

CITY OF MASCOUTAH  
3 WEST MAIN  
MASCOUTAH ILLINOIS 62258

**BACKHOE LOADER BID SPECIFICATIONS**

**BIDS DUE: FEBRUARY 15, 2017, 10:00AM**

The City of Mascoutah is seeking bids from firms for the provision of a backhoe loader and related components. Bid specification packets may be obtained from the City Manager's office at City Hall or downloaded at [www.mascoutah.org](http://www.mascoutah.org). Sealed bids will be accepted at the office of City Clerk, City of Mascoutah, 3 West Main Street, Mascoutah, IL 62258 until 10:00 a.m., February 15, 2017.

## BACKHOE LOADER BID SPECIFICATIONS LIGHT DUTY BACKHOE

### TRADE IN

- 2007 Case 590 Super M Extendable S#N7C432105 Hrs. 4447 with Buckets and Forks 12", 24", 48"

### BASIC SPECIFICATIONS

- Backhoe shall have a minimum digging depth of 17' 11" (5442 mm) with extendible stick.
- Turbocharged engine net flywheel horsepower shall be at least 93 HP (69 kW) according to SAE J1349.
- Engine net peak power@ 1800 rpm shall be at least 105 HP (78kW) according to SAE J1349.
- Machine to be equipped with an economy control function for maximum fuel efficiency.
- Unit shall have a maximum height to the top of the canopy of 9ft 3 in (2819 mm) with standard tires.
- Warranty 2-year/2000 hours complete backhoe warranty.

### ENGINE

- Engine must comply with U.S. EPA Tier 4 Final/ EU Stage IV off road emission requirements.
- Engine shall have an economy mode to help maximize fuel efficiency, while maintaining backhoe performance.
- Engine compartment side panels shall have standard noise reduction and heat control insulation.
- Units shall be equipped with a turbocharged, four cylinders, direct injection diesel engine with high strength, cast iron alloy single block design for high strength and long life.
- Engine shall have a secondary fuel filter with a rating of no more than 4-microns. Engine shall have a vertical spin-on fuel filter.
- Engine shall be equipped with electric fuel priming pump as standard equipment.
- Engine shall have a water/sediment bowl with water separator service indicator light.
- The engine shall have an internally mounted, dry-type, perimeter seal air cleaner with an integral precleaner, automatic dust ejection system, and filter condition indicator.
- The engine will have a standard glow plug starting aid for efficient cold weather starting to -20 degrees F (-28 degrees C) without using ether.
- Engine cooling fan shall have a heavy-duty guard that fully prevents human contact while in operation.
- Coolant circulation shall be provided by a gear-driven water pump, not solely belt driven,

to prevent accessory belt slip and continue coolant circulation in the event of a belt failure. Engine shall be equipped with an alternator that has a charging capacity of minimum 150 amperes.

- Engine shall be equipped with one maintenance-free 880 CCA battery, with the option for two such batteries.
- Engine shall be equipped with a 12-volt direct-electric starting and charging system.
- Engine shall be equipped with a single, automatically tensioned, serpentine accessory belt. Engine air filter shall have a pre-cleaner and a dust ejector.
- Backhoe joystick shall be equipped with a quick idle down feature that lowers the engine speed to 1,000 rpm.
- Machine shall have Automatic Engine Speed Control that reduces engine speed when the backhoe is not in use. This will conserve fuel and lower emission noise.

#### POWERTRAIN/TRANSMISSION

- Transmission shall have an electric, neutral lock switch on the front console to prevent driveline engagement.
- Transmission, differentials, and hydraulics shall have separate fluid reservoirs.
- 4WD shall be pendulum mounted, grease-free with sealed for life kingpins, able to be engaged "on-the-go" while under load or any operating condition.
- Units shall be equipped with a transmission disconnect button on the gear shifter and loader control to allow full engine power to the loader.
- Transmission shall be made, serviced and supported by the machine manufacturer. Transmission shall have spin-on type oil filter vertically mounted.
- The automatically shifting transmission shall have a manual override switch to allow the operator full control over the gear selection.
- Unit shall have a high gear speed of no less than 25 mph (40.0 kph).
- Automatically shifting transmission with 6 forward and 3 reverse shall be offered as an option with "kick-down" capability.
- Planetary Drive shall have four reductions (sun gears) in the front drive.

#### STEERING

- Oscillation shall be no less than 11 degrees each side direction from centerline. Machine shall have hydrostatic steering.
- Steering cylinder shall be double acting with a 52-degree steering angle.

#### BRAKES

- Brake mode selector switch shall have a 3 position switch allowing 2WD, 2WD travel with 4WD braking and full time four wheel drive.
- Two wheel drive with four wheel braking must be available at all speeds and when the machine is in any gear.
- Service brakes shall be hydraulically boosted for low pedal efforts.
- Service brakes shall be completely enclosed and sealed using Kevlar as brake pad media.

#### HYDRAULIC SYSTEM

- Hydraulic system shall include high-pressure hoses consisting of 4 layers of overlapping insulated spiral wire matrix.

- A single, optional auxiliary hydraulic circuit shall be capable of operating hammers, compactors, cold planers, augers, thumbs, side tilt couplers and other work tools.
- Machine must have adjustable auxiliary flow control for better controllability of attachments.
- Machine shall be able to reach maximum lift capacity at any engine speed. Hydraulic pump shall be rated at 43 gpm (163 lpm).
- Machine shall have an electronically controlled variable displacement load sensing, axial piston pump for low idle lifting and maximum durability. Closed-center implement valves shall be standard.
- Unit shall contain flow sharing valves to allow for machine multifunction
- Backhoe hydraulic lines shall be fastened and constrained from hanging low within the chassis, preventing hoses from damage.
- Combination auxiliary lines shall be available for both one way or two way flow
- All hydraulic hoses restrained by rubber grommets and steel band clamps shall have full protective coverage by the rubber grommet, preventing cuts and chaffing by the band clamps.

#### AXLES

- Front axle shall be pendulum mounted, permanently sealed and lubricated.
- Rear axle shall have differential lock with "on-the-go" engagement.
- The final drives shall be heavy-duty outboard planetary type, distribution loads over three gears sealed in separate oil compartments for long-life and minimum service.
- Heavy-duty rear axle shall be semi-floating with self-adjusting inboard brakes.

#### WHEELS/TIRES

- 4WD Tires shall be no less than 12.5/80-18 12PR (front) and 19.5-24 12PR (rear) with radial tires.
- All valve stems to be protected by metal valve stem covers.

#### OPERATORS STATION

- OSHA approved ROPS/FOPS shall be integral with cab and canopy.
- Pilot Controls for the backhoe shall be adjustable fore/aft, side to side and actuated by a foot control.
- Machine shall come standard with horn, audible back up alarm and electric fuel system shut off.
- The governor pedal shall be hinged and mounted to the floor for maximum pedal positioning control.
- Side instruments shall include a premium gauge cluster consisting of LCD Information screen and LCD warnings. LDC warns shall include; Engine Oil Pressure, Machine Locked, Service Due, Air Filter Blocked, High Coolant Temperature, Auto Idle Shutdown, High Torque Converter Temperature and Hydraulic Filter Bypass.
- Unit shall have a lighted instrument panel located on the right side of the cab so that it is visible from both loader and backhoe operating positions. Indicator lights to include, Water in Fuel, Remote dial throttle active, engine warning, warning lamp, emissions module malfunction, AESC active, Regen Inhibited, Low battery/charging system warning, high hydraulic oil temperature, Wait to start and Eco Mode Active.
- Cab machines shall include four front and four rear working lights.

- Machine shall have stop and turn signals with flashing hazard lamps visible from front and rear.
- Electric auxiliary socket shall be available on roof for connection to items such as a rotating beacon.
- Roof cab shall have three magnetic beacon locations.
- Operator's compartment shall come equipped with an air suspension seat that can be adjusted in the fore/aft position and has a lever that controls the releases for rotation at 180 degree swivel from anywhere on a sliding track mechanism.
- With doors and windows closed, machine operating at maximum governed speed unit shall have a maximum operator sound exposure Leq of 79 dB(A) according to SAE J1166.
- Tilt and telescoping steering wheel shall be included.
- Cab shall have an air conditioner that provides the operator with a choice of fresh outside air drawn through filters or recirculating cab air with HVAC recirculation selector and am/fm radio.
- Cab shall be equipped with two doors and 6 opening windows and floor mat. Operator's compartment shall feature laminated safety glass on front, windshield and tempered glass on all other windows.
- All removable glass panels shall be flat glass for easy and low cost service.
- All rear window sections shall stow overhead, inside the cab for maximum visibility, ventilation and operator comfort.
- Unit shall have a pantographic front windshield wiper and intermittent rear window shield wiper.
- Enclosed cab shall have a front window visor that extends entire width of window.
- Exhaust stack shall be located to the side an aligned with ROPS as to not obstruct operator's vision.

## BACKHOE

- Maximum boom width shall be no wider than 10 inches (254 mm).
- Per SAE standards, stick-digging force shall be a minimum of 9,7571b (43.4 kN) with a fully retracted extendible stick.
- Backhoe bucket shall have a minimum of 205 degrees of bucket rotation in a single pin position.
- Per SAE J31, backhoe stick lifting ability at 8ft (2438 mm) shall be no less than 5961 lb (2704 kg) with a standard stick.
- Per SAE J31, backhoe stick lifting ability at 8ft (2438 mm) shall be no less than 5493 lb (2492 kg) with a fully retracted extendible stick.
- Per SAE J31, backhoe boom lifting at 8 feet (2438 mm) shall be no less than 3700 lbs (1678 kg) with a standard stick.
- Per SAE J31, backhoe boom lifting at 8 feet (2438 mm) shall be no less than 3241 lbs (1470 kg) with a fully retracted extendible stick.
- Extendible stick shall be included.
- Extendible stick shall be field adjusted in less than 30 minutes to eliminate excessive clearance, using simple hand tools.
- All sticks shall have serrated edges, at least 28" (760 mm) long, to help clamp objects securely with bucket.
- All sticks shall be thumb-ready with thumb cylinder mounts and stops standard. Thumb

must be able to be added without welding.

- Extendible stick shall be self-lubricating, adjusted with shims, and require no grease. Boom cylinder shall be exterior mounted for serviceability.
- Stick cylinder shall be exterior mounted for serviceability.
- Backhoe shall be equipped with a boom lock that can be controlled from the seat.
- Backhoe controls shall be available as pilot operated joystick controls with a standard pattern changer for SAE excavator or ISO backhoe control patterns.
- Backhoe shall be controlled with adjustable excavator style pilot operated joystick controls. Auto-up stabilizer controls shall be available.
- Stabilizer guards shall be available to protect stabilizer cylinders from damage.
- Backhoe shall have stabilizer lock valves.
- Flip over stabilizer pads shall have a dirt grouser.

#### LOADER (SELECT BUCKET)

- Integrated Tool Carrier loader shall be controlled by pilot operated controller.
- A continuous flow button for the Integrated Tool Carrier shall be available to allow the operator to set the auxiliary hydraulic flow at any flow setting needed.
- Machine shall have parallel lift for better load retention and improved material handling. Loader frame/linkage shall be of a tool carrier design including a hydraulic quick coupler actuated from inside the cab.
- Operator shall be able to easily remove the loader bucket attachment and quickly couple a fork carriage, material handling arm, broom, or other various attachments without leaving the cab except to connect hydraulic lines.
- 1.31 CYD (0.96 m<sup>3</sup>) General Purpose Front Bucket and 48-Inch Forks both Coupler Style.
- Loader shall be equipped with a return-to-dig mechanism.
- Loader shall be equipped with a lift cylinder brace to mechanically hold the loader arms in the raised position.
- Loader shall incorporate a steel bumper system to protect battery and engine components. Loader arm torque tube shall be constructed such that it is welded to each side.
- Loader linkage shall incorporate a single, full width main tower pin for maximum strength and load distribution.
- Loader bucket base cutting edge shall be especially hardened steel, achieving Rockwell hardness of 50 or greater.
- Loader bucket shall have a 2-piece or 3-piece bolt-on cutting edge for serviceability.
- Loader bucket lower time from full raised position to digging position shall be no more than 3.2 seconds.
- 48" rear bucket shall be included with smooth edge and 48 pallet forks.

#### WORK TOOL OPTIONS

- 24" & 12" rear buckets shall be included with pin-on tooth tips that are exchanged whereby the pin retainers are diagonal or vertical, allowing them to be extracted or inserted with a hammer and punch only.
- A quick coupler system shall be available, which will pick up the 'direct mounted' work tools on rear of machine.

#### SERVICEABILITY

- Hood release to be lockable and easily accessible from inside the cab.
- Engine oil, transmission oil, hydraulic oil, brake fluid, washer fluid, coolant, engine air filter, and engine air filter monitor shall all be consolidated service points, accessible under the hood with loader arms down.
- The battery(ies) shall be accessible without the use of hand tools to remove panels, toolboxes, etc.
- Machine shall have easily accessible jumper posts to aid in jump-starting machine or other machines.

**OWNING AND OPERATING COSTS**

- Front axles shall have sealed king pin and center pendulum bearings. Driveshaft universal joints shall be maintenance free.
- Standard fill hydraulic oil must be Advanced HYDO 10 with up to 6000hr service interval in typical applications.
- Load Sensing Variable Displacement pump shall be standard for optimized fuel efficiency and performance.
- Front and Rear Axle Oil change shall have a 1000- hour change interval for lowering operating maintenance cost.
- Cooling System shall have a 12,000-hour change interval for lowering operating maintenance cost.
- Engine shall have a 500-hour oil change interval for lowering operating maintenance cost.

**ADDITIONAL FEATURES**

- Machine shall be equipped with an optional, on-board machine communication system, recording and transmitting GPS, service hour reading, fuel tank reading and ignition status.
- Optional front fenders shall be included from the OEM, articulating with the tires for maximum coverage.
- Machine shall be equipped with ride control.
- Machine shall be equipped with rear hydraulic thumb.

**ADDITIONAL INFORMATION**

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**BIDDER INFORMATION**  
CITY OF MASCOUTAH  
3 WEST MAIN STREET  
MASCOUTAH, IL 62258

BID DATE: 10:00 AM, February 15, 2017

BIDDERS NAME: \_\_\_\_\_

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

CITY, STATE: \_\_\_\_\_

PHONE: \_\_\_\_\_

ESTIMATED DELIVERY DATE: \_\_\_\_\_

\_\_\_\_\_  
By:

\_\_\_\_\_  
Title: