



THE CITY OF  
**MT. PLEASANT**, MICHIGAN

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**CITY HALL**

320 W. Broadway St. • 48858-2447  
(989) 779-5300  
(989) 773-4691 fax

**PUBLIC SAFETY**

804 E. High St. • 48858-3599  
(989) 779-5100  
(989) 773-4020 fax

**PUBLIC WORKS**

1303 N. Franklin St. • 48858-4682  
(989) 779-5401  
(989) 772-6250 fax

**NOTICE TO BIDDERS**

***TWO (2) 2014 CHASSIS-MOUNTED SPREADER & UNDERBODY SCRAPER SYSTEMS WITH FRONT FLOW HITCH***

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The City of Mt. Pleasant, Michigan, is requesting sealed bids at the Office of the City Clerk, City Hall, 320 W Broadway Street, Mt. Pleasant, Michigan 48858, until 1:30 p.m. (EST), on Tuesday, September 24<sup>th</sup>, 2013, at which time and place the bids will be publicly opened and read. All bids shall be submitted in a sealed envelope, plainly marked "CHASSIS-MOUNTED SPREADER & UNDERBODY SCRAPER SYSTEMS W/FRT PLOW HITCH – SEPT 24, 2013."

Proposals are solicited on a lump sum basis, for the following items:

***TWO (2) 2014 CHASSIS-MOUNTED SPREADER & UNDERBODY SCRAPER SYSTEMS WITH FRONT FLOW HITCH***

To view and download complete specifications at no charge, visit the City of Mt Pleasant website at [www.mt-pleasant.org](http://www.mt-pleasant.org) and navigate to the Bids and Quotes page.

The City of Mt. Pleasant reserves the right to accept or reject any or all bids, to waive any irregularities in the bids, and to select the bid considered most advantageous to the city.

Dated: September 16, 2013

Robert Murphy  
Street Superintendent  
(989) 779-5409

Jeremy Howard  
City Clerk

City of Mt Pleasant, Michigan  
**INSTRUCTIONS TO BIDDERS**

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1. **Proposals**

Proposals must be made upon the forms provided with the Bid amount both written and shown in figures, and all other data required submitted.

The Proposal, bound together with all Proposal Documents, must be enclosed in a sealed envelope and marked as specified in the Notice to Bidders for such bid. The name and address of the Bidder must be clearly indicated and bid must be received by the City Clerk, City Hall, 320 W Broadway Street, Mt Pleasant, Michigan, 48858, no later than the time and date specified in the Notice to Bidders. At such specified time, proposals shall be publicly opened and read aloud.

2. **Basis of Proposals**

Proposals are solicited on the basis of unit price(s) and/or lump sum(s), as specified on the Proposal form.

The City of Mt Pleasant, also referred to as "Owner", reserves the right to accept or reject any or all bids, to waive any irregularities in the bids, and to select the bid considered most advantageous to the city.

3. **Comparison of Bids**

In comparing bids, **consideration shall be given to the time proposed for completion of the Contract**, price differentials, alternate Proposals for items listed in the Proposal (if applicable), and any other pertinent factors. The Owner reserves the right to make an award to the Bidder whose proposal is deemed to be in the best interest of the Owner.

4. **Time**

Time is of the essence in the performance of the Contract, and each Bidder, by submitting a Proposal, certifies his acceptance of the time allowed by the contract.

5. **Interpretation of Bidders**

If any Bidder is in doubt as to the true meaning of any part of the Plans, Specifications or any Contract Document, he/she may submit to the Street Superintendent or designee, a written request for an interpretation thereof. Any interpretation made in response to such query shall be made only by Addendum, duly issued, and a copy of such Addendum shall be mailed or duly delivered to each prospective Bidder. The Owner shall not be responsible for any other explanation or interpretation of the Contract Documents.

6. **Execution of Bid Proposal**

A Bid Proposal that is not signed by the individual making it should have attached thereto a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the person for whom it is signed.

A Bid Proposal that is signed by a partnership shall be signed by all of the partners or by an Attorney-in-Fact. If signed by an Attorney-in-Fact, there should be attached to the Bid, a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the partnership and such Power of Attorney shall be signed by all partners of the partnership.

A Bid Proposal, which is signed for a corporation should have the correct corporate name thereof and the signature of the President, or other authorized officer(s) of the corporation, manually written below the corporate name and on the line indicating "By:\_\_\_\_\_". If an officer other than the President of the corporation manually signs such Bid Proposal, a certified copy of the Resolution of the Board of Directors evidencing the authority of such officer(s) to sign the Bid Proposal should be attached thereto. Such Bid Proposal should also bear the attested signature of the Secretary of the corporation and an impression of the corporate seal.

7. **Qualification of Bidders**

It is the intent of the Owner to award the Contract to a Bidder fully capable, both financially and with regard to experience, to supply all vehicles, equipment or work in a satisfactory and timely manner. Evidence of such competency must be furnished, if requested, listing references or similar projects which the Bidder has satisfactorily undertaken and completed.

8. **Delivery**

The city shall make arrangements to deliver the cab and chassis to the successful bidder for installation of all equipment. Upon completion, the city shall be notified and shall pick up the completed truck from the successful bidder.

**PROPOSAL  
FOR  
TWO (2) 2014 CHASSIS-MOUNTED SPREADER & UNDERBODY SCRAPER  
SYSTEMS WITH FRONT PLOW HITCH**

**TO:** Clerk's Office  
City of Mt Pleasant  
320 W Broadway Street  
Mt. Pleasant, MI 48858

**BID DATE:** SEPTEMBER 24, 2013  
**TIME:** 1:30 p.m.

In accordance with the specifications and other bid requirements heretofore provided, the undersigned agrees to provide the below listed bid items at the price(s) set forth below. Bid is to include complete installation of spreaders, underbody scraper blades and front plow hitches.

**This is a firm bid and not subject to withdrawal or change for a period of thirty (30) days.**

|   |          |
|---|----------|
| Two (2) Chassis-mounted V-box Spreaders | \$ _____ |
| Two (2) Underbody Scrapers              | \$ _____ |
| Two (2) Front Plow Hitches              | \$ _____ |

**TOTAL BID PRICE \$ \_\_\_\_\_**  
**(IN FIGURES)**

\_\_\_\_\_ Dollars and \_\_\_\_\_/Cents  
**(WRITTEN FIGURE)**

**DELIVERY DATE: \_\_\_\_\_, 2013**

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

TELEPHONE \_\_\_\_\_ DATE \_\_\_\_\_

AUTHORIZED SIGNATURE \_\_\_\_\_

PRINT OR TYPE NAME & TITLE \_\_\_\_\_

## GENERAL SPECIFICATIONS FOR TRUCKS AND EQUIPMENT

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The items listed below are to be supplied on all trucks, even though they may be optional with the manufacturer. They have, therefore, not been included in the individual specifications but are to be furnished on all vehicles.

- 1) All trucks are to be equipped with right-hand and left-hand OUTSIDE REARVIEW MIRRORS to comply with Michigan laws. All trucks up to and including 10,000 GVW shall be equipped with INSIDE REARVIEW MIRRORS. Unless otherwise specified, manufacturer's standard mirrors are acceptable.
- 2) SEAT BELTS - Driver and each passenger seat. Seat belts to have retractors.
- 3) MUD FLAPS - To be plain, rubber ¼ inch thick, without advertising.
- 4) DUAL WINDSHIELD WIPERS - Multiple speeds electric with automatic type washers and intermittent controls.
- 5) CIGARETTE LIGHTER AND ASH RECEIVER
- 6) DUAL SUN VISORS
- 7) HEATER - Fresh air intake type.
- 8) ARM REST - Driver's side.
- 9) SHOCK ABSORBERS - Heavy-duty, gas type, front and rear, up to and including 10,000 GVWR.
- 10) HOURMETER - Hobbs, Sun or approved alternate, mounted in or under dash, wired through oil pressure sending unit to operator only when the engine is running.
- 11) TOOLS - Wheel wrench on all trucks and jack on trucks up to and including 10,000 GVWR.
- 12) PRE-DELIVERY INSPECTION AND SERVICE - Spare tire not to be furnished unless specified. Seats - Driver and passenger. Antifreeze protection 50/50 mixture.
- 13) ALL ELECTRIC WIRING passing through holes in metal or non-metal wearing surfaces, which could cause wear of the insulation, shall be adequately protected by rubber or plastic grommets, and/or non-metallic conduit. Ends of all wires shall be adequately anchored to prevent loosening.
- 14) BACKUP ALARM - Shall be electrically activated when the transmission is in reverse.
- 15) PAINT COLOR – Shall be National School Bus Yellow manufacturer's premium paint with a urethane clear-coat finish.
- 16) MANUALS – Shall include one (1) service manual and one (1) electrical/wiring manual.

## SPECIFICATIONS FOR PRE-DELIVERY SERVICE

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The term "pre-delivery service and inspection", as used in the City of Mt. Pleasant specifications, shall include the following:

- 1) General appearance of body, both interior and exterior, for completeness and quality of workmanship.
- 2) Lubrication and fluid levels and correcting any leaks:
  - a) Radiator
  - b) Windshield washer
  - c) Battery
  - d) Steering gear or (power pump)
  - e) Brake master cylinder
  - f) Engine oil
  - g) Transmission fluid level
- 3) Mechanical operation of vehicle:
  - a) Steering gear and linkage
  - b) Suspension assembly, front and rear
  - c) Proper tire pressure to normal rated road requirements
  - d) Hood latch
  - e) Headlights, aim and adjust
  - f) Front wheel toe in and torque wheel nuts
  - g) Seat and shoulder belts operative
  - h) All locks and latches to be operative
  - i) Windshield wiper and washer to be operative
  - j) Proper adjustment to all drive belts
  - k) Proper adjustments to carburetor, timing, and throttle linkage
- 4) A check of all electrical operations to include:
  - a) Headlights
  - b) Side marker lights
  - c) Temperature
  - d) Alternator
  - e) Oil pressure lights
  - f) Parking lights
  - g) Stop and taillights
  - h) Directional signals
  - i) Emergency flasher and parking brake lights

It is intended that a vehicle delivery, in accordance with City of Mt. Pleasant specifications, shall be complete, including mechanical details, general workmanship and appearance, and shall be delivered complete with all warranty service books and identification plate.

**Failure to adhere to the specifications may delay payment.**

## SPECIFICATIONS FOR TERMS AND CONDITIONS OF AWARD

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### MANUFACTURER'S REBATE (INCENTIVES)

In any circumstances during or prior to completion of the contract, whereupon the City of Mt. Pleasant (Buyer) becomes eligible to receive a rebate for any vehicle purchased under this contract, it shall be the Vendor's responsibility to inform the Buyer and to advise of the procedures for obtaining such rebate.

### ASSIGNMENT OF CONTRACT

No purchase order (contract) issued as a result of this Bid shall be assigned, changed, or in any manner disposed of, without written permission of the Buyer.

### WARRANTY AND WARRANTY REPAIR WORK

Warranty and warranty repair work shall be defined as the manufacturer's standard limited warranty from the date the vehicle is put into service, and shall otherwise be equal to or exceed that offered to the general public.

The Vendor shall be responsible to arrange a satisfactory agreement with the vehicle manufacturer so that the warranty repairs may be performed at any qualified manufacturer's service and repair location to be chosen by the City.

Extension of warranty and/or other policy adjustments will be considered when constant maintenance is required or if replacement parts prove unsound.

The City of Mt. Pleasant expects the manufacturer to have adequate stock of replacement parts to service the City vehicle and to make delivery within a reasonable time of all normal replacement parts to their dealers who may service the City vehicle. The City further expects that warranty service and repairs, as well as non-warranty service and repairs, will be handled without prejudice by all dealerships throughout the State of Michigan.

### DELIVERY OF VEHICLES

Prior to delivery, each vehicle shall be serviced and inspected by the Dealer or his agent. At a minimum, this pre-delivery service and inspection shall cover the specifications heretofore provided. A copy of the dealer's inspection and service check, including the dealer and vehicle identification, check-off of service and inspection performed, and the service manager's signature, shall be furnished with each vehicle delivered. The vehicle's crank case, differential and transmission shall be filled to the manufacturer's recommended capacity, and the fuel tank shall have a minimum of four (4) gallons in the tank when the vehicle arrives at the delivery destination. The vehicle shall be clean and free from defects when delivered.

Notice of Award resulting from this Bid shall be for delivery during the 2014 model year. Delivery shall be no later than 180 days from the receipt of purchase order. Delivery shall be made to the City of Mt. Pleasant to the Public Works building, 1303 N. Franklin Street, Mt. Pleasant, Michigan 48858. Delivery shall be made by the Vendor between the hours of 8:00 a.m. and 3:00 p.m., Monday through Friday.

### COMPLIANCE OF SPECIFICATIONS

If equipment does not fully comply, the bidder shall designate exceptions to the specifications. When no statement of exceptions is indicated, conformance to the specifications will be assumed. **Exceptions should be registered with item number and description of exception on Dealership Letterhead, to be signed, dated, and submitted with the bid.**

## DETAILED SPECIFICATIONS

### FOR

### ***TWO (2) 2014 CHASSIS-MOUNTED SPREADER & UNDERBODY SCRAPER SYSTEMS WITH FRONT PLOW HITCH***

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The City of Mt Pleasant will supply the successful bidder with two (2) new 2014 International 7400SFA 4 x 2 cabs and chassis. The successful bidder will supply and install the spreaders, the specified heavy-duty underbody scrapers and all hydraulic, mechanical, and electrical connections to make these complete operational units.

All metal work shall be cleaned, primed and painted, either National School Bus Yellow or Black, as specified. All wiring shall be loomed or in-wire harnesses and protected with rubber grommets whenever going through drilled metal holes. All wiring shall be tied and secured, and shall be run through channels or railings whenever possible.

The 2014 7400SFA 4 x 2 cabs and chassis have the following dimensions:

|                                     |            |
|-------------------------------------|------------|
| Wheel Base                          | 183 Inches |
| Back of Cab to Frame End            | 171 Inches |
| Back of Cab to Rear Axle            | 108 Inches |
| Center of Rear Axle to End of Frame | 63 Inches  |
| Over All Length                     | 278 Inches |

#### **Spreader**

- 1) Specifications for a **Swenson model EVA-100-11'** stainless steel chassis mount spreader, complete with top screens, stainless steel full cab shield, stainless steel catwalks, stainless steel light bar, 7" auger, stainless steel inverted vee over the auger, 18' poly spinner disc, chassis mounting kit, no paint on stainless steel items, with carbon steel items painted either black or gray.
- 2) Spreader Control Console - The spreader control shall regulate the auger and spinner speeds. Individual detented dials shall control the auger and spinner, providing proportional control from closed to fully open on the control valve. Front face panel shall have "standby" indicator light activated by pushing the auger dial, blast mode adjustable for momentary or timed up to 16 seconds with cancellation and flashing indicator light. Other features shall include remote standby and blast inputs, switch selectable speedometer interrupt (sander shutdown when vehicle stops), reverse polarity protected, adjustable back lighting via vehicle controls.
- 3) Hydraulic components such as pump, control valve, oil tank, hoses, disconnects, etc. are described elsewhere as part of a central hydraulic system.
- 4) Mud flaps – 1 pair, shall be anti-sail, behind rear tires, plain – **NO ADVERTISING**

#### **12' Underbody Scraper**

- 1) Specifications for **Root model F-8900-DPR-12'** or equal.



- 2) Hanger board – minimum 10" x 30 lb. structural channel reinforced by ½" x 8" plate and 4" S&C 13.8# channel the entire length of hinge line, with a hardened, replaceable center pin bushing.
- 3) Hinge Shaft – 2 ½" O.D. x 96 linear inches minimum high carbon steel running the total length of the hanger board (660 square inches of bearing surface area) with zerk fittings located along the hinge line for lubrication. The hinge system shall consist of two (2) 6" end hinges with greasable thrust bearing at each end of hinge shaft and one (1) 15" center hinge with six attaching bolts, all 3-1/4" O.D. x 2-9/16" I.D. The hanger board cut-out for the center hinge bracket shall have beveled corner cuts and have a 3/8" x 1" reinforcing bar welded over the entire length of the bracket.
- 4) Moldboard – 1" thick x 20" wide x 12' long, heat-treated carbon steel reinforced in the center with 2-1/2" x 2 ½" angle 52" long. The bottom shall be offset to accommodate beveled cutting edges. A set of carbide inserted grader blades with curb guard are to be installed.
- 5) Actuation and shock assembly – moldboard to be actuated by two Root designed 3-1/2" I.D. x 10" stroke double acting cylinders with 2" nitrated piston rods and 3/8" NPT ports. Cylinders to be mounted horizontally on the scraper by 1" thick reinforced steel trunnion brackets. The cylinder shall be retained in the housing by means of a square flange with four (4) 5/8" bolts. The cylinder must be able to be removed from the shock housing, in a quick injury-free manner. Trunnion bearings to be 2-3/4" O.D., 3/8" wall carbon steel bored to accept 2" trunnion pin.
- 6) Circle – 1" thick solid steel, notch-less, 1 pc. design. The center pivot hole shall have a 5" I.D. replaceable bushing for center pin. The center pin is to have a 6" min. O.D. top, 5" O.D. shoulder, 1-1/4" O.D. stub shaft, grease zerk and bolt through hanger board with three ¾" Gr. 8 attaching bolts. Circle clamps shall be 20.5" with 1" top plate. The lower plate shall be welded to hanger board. The top plate and a polyethylene shim shall bolt to the lower plate with 3-1" Gr. 8 bolts with locknuts. Adjustable circle hangers both sides 3" adjustment.
- 7) Power Reverse - to be cab controlled with cushion valve relief, and shall be accomplished using two 4" bore by 14-1/2" stroke double acting cylinders with ½" NPT ports working in tandem and providing positive hydraulic locking. The piston rods shall be nitrated CR steel 2" in diameter. The piston rod ends and the barrel ends of the cylinders shall be welded 2" thick greasable wear blocks. The hanger board bosses shall be 3" O.D. tubing, solid welded top and bottom of the hanger board. Both the anchor and live end pins shall be 2" in diameter, capped with a 5/8" bolt and lock-washer to hold the reverse cylinder down, and the pin shall be held in place by a 5/8" Gr. 8 bolt with nut & washer.
- 8) Installation to include modification or relocation of battery boxes, air tanks and dryers, etc. to achieve necessary mounting height, and hydraulic power is to provide pressure and flow requirements to allow for proper and satisfactory operation.

### Front Plow Hitch

- 1) Hitch - shall be **Root regular (29") detachable Husting-type**; truck half only; shall be welded to a 10" x 20# channel bumper, have top and bottom bracing with bumper, with bracing all being bolted to the frame and not welded.

- 2) Bumper Ends – The bumper ends are to be flared back just enough to assure clearance of plow when fully reversed.
- 3) Installation – shall include being able to use front tow hooks, if applicable. Any modifications to hood or grill for clearance of hitch must meet approval of equipment supervisor.
- 4) Hoses – shall be run to the front for plow operation and capped off.

### **Lights and Electrical**

- 1) Body marker lights – shall meet FMVSS #108, recessed, shock-mounted.
- 2) Strobe lights shall be a strobe light system, consisting of six (6) oval self-contained LED strobe lights in the cab shield, two (2) in the front facing forward & two (2) in the sides facing out. On the rear corner posts of the body will be a three-hole oval light housing for a self-contained, oval LED strobe light in the top hole, LED stop/turn/tail light in the middle hole, and a LED back-up light in the bottom hole.
- 3) Mounted to the catwalk at the rear on the driver's side of the body will be a work light for the spreader.
- 4) Mounted to the back of the cab tank bracket on the driver's side will be a work light for the scraper operation.
- 5) Switches for the above lights will be in the dash of the truck, supplied from the truck dealer.
- 6) A set of plow lights with turn signals shall be installed to the sides of the hood on stainless steel brackets with rubber between the bracket and the hood. The switch will be in the dash of the truck.

### **Hydraulic Pump**

- 1) Hydraulic Pump - Pump shall be a heavy-duty bushing-type positive displacement gear pump. Pump is to be cast iron three piece rebuild-able Parker PGP330 series gear pump with a flow rate of 17 GPM at 1000 engine RPM. The pump shall have a 7/8" – 13T spline shaft. The pump shall have a minimum of 1-1/2" I.D. SAE 100-R4 suction line. A hot shift PTO that is mounted to the MD (3500RDS) series transmission shall drive the pump. The PTO shall run at 103% of the engine speed; PTO shall be Chelsea 277 series.
- 2) Shut Down System - A hydraulic valve of Cartridge design will divert the system oil flow to the reservoir, in the event of a low fluid level. Shall be a two position, three-way, spool type solenoid valve capable of stopping oil flow to hydraulic system when actuated shall be mounted directly to the hydraulic pump discharge port. The return line will be plumbed directly to the system reservoir. The manifold assembly must also incorporate a high-pressure relief valve to protect system from over pressurizing during the shut down operation. This solenoid valve shall be wired to an in-tank mounted float type level indicator rated at 3 amps and mounted from top of reservoir. System shall be designed so when float contacts close, solenoid valves stops pump flow to the system and enunciator in the cab alerts the operator. The low oil control panel shall incorporate

a low oil override switch wired to de-energize shut down system to facilitate diagnostics and equipment storage.

### **Valve Controls**

- 1) Control valve shall be U. S. manufactured. Valve to be load sensing type with o-ring ports. Inlet and outlet ports shall be SAE#12. The hoist section shall also have SAE#12 ports. All other work ports shall be SAE#10. All ports shall be level with each other so as to lay flat on its base. There will be a main relief in the inlet section that will be set at 2200 PSI to protect the system from being over pressurized.
- 2) The Control valve shall be a Green model V20LS valve, and the section is to be arranged as follows:
  - a) Hoist -- 4-way for a double acting cylinder with down side work port relief set at 500 PSI (for future hoist).
  - b) Sander Auger - 12 volt EPC cartridge with 15 GPM spool; built-in pressure compensator and 7/16-20 UNF screw-style manual over-ride with weather pack connectors on wire leads.
  - c) Sander Spinner - 12 volt EOC cartridge with 5 GPM spool; built-in pressure compensator and 7/16-20 UNF screw-style manual over-ride with weather pack connectors on wire leads.
  - d) Plow Lift - to be 4-way for a double acting cylinder with flow control.
  - e) Underbody Lift - to be 4-way for a double acting cylinder with down side work port relief set at 500 PSI with flow control.
  - f) Underbody Swing - to be 4-way for a double acting cylinder with flow control and cushion valve.
  - g) Spreader auger and spinner - are to be plumbed direct, so that no disconnects are required.
- 3) Spreader control shall be an electric controller in the cab to operate the conveyor and spinner.
- 4) Valve controls shall be Morse remote control system with dynamic rod seal cables. Must be bulkhead-type connections at the hydraulic valve sections, and the cable core shall be stainless steel capable of 100 pounds of push and pull. Valve controls shall be mounted at the right of the driver in the best location. The controllers shall be mounted in an entirely enclosed tower. The hoist section shall have a center lock to prevent accidental actuation. All plow and scraper functions shall have dual axis joystick levers stacked together for operation of the remaining sections in hydraulic valve bank.

### **Hydraulic Valve Enclosure**

The valve assembly shall be mounted in a weather-tight enclosure mounted to the outside of the truck in the best location. The valve enclosure shall be fabricated of 10 and 12 gauge steel, and designed to not allow humidity to be trapped inside. Valve shall be mounted with all ports coming out the bottom and holes allowing for hose adapter fitting. Enclosure will allow for bulkhead style cable to enter the front. Valve will be "Boxed In" with the cover and not the base. The cover shall be held to the enclosure by four heavy-duty rubber latches. All plumbing shall be external, directly out the bottom of the valve enclosure.

## **Hydraulic Hoses**

- 1) Hydraulic hoses - shall be secured with non-chafing hose clamps to protect hoses. Clamps shall not exhibit a metal surface at hose securement. Holes and wear areas where hoses pass shall be grommet or rubber lined.
- 2) Suction hoses – Suction line between reservoir shut-off valves to an inlet pump shall be a minimum of 2 inch I.D. with a minimum SAE 100-R4 rating and shall be secured on both ends via heavy duty banding straps, radiator hose clamps unacceptable.
- 3) Pressure hoses – All pressure hoses, including signal sense to pump shall have swivel fittings on both ends and shall be SAE100R2, type AT high pressure hoses from pump to valve unloader (1" I.D.) for operation of dump body cap off, scraper and front plow (3/8" I.D.) and spreader (1/2" I.D.). Return lines and case drain shall have minimum SAE 100-R1 rating.
- 4) Hydraulic Lines and Plumbing - All hydraulic lines and plumbing shall be of sufficient capacity so as not to create heat or turbulence within the hydraulic system. Hydraulic lines shall be routed to minimize interference with equipment and chassis components requiring periodic servicing. Support brackets, grommets, and tie wraps shall be provided where appropriate to protect lines form damage by abrasion, cutting or impact.
- 5) Installation is to include painting of any raw steel used for mounting brackets, hose clamps, etc.

## **Oil Reservoir**

- 1) Oil Reservoir – Shall be approximately 40-gal capacity and located back-of-cab; shall be filled with non-detergent 10W hydraulic oil with rust oxidation and anti-wear inhibitors. The reservoir shall have low oil shut down sending unit wired to the hot shift PTO. In the event of loss of oil, the PTO shall disengage to avoid damage to the hydraulic pump. There shall be a low oil control panel mounted in the cab that will have a low oil over-ride switch to de-energize system to facilitate diagnostics and equipment storage.
- 2) A five inch (5") combination level temperature sight gauge shall be installed to the side of the reservoir; a magnetic drain plug shall be installed at the lowest point of the reservoir, and a filler breather cap with a basket shall be mounted in the top of the reservoir.
- 3) Suction Port - A 1-1/2" full flow brass ball valve shall be plumbed at the suction port of the tank, with a 100 mesh suction strainer with a 3 PSI bypass and have a flow rating of not less than 50 GPM.
- 4) Return Filter – Shall be mounted in the top of the tank and rated for no less than 80 GPM. Filter shall be a ZINGA model TS-1200-25-1-0 with a ZSRE-409-10 micro-glass filter element, and be equipped with a visual filter condition indicator gauge, as well as a 12-volt indicator switch that will be wired to the control panel and backlit for bypass warning. A spare element must be supplied with the system.
- 5) Reservoir tank shall be labeled "Hydraulic Oil".

## **Fuel Tanks**

- 1) Shall be approximately 60-gal capacity and located on back of cab.
- 2) Shall have a solid state electronic sending unit for fuel gauge, and gauge must sense the fuel level within 2" of tank bottom. Drain Plug shall be installed in the bottom of the tank, and a shut-off valve shall be installed on the supply side. Tanks are to be painted gloss black, and are to be clean and free of any debris. Eighteen-inch (18") clearance is required to supply tanks for fuel and hydraulic systems.
- 3) Makes/models and installation locations of components different from those stated in the detailed specifications are to meet approval of the equipment supervisor.
- 4) All items removed from cab and chassis by body vendor (frame ends, fuel tanks, etc.) remain the property of the city and are to be returned with the truck.
- 5) Training in use of the spreader control must be provided to employees by factory representative, if necessary.