nylon made only by DuPont.)			
Seat Belts: Seat belts shall be provided for all passengers.			
Steering Wheel: Eighteen (18") inch sport wheel.			
Steering Column: Adjustable tilt and telescopic.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Gauge Package: Shall include MPH speedometer and odometer, electric; electric tachometer; electric hour meter, dash mounted; mechanical oil pressure gauge; electric engine-coolant temperature; electric fuel gauge, dash mounted; digital clock; dual air pressure gauge; low air warning, audible and visual; voltmeter.			
Driver Information Display: A screen-type, electronic driver information display, showing safety-related items and indications shall be provided if available.			
Additional Miscellaneous Items: Ashtray, storage compartment, interior sun visors color-keyed left and right, graduated air restriction indicator dash-mounted, transmission temperature warning light and buzzer.			
<b>CHASSIS LIGHTING AND ELECTRICAL PROVISIONS</b>			
Circuit Protection: Shall be manual reset type circuit breakers.			
Chassis Wire Identification: All wiring shall be color coded and numbered down its full length.			
Ground Speed Sensor Access: As previously specified (See Chassis Electrical Access, pg. 6), there shall be a port or connector, inside the cab, from which ground speed sensor data is available for use by the bodybuilder.			
Headlights: Shall be the halogen type, w/daytime running lights.			
Marker Lights: Five (5) amber lights shall be provided. LED-type lights are preferred (please indicate type provided).			
Parking Lights: Shall be integral with the front turn signals.			
Stop and Tail Lights: Shall be dual with integral backup lights.			
Turn Signal Switch: Shall be of the "self-canceling" type.			
<b>RADIO AND MISCELLANEOUS ITEMS</b>			
Radio: Shall be AM/FM Stereo.			
Radio Speakers: Two (2) dual-cone speaker units shall be provided.			
Fleet Radio Connections: Power and ground connections shall be provided.			
Fleet Radio Mount: A dash-mounted hold down plate for Fleet Radio shall be provided.			
Windshield Wipers: Shall be of the single electric motor, intermittent type.			
Wiper Blades: Shall be Arctic or Winter type.			
Windshield Washer Reservoir: A reservoir with a minimum capacity of two (2) gallons shall be provided.			
Keys/Door Locks: Door and ignition keys shall be the same.			
Key type: Each unit ordered should be keyed uniquely.			
Key Quantity: Four (4) keys shall be provided per unit.			
<b>CAB AND CHASSIS PAINT</b>			
Cab Paint: Dupont Imron basecoat/clearcoat paint system shall be used. The color shall be Omaha/Tangier Orange The OEM shall provide paint color chip samples, for verification. Please State paint code: _____.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Note: The chassis builder shall supply the appropriate paint code information to the bodybuilder. The body (when painted) shall match the cab. Two-tone orange trucks will not be acceptable.			
Chassis/Bumper/Hub Color: The chassis, front bumper, rear hitch plate and wheel hubs shall be properly cleaned, prepped, and painted standard black. Quite often this is the first paint that fails, resulting in rusting bumpers and hitch plates. This is unacceptable!			
Disc Wheel/Rim Color: The disc wheels/rims shall be painted standard medium gray.			
<b>FRONT TIRES AND WHEELS</b>			
Steering Tires: The steering tires shall be 315/80R22.5 L, 20-ply XZY-3 MICHELIN heavy service steer position tubeless radials. Tires shall meet or exceed axle and suspension load ratings.			
Front Rims and Wheels: The front rims/wheels shall be 22.5 X 9.00 hub-piloted Accuride steel disc (gray) with a 285mm bolt circle. Disc lock wheel lugs part number NMF-2090-M-GEO. No exceptions			
Front Hubs: The front hubs shall be steel, hub-piloted with a bolt circle of 285.75mm.			
Front Brake Drums: The front drums shall be cast iron.			
Spare Front Wheel: A mounted spare (steering) wheel & tire of the size and specifications listed above shall be provided for each unit ordered.			
<b>REAR TIRES AND WHEELS</b>			
Rear Tires: The rear tires shall be 11R22.5 H, 16-ply XDE M/S MICHELIN drive position tubeless radials. Tires shall meet or exceed axle and suspension load ratings.			
Rear Rims/Wheels: The rear rims/wheels shall be 22.5 X 8.25 hub-piloted Accuride steel disc (gray) with a 285mm bolt circle. Disc lock wheel lugs part number NMF-2090-M-GEO. No exceptions			
Rear Hubs: The rear hubs shall be steel, hub-piloted with a bolt circle of 285.75mm.			
Rear Brake Drums: The rear drums shall be cast-iron.			
Spare Rear Wheel: A mounted spare (drive) wheel & tire of the size and specifications listed above shall be provided for each unit ordered.			
<b>SAFETY RATING AND EQUIPMENT</b>			
Note: The completed work truck shall meet all current State and Federal vehicle codes and current MIOSHA standards.			
Fire Suppression Equipment: A five (5) lb. Dry-type ABC-rated rechargeable fire extinguisher shall be provided, and mounted inside the cab readily accessible from the ground through the driver's door.			
Safety Equipment: A kit containing three (3) triangular reflectors, along with three 20-minute red road flares shall be mounted in approved bracket or storage box inside the cab, readily accessible from the ground through the driver's door.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
<b>ADDITIONAL ITEMS</b>			
<p>Software Packages / Manuals: One (1) each of the following service, repair and parts manuals shall be provided for each unit ordered. One (1) additional of the following parts manuals shall be provided for the MCDR stockroom:</p> <ul style="list-style-type: none"> <li>a) Engine</li> <li>b) Allison 4500 RDS Transmission</li> <li>c) Truck chassis and associated components</li> <li>d) Body and associated equipment including the front mounted snowplow, underbody scraper, ground speed controller, salt spreader and pre-wet system.</li> </ul> <p>Note: CD-ROM disc versions of the above manuals may be substituted where applicable. Failure to supply any of the above with delivery of the first unit may result in the penalty clause of Warranty Documentation Provisions being invoked.</p>			
<p>In addition to the above reference documents, the following shall be provided for each unit ordered:</p> <ul style="list-style-type: none"> <li>a) One (1) line-setting sheet</li> <li>b) One (1) listing of replacement belt and filter numbers</li> <li>c) One (1) electrical schematic of truck wiring</li> </ul>			
<p>Paper Pilot Review: Upon award of the bid, the successful bidder shall contact the MCDR Vehicle Maintenance Foreman (Greg Zukowski 586-791-3117) to schedule a pre-build meeting. A paper pilot review of the entire unit shall be conducted prior to the build of the first chassis and shall include at least one (1) representative from each of the following:</p> <ul style="list-style-type: none"> <li>a) Chassis manufacturers factory engineer (generally via speakerphone)</li> <li>b) Chassis manufacturers dealer representative</li> <li>c) Bodybuilder representative and associates of their choice</li> <li>d) Macomb County Department of Roads</li> </ul> <p>The Paper Pilot Review shall be held within 15 business days following award of the bid and issuance of the purchase order. The review shall be held at a mutually agreeable location, with good speakerphone capabilities.</p>			
<b>WARRANTY DOCUMENTATION PROVISIONS</b>			
<p>General Terms and Conditions: Warranty certificates or letters on all applicable and requested warranty items shall be provided to the end user upon delivery of the first chassis unit. All warranties shall start from the in-service date (of the completed vehicle) with the Macomb County Department of Roads.</p> <p>Penalty Clause: Failure to provide any of the above documentation at the time of delivery shall be grounds for withholding three thousand (\$3,000.00) dollars of the monies due for payment of the unit, until such time as the requested documentation is provided.</p>			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
<p>Engine Warranty: The engine shall have as a minimum a five (5) year, three hundred thousand (300,000) mile warranty from the manufacturer of the engine; the first three (3) year, three hundred thousand (300,000) miles of which shall be complete coverage with no deductibles, and the remaining two (2) years of which shall be major components</p>			
<p>Allison Transmission Warranty: As previously specified, the transmission shall have a total of five (5) years Allison Vocational warranty coverage, standard and ETC combined.</p>			
<p>Truck Chassis Warranty: All truck components shall have as a minimum a twelve (12) month full coverage warranty. Pricing for optional extended warranties. A copy of the truck manufactures warranty certificate shall be included as part of the bid package as applicable to the chassis product being bid. The bidder upon request shall provide further clarification of warranty provisions in writing.</p>			
<p>Bodybuilder Warranty: The bodybuilder shall provide a warranty letter, explaining the warranty terms and provisions for the equipment they propose to install and the work they propose to do. Wiring Diagrams</p>			
<p>Additional Warranty Provisions: A four (4) year parts and labor warranty shall be provided on the following items:</p> <ul style="list-style-type: none"> <li>a) Engine Cooler (Radiator) and Turbo Pre-cooler</li> <li>b) Transmission Cooler</li> <li>c) Air Conditioning Condenser and Evaporator</li> </ul>			

## BODYBUILDER SPECIFICATIONS

### CENTRAL HYDRAULIC SYSTEM SPECIFICATIONS

#### General Description

This specification shall describe a hydraulic system of the preferred type and design to operate the equipment on the vehicle. All manufacturers' names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
<b>Hydraulic System</b>			
The Hydraulic pump will be driven live off of the engine's crankshaft through an automotive style driveshaft.			
The driveshaft will consist of a shaft assembly, flange yoke, end yoke, and all necessary parts for connecting the hydraulic pump to the PTO adapter supplied by the chassis manufacturer.			
The driveline shall be Spicer 1350 series assembled with proper angle and phasing for optimum operation.			
The hydraulic pump shall be mounted to a 6" structural channel crossmember that shall be bolted, not welded, to the truck front frame extension, for easy serviceability.			
<b>Hoses and Fittings</b>			
Hydraulic hoses with JIC fittings shall be used.			
Black iron pipe and elbows are not acceptable.			
All high-pressure lines shall use o-ring type fittings; with swivel fittings on both ends, pipe thread not acceptable.			
All high-pressure lines shall have a minimum working pressure rating, of 3,000 psi.			
All hoses and control cables shall be securely fastened with rubber-coated steel clamps, and shall be protected with rubber grommets wherever they pass over sharp edges.			
All quick couplers shall be stainless steel, poppet style, with dust covers. No exception.			
Provide all pipe fittings, hoses, and any other necessary attachments to complete the unit for operation. System is to be filled with 10W hydraulic oil meeting grade AW32 specifications. System pressure shall be set and system tested. Installation is to include black painting of pump, valves, mounting places and hose clamps, etc.			
<b>Pump</b>			
The hydraulic pump will be a variable displacement, axial piston pump of al cast iron construction.			
The pump will feature a load sensing control with an internal bleed down compensator and separate screw type adjustments for main and stand by pressures.			
The pump shall also feature a solenoid positive pump shut-off with relay connected to the low-oil switch, and an in-cab momentary override switch.			
The pump will have a displacement of at least 4.33 cubic inches/revolution and be capable of operation up to 3500 psi or greater.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
The pump will be equipped with a case drain line that will run directly to tank without passing through any filters.			
The pump will be equipped with side facing, flange type porting.			
Minimum suction line size shall be 2.00 inches.			
The pump and main control valve will be made by the same manufacturer to insure optimum system compatibility. Pump to be Sauer Danfoss frl090 piston pump, Sauer Danfoss pvg32 load sense valve			
Hydraulic Valve			
The hydraulic valve will be a sectional, spool type valve of cast iron construction with a nominal flow rating of 30 gpm and an inlet/work port pressure drop not to exceed 150 psi.			
The valve will feature individual pressure and flow compensation for each section and a field replaceable shuttle network that is accessible without valve disassembly.			
The valve must allow for multiple operations without any interruption of any function, regardless of pump flow.			
For improved metering an adjustable flow compensator will be provided on each section.			
Each section shall have momentary and maintainable manual overrides.			
Sections will be provided for the operation of:  a) Double acting hoist b) Front snow plow with power angling c) Underbody scraper tilt and swing d) Combination insert			
The spreader/conveyor valve section will have a 15-gallon spool. The spinner valve section will have a 7-gallon spool.			
The main valve will have shim adjustable port reliefs as follows: <ul style="list-style-type: none"> <li>• Blade down pressure – 500 psi.</li> <li>• Blade swing (both ways) – 1200 psi.</li> <li>• Dump hoist down – 500 psi.</li> </ul> Manufacturer may recommend crossover relief.			
The valve shall be mounted outside the truck frame in a sealed protective easy to service enclosure of seven-(7) gauge steel with removable, gasketed lid and JIC type bulkhead connections. A pressure test port and gauge hose assembly will be included.			
Stainless steel valve enclosure			
Controls			
The control valve will be operated via sealed joystick control. Freedom ACS control panel, single stick can system with armrest. All wiring will be covered, away from heat.			
Hydraulic and Fuel Tanks			
A separate diesel tank and hydraulic oil reservoir shall be mounted behind the back of the cab in a heavy-duty cradle, with steel straps to secure the tanks. The tanks shall be 7-ga. steel.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
The diesel tank shall have a capacity of 100 gallons. It shall be located on the driver's side of truck, painted green, and marked as diesel fuel. The tank shall be baffled, have a brass threaded fill cap, and a sending unit to match the truck type.			
The diesel tank suction line shall include a brass ball shut off valve at the tank, secured in an open position to prevent accidental closing. This particular requirement is a result of vehicle accidents, where fuel filters were knocked off or lines severed and MCDR mechanics were unable to quickly shut off the fuel leak.			
The hydraulic tank shall have a capacity of 40 gallons. It shall be located next to the fuel tank, painted yellow, and plainly marked as hydraulic oil. It is to have a filler cap that is non-vented. Filler neck to have a 4" screened basket. Reservoir shall incorporate a vent system designed to prevent oil spillage in the event of a roll over.			
The hydraulic tank suction line to be minimum SAE100R4 2" I.D. Suction line to have two-inch (2") brass ball shut off at tank, secured in an open position to prevent accidental closing. The return port shall be 1.25".			
Hydraulic oil reservoir shall have a 5" combination temperature/sight gauge. (Visibility of gauge, not to be obstructed.) Included shall be a top mounted oil level sensor extending 30" into the tank, brass tube construction, with adjustable level to activate a cab-mounted light and buzzer if the oil level drops below a safe level.			
Filtration			
A cartridge-type return filter mounted to the top of the reservoir, with a drop tube extending 2/3 down into the tank will protect the system. The filter will feature a 10-micron element, 25-psi bypass, dual inlet ports with o-ring threads and a steel element can. Filter element will be a water removable type. Zinga model, #RF-1215-S-25-MP-1 with RE409-10 element. One additional element will be provided, with each vehicle, at the time of delivery.			

## ELECTRICAL SPECIFICATIONS

### General Description

This specification shall describe the electrical bodybuilder requirements with regard to lighting, switches and wiring not covered elsewhere in the bid specifications package. All manufacturer's names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
<b>Cab Lighting</b>			
Beacon: Code 3 PSE, Inc., Model LP6105HS with amber lens shall be mounted on the cab roof and power supplied by a switch in the master control panel. The beacon assembly and wiring shall be sealed to prevent leakage of water into the cab.			
<b>Snow Plow Lights</b>			
Snowplow lights (low profile Dominion Auto # 72-5531) shall be mounted to the truck hood/fenders on custom brackets designed not to stress the fiberglass - and high enough so as to be visible over the snow plow, when in the raised position.			
A switch shall be provided in the master control panel for operation of the snowplow lights. The plow lights shall be wired into the master control panel with common color-coding as provided for by the light manufacturer.			
All connections shall be Weather Pak type, sealed connections. All wiring shall be continuous once it leaves the protected environment of the cab. There shall be no splicing.			
<b>Body Lighting</b>			
The amber warning lights, stop/turn/tail lights and backup lights shall be flush mounted with rubber grommets in a stainless steel wedge-shaped protective box, solid welded to the outside rear corner posts of the body.			
The amber warning lights shall be located in the upper and lower most positions in the wedge-shaped protective boxes with the stop/turn/tail and backup lamps occupying the middle positions, stop/turn/tail being above the backup lights			
The four (4) amber oval strobe heads, model # 3920 from Star Warning Systems, shall be mounted two (2) per side flashing simultaneously high left/lower right, to high right/lower left.			
Flashing of amber strobe lights is to be controlled through a Star Pac RP330Q, 75W, quad-flash power supply located in the cab of the vehicle and powered by a switch in the master control panel.			
The amber warning light wiring is to be continuous from the power supply located in the cab to the strobe heads located in the light boxes at the rear of the body. The wiring shall be Betts product 14 ga., 6-conductor trailer cable. A separate conductor cable shall be used for right and left light assemblies. The wiring shall be connected at the power supply (in the vehicle cab) with the appropriate matching connectors and at the strobe heads (in the wedge shaped boxes) with Weather Pak connectors. There shall be no splicing in between.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
The stop/turn/tail (STT) light assemblies shall be Trucklite brand of oval type, with polycarbonate lens and sealed housing, rubber grommet mounted.			
The backup light assemblies shall be Trucklite brand of oval type with a white polycarbonate lens and sealed housing, rubber grommet mounted.			
The STT, body markers, spreader light, and backup light wiring shall be continuous from the junction box to the light assemblies. The wiring shall be Betts product 14 ga., 6-conductor trailer cable. Each wire (including the strobe wiring) shall be individually numbered, and a wiring diagram showing the numbered circuits shall be supplied for each truck. A nylon mesh wrapping for protection shall enclose the wiring harness. The wiring shall connect at the in cab junction box, located at the rear wall of the cab. A rubber grommet shall protect the cable where it passes through the cab sheet metal. The wiring shall enter the light box from inside the body corner post, with a rubber grommet to protect the cable where it passes through the body. A separate conductor cable shall be used for right and left light assemblies. The wiring shall be connected at the light assemblies with Weather Pak connectors (3) three			
Sander Light: One (1) rubber housed sealed beam light, Signal Stat # 620 w/housing and with #4411 flood lamp, shall be mounted at the lower left rear corner of the body corner post so as to illuminate the salt spread pattern. One fender light on each side of truck to illuminate underbody assembly. Power shall be supplied via a switch in the master control panel, and fed to that light by means of one of the unused conductors in the conductor cable that feeds power for the left rear STT light.			
All wiring is to be continuous once it leaves the protected environment of the cab (no splicing).			
<b>Switches</b>			
All auxiliary functions controlled by electrical switches will be centrally located in the cab of the truck in a master control panel.			
The master control panel shall be visible to the operator at a glance and be located to the driver's right within easy reach with the operator seated. It shall be installed so as not to interfere or conflict with other controls or functions in the cab.			
The panel shall contain six (6) lighted rocker switches, three (3) warning lights and one (1) loud audible alarm.			
Each of the switches shall be labeled with the exact description of the function controlled.			
Each switch shall include a magnetic circuit breaker for safety. The circuit breakers shall not reset unless the overload has been corrected.			
Label backlighting shall be provided with two levels of intensity. The low level lights shall be activated when the vehicle lights or ignition switch is turned on. The high level shall be activated when the individual switch is turned on. The lights shall be the solid-state type and have a 100,000-hour life span.			
The lighted rocker switches shall control the following functions: Main power (on/off), beacon, amber warning lights (stobes), plow lights, sander light, and one spare.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
One warning light shall indicate body over height (12'), and be so labeled.			
One warning light shall indicate a low level in the pre-wet tank, and be so labeled.			
One warning light, along with the loud audible alarm shall indicate low hydraulic oil level, and be so labeled.			
The master control panel shall function through a power distribution box consisting of NEMA 12 series enclosure, in cab mounted, readily accessible by mechanics.			
This panel shall obtain power directly from the truck batteries via an 8-gage wire from an 80-amp/100% duty cycle solenoid (Cole Hersey # 24106) protected by a manual reset 60-amp circuit breaker. The ignition switch shall energize this solenoid.			
In addition to housing the above stated switches, the master control panel console shall also house the spreader controller described later in these specifications.			
Consideration shall be given to the design, construction and location of the control console, and to its impact on future installation of GPS components. (Discuss with MCDR Vehicle Maintenance Forman Greg Zukowski 586 791-3117).			
<b>Wiring</b>			
Trailer Receptacle: Corrosion resistant diecast metal 7pin receptacle; wiring shall be continuous from the (in cab) junction box to the trailer receptacle.			
An electrical trailer brake controller shall be installed in a suitable location in the vehicle cab.			
If not previously specified above; all wiring is to be color-coded and a minimum of 16-gage.			
All wiring from the control panel is to be continuous once it leaves the protected environment of the cab (no splicing).			
All wiring shall be in a sealed loom and securely fastened.			
All component connections shall be made with Weather Pak connectors and sealed to prevent corrosive capillary action.			
All electronics shall be designed to work together as a unit. All literature must contain information on installation and operation of the units. Factory trained local support for installation, operation and troubleshooting of the electronics is mandatory.			
<b>Pavement/Air Temperature Measuring Unit</b>			
Installation shall include a Sprague Controls, Inc., RoadWatch® Temperature Indicating System.			
Installation shall include mounting of the sensor head, on the Driver's side mirror/bracket and proper routing of cable. Grommet(s) shall be used wherever the cable passes through body panels.			

**HEAVY DUTY UNDERBODY SCRAPER**  
**General Description**

This specification shall describe a heavy-duty underbody scraper to be mounted on a road maintenance truck. It shall be used for snow and ice removal operations and gravel road/gravel shoulder maintenance operations. All manufacturer names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
The Underbody Scraper shall be a Henderson 10: model ub-10, or approved equal. Specify make: _____ Specify model: _____			
<b>Moldboard</b>			
20" high X 1" thick X 10' long			
Replaceable moldboard curb shoes, both ends.			
<b>Cutting Edge</b>			
Two (2) sections – 5/8" X 8" X 60" with carbide hardened edges.			
<b>Trip Mechanism</b>			
Moldboard cushioned by two (2) heavy duty, totally enclosed compression springs.			
Springs and lift cylinders are mounted within canisters.			
Cutout on top of canisters for easy access to fittings.			
<b>Lift Cylinders</b>			
Moldboard actuated by two (2) double acting cylinders			
4" O.D. tubes with 2" nitrated piston rods with 8" stroke.			
Relief valve set at 500 PSI on down pressure side.			
Cylinders are attached to 3/4" thick steel plates which are bolted to the hangerboard.			
<b>Hangerboard</b>			
Manufactured from 5/8" thick formed steel plate and reinforced by 1/2" X 8" flat stock.			
<b>Hinge Assembly</b>			
Shaft, 2-1/2" O.D. X 96" long.			
Shaft supported by four (4) hinges attached to moldboard. Outside hinges to include semi-circle gusset for support.			
<b>Circle Assembly</b>			
1" thick – one piece circle			
Two (2) 20-1/2" X 9-1/2" X 1" thick hold down blocks.			
3/8" thick tenelene wear plates between the circle and hold down blocks.			
Circle rotation utilizes a 5" pivot pin held in place by three (3) 3/4" X 3-1/2" bolts.			
Pivot point reinforced by 6-1/2" O.D. X 1-1/2" thick bushing.			
3/4" thick formed steel chassis mounting brackets.			
<b>Reversing Mechanism</b>			
Adjustable up to 45 degrees left and right			
Two (2) double acting cylinders with 4" outside diameter			
2" nitrated piston rods with 12-1/2" stroke			
Cylinders attach to circle through 2" diameter pins, front and rear.			
Angle cylinders protected by cushion valve			
All cylinders must include nitrated shafts, which incorporate a Q-P-Q (quench/polish/quench) process, and include a two-year warranty.			

**CROSS-MEMBERLESS TYPE DUMP BODY  
WITH TELESCOPIC HOIST  
(For Tandem-Axle Truck)**

**General Description**

This specification shall describe a Crossmemberless Type Dump Body with Telescopic Hoist. All manufacturer names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening. Bidders must submit their bid on a unit that meets or exceeds these specifications, and must submit along with their bid, complete specifications on the unit they propose to furnish.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Henderson MK-E crossmemberless type dump body, or approved equal. Specify Make:_____ Specify Model:_____			
The body and hoist must be part of a standard product line, as described in published company literature. This is to ensure engineering integrity and parts availability.			
<b>Dimensions</b>			
Capacity: Shall be 10 yd <sup>3</sup> struck			
Inside Length: 13'			
Inside Width: Inside width to be 84"			
Side Height: 36"			
Tailgate Height: 44"			
Headsheet Height: 58"			
<b>Sides &amp; Headsheet</b>			
One-piece sides & headsheet to be 304 (or better grade) stainless steel.			
Side panels must wrap under floor 10-1/2" for added strength.			
10 ga. boxed top rail, horizontal side brace, and bottom rub rail are all seamless and sloped outward.			
Horizontal side brace shall be full box section. Brace formed into side not acceptable.			
One-piece full depth tapered front corner posts, one-piece to floor for strength, with 4" sideboard pockets.			
304 (or better grade) stainless steel 4-3/4" X 12" full depth rear corner posts are tied to an 8" structural channel rear apron. This joint is further reinforced with a 1/4" plate which helps prevent flexing in this critical area and strengthens the latch assembly.			
All welding is to be continuous, for strength and corrosion resistance. Skip welding is not acceptable.			
Formed-in doghouse to extend a maximum of 13" into the body.			
The hoist cylinder shall not extend in front of body when lowered. This is to minimize overall truck length and turning radius.			
<b>Floor</b>			
One-piece seamless 3/16" AR400 steel (200,000 psi tensile strength). Brinell hardness of 360 min. – 444 max.			
Seamless floor and side sheets are to be joined by a continuous weld. 4" floor to side radius of 10 gauge 304 (or better grade) stainless.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Unibody design (no cross members); the purpose of which is to prevent washboarding and cracking of floor, and for easy cleaning			
One-piece 8" X #13.0 I-beam long sills			
Maximum 8" mounting height for lower center of gravity for safety			
Tailgate			
10 gauge tailgate sheet, 304 (or better grade) stainless steel			
Full perimeter boxing with all horizontal edges sloped outward.			
Shall have two (2), horizontal and two (2) vertical 7 gauge sloped braces flush with the perimeter boxing.			
Flush mount, 1/2" flame cut tailgate pivots.			
Heavy duty offset hinge plates, 1" flame cut.			
3/4" latch hooks with 3/8" latch plates			
1-1/4" Hot Rolled upper and lower pins			
Pivot points include stainless steel bushings to reduce seizing.			
Air trip "pancake-type tailgate release with spring over center latch utilizing an air brake chamber for reliability			
Tailgate must remain locked even if air pressure is lost.			
Hoist			
Single cylinder, front trunnion mounted; Lift point must be at the bottom of the body for stability.			
Trunnion lift point must be by an oscillating collar to reduce cylinder side loading, and premature seal wear.			
3 stage cylinder, 120" stroke with a 5.5" min first stage diameter			
N.T.E.A. class 80, 29.4 ton capacity			
Largest diameter stage must be at the bottom for stability. Inverted cylinder is not acceptable.			
First stage of hoist must be double acting (power down) to facilitate lowering over center body.			
Cylinder must utilize u-cup type seals. Adjustable packing nuts are not acceptable. Cylinder must utilize bronze pistons and glands. Cylinder surface must be immersed in oil when retracted.			
Wear and corrosion resistant type Nitrited cylinder tubes			
Minimum 2 year cylinder warranty			
Connecting pivots to have either greasable brass bushings, or replaceable greaseless composite bushings.			
One-piece modular cradle to incorporate body props, body guides, and hoist bushings			
If composite bushings are used, "stops" shall be incorporated to insure composite bushings do not work their way out of the cradles.			
Sub Frame & Rear Hinge Assembly			
Hinges must hold body long sills over truck frame with body raised, and truck moving.			
Nitrited 2" diameter 1045 C.R. hinge pins connecting to 2-1/2" solid hinge blocks using replaceable greaseless composite bushings for a minimal pin-to-bushing clearance			
6" X 8" X 1/2" structural angle hinge.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Miscellaneous			
22" X 86X10", 304 (or better grade), stainless steel cab shield			
Tapered, 304 (or better grade,) stainless steel sideboards			
Welded to the side of the doghouse and bridging across the top with a piece of 1" bar stock and 3/8" flat stock gusset, form a ring - to facilitate lifting of the box if the hydraulic system is disabled.			
Welded to each outside front corner of the dump body shall be a ladder assembly; Stainless steel fold down ladder the first step being 28" from the ground, with each step thereafter having 12" spacing to the top of the box.			
The above ladder assemblies shall be a minimum of 15" wide. Material shall be a least 3/4" round reinforcement rod with crosshatch non-slip pattern. Angle iron bracing from bottom of ladder to underside of bed is necessary for proper support.			
Affixed inside of box opposite the outside ladder shall be 2 steps at 1/3 intervals made of 3/4" ramrod and angle braced for support.			
Mud flaps in front of and behind rear tires. No advertising is allowed.			
Tarp System			
Rollrite 3-spring automatic tarp system with aluminum arms			
20: leno-weave mesh tarp			

**COMBINATION SPREADER BODIE WITH PRE-WETTING AND ANTI ICING CAPABILITIES**

**General Description**

This specification shall describe a hydraulically driven Combination insert, to be used on a road maintenance truck and used for enhancement of snow and ice removal operations. All manufacturer names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
COMBINATION INSERT			
HENDERSON 12 TASK FORCE . COMBINATION INSERT			
The system will be controlled by freedom acs control in cab, for salt control, pre wetting and ant icing up to 3 lanes			
BODY			
Sides, ends and supports 10 ga ,304 stainless steel, continuous seam welded from inside			
56" high sides , side slope is 45 deg with front slope 18 deg and 9 deg rear slope			
800 gallon liquid capacity			
Dual auger conveyor			
Rear discharge pintle type conveyor chain.			
Slurry option			
Stainless steel leg kit Stainless steel ladder at rear Direct cast poly spinner c/w valve and control Wheel guide kit Ratchet strap hold downs Tailgate latch mount Top grate screens Hose kit with quick couplers Stainless steel bumper			

**FRONT PLOW,  
(With Bumper and Trailer Hitch)**

**General Description**

This specification shall describe the preferred snow plow hitch, vehicle front bumper, and vehicle trailer hitch. All manufacturer names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Henderson rsp-10 10" reversible plow			
36" high moldboard.			
Integral shield moldboard.			
10 ga 304 stainless moldboard.			
1"x 6" cast skid shoes with screwjack adjustment			
Winter curbguard w/carbide both sides 36" plastic coated steel blade guides			
<b>Bumper</b>			
12" structural channel front bumper, flared back approximately 18" from each end to within 4" of front fenders so as to protect truck fenders.			
The open area between the bumper and fender shall be closed with 1/8" non-slip tread plate and properly braced. The tread plate cover shall be removable.			
The bumper and hitch assembly shall be bolted to the truck frame, and then welded. These methods shall be incorporated to preclude the tilting downward of the bumper and/or hitch assembly because of continued snowplowing operations.			
<b>Trailer Hitch</b>			
A 3/4" back plate shall be installed in between the rear frame rails, welded and gusseted for support of a (Buyers PH-15) pintle hitch.			
The hitch plate shall be welded and gusseted to support a tongue weight of 6,000 lb. and a trailer weight of 30,000 lb.			
The (Buyers PH-15) pintle hitch shall be mounted to the hitch plate with grade 8 bolts and Stover nuts, and located 21" from level ground to rest point on the pintle hook.			
Two "D" safety chain eyes of 3/4" role stock steel shall be located to each side of the pintle hitch.			
The hitch and pintle hook when mounted shall not interfere with the spreader and spinner assembly.			
The trailer hitch and hitch plate shall be painted black.			

## SPREADER CONTROL

### General Description

This specification shall describe the minimum requirements for a microprocessor based, ground speed spreader control system. All manufacturer names and part numbers are included for descriptive purposes. If alternate types and/or styles of systems are to be bid it will be the bidder's responsibility to obtain approval before the bid opening.

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
There will be a programmable microprocessor based, ground speed spreader controller mounted in the cab of the vehicle, for operation of the spreader attachments.			
The spreader controller shall be a freedom acs controller .joystick controlled .armrest and mounting base.			
The controller will provide for accurate spreading of granular materials in open loop or manual operation, and shall serve to activate the combination insert.			
The controller must be capable of operating most current pulse width modulated valves.			
Calibration will be accomplished "on screen" without the need for external devices by using the panel controls.			
The controller shall operate on standard vehicle voltage and shall be GPS ready (without the need of additional/external sensors).			
The controller will be back lit and have a multi line, dot matrix, graphic back lit display.			
The display will show the current material type being spread, miles per hour and the desired application rate for both granular and liquid.			
The display will also show miles traveled and pounds delivered or show day, date and time.			
The display will also show the operator the number of lanes being spread during closed loop spinner operation. All of the above will be visible during normal operation.			
The display shall also alert the operator to active blast operation, ground speed interrupt, liquid application, or any errors in the input signals detected by the microprocessor self diagnostic system. Errors to be displayed in plain English, the use of numeric error codes are not acceptable.			
The controller will be capable of both automatic and manual modes. The supervisor can lock out manual mode.			
Full bandwidth potentiometers will control rates.			
A covered RS-232 port will be located on the front panel for connection to a GPS system, data retrieval, and calibration if desired.			
Data retrievable shall include information such as truck ID, recent and annual information including: pounds total, miles total, pounds per mile average, percent miles in auto mode, average mile per hour and maximum miles per hour.			

COMPLIES WITH SPECIFICATIONS?	YES	NO	EXPLAIN DEVIATIONS
Stored calibration information will be available such as: all equipment settings, all calibration settings, all material information and option information.			
The controller will provide for four material types. Information such as material name, blast duration, blast parameters, and maximum application rate will be stored with each material type.			
A spot spreading or "pass" switch will be provided so spreading can be started and stopped without turning control on and off.			
While in automatic spreader operation, when the vehicle stops the spreader will stop. Upon vehicle movement the spreader will start to spread instantaneously.			
The controller will be mounted in a way to provide the best operator usability and safe vehicle operation.			
All sensors, cables, external devices or interfaces will be provided to make the system complete and usable. All electrical wiring for spreader system shall be thermoplastic elastomer (TPE), rated for IP-68 minimum There shall be no splices in the wiring.			
Harness System: Shall be designed to resist corrosion – even after 500 hours in a 35C salt spray. Cable ends to be molded to the cable to seal out moisture. The connectors shall be of a locking style (similar to an MIL spec connector), each with three separate sealing points; the lock-ring, a raised portion of molded plastic around each pin, and a viton o-ring to seal the entire connector. A detented lock-ring is also to be used to insure that a locked position is maintained. The cable jacket to consist of a thermoplastic elastomer, molded to the connectors, to provide exceptional cold weather flexibility.			
<p>Vendor supplying Ground Speed Spreader Controller will provide training for the operators and mechanics that will be using or maintaining this equipment, within two weeks following the delivery of these units.</p> <p>The vendor shall also supply training literature and/or videotapes explaining the operation, programming, and calibration of the spreader controller, for future reference.</p>			