State of Illinois

Department of Transportation

Bureau of Business Services

**Specifications and Questionnaire for a Track-Mounted, Multi-Purpose, Hydraulically Powered Mini Excavator**

21,000 Lbs. Operating Weight

November 2019

The following specifications describe the **minimum** requirements for heavy-duty, multi-purpose, hydraulic powered track type excavator. The equipment bid shall be new, of current design and manufacture, and a regular production model. Any additions, deletions, or variations from the following specifications must be noted or the bid will be rejected. Any standard items appearing in the manufacturer’s regular published specifications furnished by the bidder shall be included in the bid unless otherwise noted.

Machine modification to meet the operational and capacity requirements shall be limited to the published standard or optional equipment as regularly installed and approved for use by the manufacturer and depicted in the furnished literature. All operating specifications are based on SAE standards. These standards shall be the basis for determining compliance with specified requirements.

Bidders quoting on other-than-specified equipment must submit with their bid written proof of the following:

* The manufacturer of the equipment proposed has been actively involved in the manufacture of the equipment called for in the Bid for a period of not less than 5 years.
* Parts and service for the equipment proposed are readily available to and within the State of Illinois.

It is the responsibility of each bidder to complete and return this questionnaire with the bid.

**Unless otherwise specified, the proposed equipment shall be complete in all parts and ready for immediate use upon delivery.**

**Bidders are advised to carefully read these specifications as changes have been made since the last solicitation issue.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Proposed with this Bid:** | | | | | |
| Make: |  | | | | |
| Model: | |  | | | |
| Manufactured By: | | | | |  |
| Bidder: | | |  | | |
|  | | |  | | |
|  | | |  | | |
| Telephone: | | | |  | |
| Contact Name: | | | |  | |
| Email: | | | |  | |

The Illinois Department of Transportation reserves the right to waive minor informalities, deficiencies or technical variances which by their nature are restrictive to a given manufacturer, if in its’ judgement, it would be in the best interest of the State to do so and it would not prejudice the rights of other bidders.

Serviceability will be a factor in award. Successful bidder shall either be able to provide service after purchase or shall indicate other qualified service facilities able to service equipment, within a reasonable period of time at agency locations. Bidder shall provide documentation and enumerating service locations. A Review of the bidder's ability to provide prompt parts and service to the State of Illinois and in particular to the delivery location, will be considered in determining award.

Bids will only be accepted from established manufacturers or their authorized dealers. Any dealer submitting a bid hereby guarantees that it is an authorized dealer of the manufacturer and that the manufacturer has agreed to supply the dealer with all quantities of products required by the dealer in fulfillment of its obligations under any resultant contract with the State. Bidder must submit authorized dealer letter upon request.

**Warranty:**

Unless otherwise specified, Manufacturers’ standard warranty shall be provided. **Bidder shall attach copies of warranty with their bid****. Warranty shall commence at the Illinois Department of Transportation in-service date.** If any equipment fails to conform to the warranties during the applicable warranty period, the Vendor or Manufacturer will adjust, repair or replace the equipment at no charge to the Department as soon as possible upon notice from the Department. Equipment shall be repaired on-site and will be performed at no additional cost to the Department.

The Vendor may provide or perform warranty service at a dealer location within the Districts geographic region if on-site repair is not possible. Vendor shall facilitate pickup and delivery of equipment at Vendor's cost if warranty repair(s) are made off-site during the warranty period. The contract Vendor is responsible for any failure of their allied or sub-contractors’ fulfillment of said warranties. Failure to provide this service shall result in a “Complaint to Vendor” that could affect future bid awards.

**Delivery:**

It will be the responsibility of the successful vendor to guarantee delivery within the quoted time and to require allied manufacturers or suppliers to complete the installation of auxiliary equipment in accordance with the quoted delivery time.

Failure to comply with the quoted delivery time because of delays resulting from the inability of suppliers of allied equipment such as bodies, snowplows, spreaders, etc., may be reason to refuse to consider similar items from those suppliers on future bids.

All equipment provided by the Vendor and the sub-contractor(s) shall be fully operational when delivery is made. Any noted defects at the time of delivery shall be addressed by Vendor in the first 30 days of in-service.

Bidder/Vendor acknowledges the requirements above. Yes  No

|  |  |  |  |
| --- | --- | --- | --- |
| Bidder/Vendor Initials: |  | Date: |  |

**Note: If the equipment proposed exceeds the minimums called for in the specification please do not mark NO. Mark Yes and explain with a short comment on how it exceeds.**

**The excavator shall include the following standard or optional equipment and accessories:**

**Size:**

The excavator shall have a minimum compliant operating weight of approximately 20,500 lbs.to 22,000 lbs. when equipped per specifications.

Operating weight equipped per specifications:

|  |  |  |
| --- | --- | --- |
| Operating weight: |  | Lbs. |

**Arm, Buckets, and Accessories:**

The excavator shall be furnished with a hydraulic operated variable angle boom (VAB) with a boom-in reach of approximately 9’. Reference picture on last page of specification.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Boom reach: |  | Feet |  | Inches |

Complies:  Yes  No

The variable angle boom shall be furnished with a boom holding or anti-drift valve for precise boom control while setting pipe or other similar functions.

Complies:  Yes  No

The excavator shall be furnished with an arm (stick) length of no less than 7’-2”.

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| --- | --- | --- | --- | --- |
| Arm length: |  | Feet |  | Inches |

Complies:  Yes  No

Equipped per specifications, the excavator shall have an approximate digging depth of 13’-9” to dig to an 8’-0” level bottom excavation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Digging Depth for 8’ level bottom: |  | Feet |  | Inches |

Equipped per specifications; the excavator shall have an approximate digging depth of 15’-0”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Maximum Digging Depth: |  | Feet |  | Inches |

Minimum reach at ground level shall be approximately 25’-0”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reach @ ground level: |  | Feet |  | Inches |

Complies:  Yes  No

Equipped per specifications the excavator shall not have a transport height greater than 12’-3” on a 36” deck height trailer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Transport Height: |  | Feet |  | Inches |

Complies:  Yes  No

Lifting capacity at ground level over the end, extended 20’ with blade down shall be approximately 4,700 lbs. equipped per specifications, including counterweight.

|  |  |  |
| --- | --- | --- |
| Extended over the end lifting capacity @ ground level: |  | Lbs. |

Complies:  Yes  No

The ISO lifting capacity over-the-side at 15’-0” reach with the specified stick shall be a minimum of 2,900 pounds.

|  |  |  |
| --- | --- | --- |
| Extended 15’-0” over the side lifting capacity @ ground level: |  | Lbs. |

Complies:  Yes  No

The excavator equipped with the specified stick shall have an ISO rated bucket digging force of approximately 13,700 pounds.

|  |  |  |
| --- | --- | --- |
| Bucket digging force: |  | Lbs. |

Counter weighting is extremely important in ensuring the stability of the machine while operating in uneven terrain. The machine will be operated in severe conditions and be used in response to natural and manmade disasters as well as routine ditch cleaning and setting pipe and entrance culverts. Proper balance is important to promote operator and worker’s safety. Please list below the counter weighting provided with this machine, keeping in mind the options specified with the base machine.

|  |  |  |
| --- | --- | --- |
| Counter weight: |  | Lbs. |

This machine is to be furnished with a coupler system to allow the operator to switch buckets or attachments. This device shall be of the manufacturers design. This coupler shall also be compatible with the hydraulic “thumb” specified. The use of this type coupler serves several purposes. First it allows the district to use any of the assortments of buckets presently in their inventory and allows the machine to perform the routine ditch cleaning operations with minimal repositioning of the machine. Second and most important, the use of this device has reduced the personal injuries we have experienced while manually removing, aligning, and reinstalling pins in both the end of the stick and at the bucket. Manually removing pins, realigning pins is more difficult and dangerous when performed on the uneven terrain of a construction work site. The size of the coupler shall be as recommended by the manufacturer of the machine with consideration given to the buckets and features specified.

Complies:  Yes  No

Component:

|  |  |
| --- | --- |
| Make: |  |
| Model: |  |

**Buckets:**

The following two (2) buckets shall be furnished with the track excavator requested. All capacities listed shall be measured using SAE heaped standards:

1. Standard 24” wide bucket ditch type, with four (4) replaceable type teeth and a .35 cu. yd. capacity.
2. Standard 48” wide hydraulically tilting, ditch cleaning bucket with smooth cutting edge and drain holes.

Complies:  Yes  No

Note: IDOT is aware exact capacities may vary per manufacturer.

|  |  |  |
| --- | --- | --- |
| Bucket capacity No.1: |  | Qu. Yd. |
| Bucket capacity No.2: |  | Qu. Yd. |

Component:

|  |  |
| --- | --- |
| Make: |  |
| Model: |  |

**Hydraulic “Thumb” Attachment:**

The thumb type bucket attachment shall be rated for the capacity of the excavator, hydraulically operated and be fully controlled by the operator’s controls in the cab. All hydraulic hoses, connections, hardware, and brackets shall be included and operational when delivered.

Complies: Yes  No

|  |  |
| --- | --- |
| Describe: |  |
|  | |
|  | |

The thumb shall fold and store on the dipper stick when not in use.

Complies: Yes  No

The hydraulic “thumb” shall be mounted after the coupler so they will function independently, without interfering with the operations of each other.

Complies: Yes  No

This shall include all valves and plumbing to make the thumb operational by use of valves rather than making and breaking hydraulic connections. Excavator controls shall be used to operate both functions. Changing these from one to the other shall be accomplished by the operator without leaving the cab.

Complies: Yes  No

**Dozer Blade:**

The excavator shall be equipped with an operator controlled hydraulic dozer blade. The blade shall be approximately 8’-0” wide and approximately 18” in height.

Complies:  Yes  No

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dozer blade height & width: |  | Height |  | Width |

The blade shall be capable of lifting to an approximate height of 13” for loading on trailers.

Complies:  Yes  No

|  |  |  |
| --- | --- | --- |
| Lifted blade height: |  | Inches |

A bolt-on replaceable cutting edge for the dozer is desirable if offered. Is this available?

Complies:  Yes  No

**Diesel Engine:**

The excavator shall be powered by a current production, liquid cooled, turbo charged, diesel engine with an ISO net horsepower minimum of 70HP and minimum displacement of 199 cu. in.

Component provided:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Make: |  | | | | | | | | |
| Model: |  | | | | | | | | |
| Net H.P.: |  | | | | | | @ | |  | RPM |
| Number of cylinders: | | | |  | | | | | |
| Displacement: | |  | | | | | | | |
| Rated H.P. (Gross) | | |  | | | | | | |
| Turbo Charged: Yes | | |  | | No |  | |  | |

The engine shall be compliant with all present clean air regulations and include all Tier 4 emission standards.

Complies:  Yes  No

Additional equipment and accessories shall include:

1. Cold weather starting aid.
2. Dry type primary air cleaning element equipped with safety element and restriction indicator.
3. Muffler as required to meet emissions.
4. Engine side shields or hood with locks.
5. Engine fuel filter/water separator.
6. Auto-idle feature

Complies: Yes  No

**Cooling System:**

Pressurized liquid cooling system equipped with a thermostat. System shall be filled with manufacturer’s approved extended life antifreeze.

Complies: Yes  No

**Transmission:**

Independent hydraulic drive to each track shall be provided by compact axial piston motors. Travel speeds shall be controlled by an auto-shift feature for high/low utilizing an auto or power shift feature. These functions shall include both forward and reverse directions and from 0 to approximately 3.0 MPH.

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| --- | --- | --- | --- |
| Travel speed range: |  | | MPH |
| Describe travel feature: | |  | | |
|  | | | | |
|  | | | | |

Travel motors shall be equipped with a device to prevent over-speeding when going down an incline.

Complies:  Yes  No

**Steering:**

Independent drive to each track that allows track counter-rotation. Foot pedal control steering and/or combination lever-steer system shall be provided.

Complies:  Yes  No

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| --- | --- |
| Describe: |  |
|  | |

**Brakes:**

Service brakes shall be wet disc design that automatically releases when propelling and applies when stationary.

Complies:  Yes  No

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| --- | --- |
| If No describe: |  |
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**Tracks and Undercarriage:**

The undercarriage and tracks shall be sealed and lubricated.

Complies:  Yes  No

Minimum length of track on the ground shall be 7’-2” minimum.

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| --- | --- | --- | --- | --- |
| Track length: |  | Feet |  | Inches |

Complies:  Yes  No

Track shoes shall be an approximate width of 18” and feature steel 3-bar grouser type track shoes.

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| --- | --- | --- |
| Track shoe width: |  | Inches |

Complies:  Yes  No

The track shoes shall include replaceable bolt-on rubber cleats.

Complies:  Yes  No

***Note:*** Rubber tracks do not meet this requirement.

|  |  |
| --- | --- |
| Describe track: |  |
|  | |

Undercarriage rollers shall be of an excavator design with large diameter pins. Undercarriage shall have a minimum of 5 bottom rollers per side.

|  |  |  |
| --- | --- | --- |
| Rollers per side: |  | Each side |

The excavator undercarriage shall include hydraulic type track tension adjustment.

Complies:  Yes  No

**Electrical:**

The excavator shall be equipped with a 24-volt electrical system and require two (2) batteries.

|  |  |  |
| --- | --- | --- |
| Batteries: |  | CCA |

Complies: Yes  No

***Note:*** A 12-volt electrical system is acceptable if a 24-volt system is not offered as an option and all other capacities are met.

A minimum 50-amp alternator and transistorized voltage regulator.

Complies: Yes  No

|  |  |  |
| --- | --- | --- |
| Alternator rating: |  | Amps |

The excavator shall be provided with the following lighting for day and night operations:

* Boom mounted work light(s).
* Turntable mounted work lights.
* Cab exterior and cab interior lighting
* Instrument and gauge lighting
* LED Warning strobes

Complies: Yes  No

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| --- | --- | --- |
| If No Describe: |  | |
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**Hydraulic System:**

The excavator shall feature two (2) joystick hydraulic control with functions in the SAE approved pattern for swing, boom, dipper, and bucket control functions. These excavators shall include adjustable control patterns as controlled by the operator.

Complies: Yes  No

|  |  |
| --- | --- |
| Describe pattern alteration and control: |  |
|  | |

All excavator operations shall be powered by hydraulic pump(s) with an approximate total flow of 60 gpm. The system shall be load sensing variable flow design with High Flow auxiliary circuit.

Complies: Yes  No

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pump #1 flow rating: |  | GPM | | | | |
| Pump #2 flow rating: |  | GPM | |
| Hydraulic system operating pressure: | | |  | | PSI |

***Note:*** A single axial piston style pump is acceptable provided it will meet or exceed the flows and pressures in the specifications.

The hydraulic system must include an auxiliary high flow minimum of 32 gpm at 3,500 psi. to power the use of hammers, forestry heads, etc. A case drain back system shall be included for attachments.

Complies: Yes  No

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Auxiliary flow rating: | |  | | | GPM |
| Auxiliary system operating pressure: | | |  | | | | PSI |
| Describe auxiliary hydraulic system: | | |  | | | | |
|  | | | | | | | |
|  | | | | | | | |

The hydraulic system shall capable of operating all attachments specified. All attachments specified must be delivered with this machine, and all must be operable from the operator’s position in the cab. If additional auxiliary hydraulics are required, they shall be included.

Complies: Yes  No

**Operator’s Cab:**

The cab shall be manufacturer’s deluxe fully enclosed cab with sound suppression and lockable door(s). Cab shall be constructed to incorporate an OSHA approved and SAE rated ROPS support structure.

Complies: Yes  No

The cab shall include hard coated, ballistic type polycarbonate front windows and the installation of removable guards for protection of the cab and operator from debris thrown by the operation of a landscape mulching device. The guards while providing protection must not hinder the operators vision.

Complies: Yes  No

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| --- | --- |
| If No describe: |  |
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The side windows shall open if option is available and an opening “sky light” with sun shade or tinted glass in the top of the cab shall be included.

Complies: Yes  No  Not available

An operator-controlled wiper/washer system shall be provided for the front window.

Complies: Yes  No

The operator’s seat shall be fully adjustable suspension type either air or mechanical, and provide adjustment for leg room, height, reach, weight and lumbar support. High visibility seatbelt (i.e. Blaze orange) with warning indicator shall be included (Fasten seatbelt).

Complies: Yes  No

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| --- | --- | --- |
| Suspension type: |  |  |

The cab shall include manufacturer’s standard filtered and circulated air conditioning/heater/defroster and controls.

Complies: Yes  No

The operator’s cab shall include vibration dampener suspension and Manufacturer’s standard sound suppression treatment.

Complies: Yes  No

The excavator shall be provided with rear view mirrors for the operator to see what is to the rear of the machine.

Complies:  Yes  No

A multi-function LCD or LED screen shall feature the ability to monitor the following machine information:

* Engine coolant temperature
* Fuel level
* DEF fluid level if equipped
* Digital electric hour meter
* Oil pressure warning
* Hydraulic oil temperature

Complies: Yes  No

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| --- | --- |
| If No Describe: |  |
|  | |

Additional cab equipment and accessories shall include:

* Ignition with safety start
* Horn
* Mounting steps with handholds
* Exterior and interior mirrors
* AM/FM radio with weather band and Bluetooth connectivity.
* 12-volt power points
* Debris guards (vertical and horizontal bars or plate covers to protect cab from debris)
* Bumper guards

Complies: Yes  No

|  |  |
| --- | --- |
| If No Describe: |  |
|  | |

**Rear View / Camera System:**

* Color Monitor Displays Camera and Distance or position to Obstacles
* System Provides Visual and Audible Alert from Obstacles
* Waterproof and heated Backup Camera (IP69K) with Infra-Red Night Vision
* View displayed as seen (not mirror image)
* Aircraft grade cable connectors
* Mounting locations subject to IDOT approval

Complies:  Yes  No

Component:

|  |  |
| --- | --- |
| Make: |  |
| Model: |  |

The cab shall include hard coated polycarbonate glass windows and the installation of removable guards for protection of the cab and operator from debris thrown by the operation of a landscape mulching device. The guards while providing protection must not hinder the operators vision.

Complies: Yes  No

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| If No describe: |  |
|  | |

**Finish:**

All exterior surfaces normally painted or powder coated shall be manufacturer’s standard color.

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| --- | --- |
| Describe finish: |  |

|  |
| --- |
|  |

**Warranty:**

Full coverage warranty for a minimum 24 months shall be provided. The warranty shall be the standard maximum coverage warranty offered with no additional charges. All repairs performed under this warranty shall be done on the seller’s premises. He shall be responsible for all transportation conveying the machine both to and from the assigned location to perform said repair. This work shall be completed and the machine returned in a timely manner. The bidder shall attach a copy of warranty with the bid.

Complies: Yes  No

|  |  |
| --- | --- |
| Describe warranty: |  |
|  | |
|  | |

**Preparation:**

This machine is to be delivered in first-class operating condition with acceptance subject to Department of Transportation approval.

Complies: Yes  No

The unit shall be delivered oiled, greased, serviced and ready for operation.

Complies: Yes  No

**Optional Equipment and Installation:**

**The following optional equipment or installation shall only be quoted when specifically called for in the “Bid”.**

**Hydraulic Mulcher:** See reference picture last page of specification.

The mulcher shall be designed for brush clearing, vegetation management. and removing undesirable growth from backslopes and rights of way.

Complies: Yes  No

The product shall be a cutter shaft design with reversible, replaceable teeth designed to ensure at least one tooth is in contact with the cutting material at all time. The mulcher or forestry head must be designed to operate and mount to the track excavator specified above. It shall be readily attachable to the coupler provided, with quick attach hydraulic fittings. All other controls shall be easily accessed by the operator in the cab.

Complies: Yes  No

Component:

|  |  |
| --- | --- |
| Make: |  |
| Model: |  |

The mulcher shall be approximately 48” wide with a working width of approximately 40”. It shall be approximately 28” long with an approximate overall height of 42”.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mulcher width: |  | | | Inches | |
| Mulcher operating width: | | |  | | Inches | |
| Mulcher length: | |  | | Inches | | |
| Mulcher height: | |  | | Inches | | |

The mulcher shall weigh no more than 1,200 pounds, and be belt driven by an axial piston, dual speed hydraulic motor.

Complies: Yes  No

|  |  |  |
| --- | --- | --- |
| Mulcher weight: |  | Lbs. |

The mulcher shall require the excavator to produce an auxiliary hydraulic flow of 18 to 34 gpm at a pressure of 2,175 to 3,626 psi.

|  |  |  |  |
| --- | --- | --- | --- |
| Hydraulic flow: |  | | GPM |
| Hydraulic pressure range: | |  | | | GPM |

The drum shall have an operating rpm 2,770 to 2,890. The drum shall include a minimum of 18 replaceable cutting teeth. An additional set of replacement teeth shall be provided.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Drum spin rate |  | | RPM | |
| Number of teeth: | |  |  | |
| Additional teeth provided: Yes  No | | | |

The mulcher shall include all manufacturers safety devices and warnings including a rear chain guard.

Complies: Yes  No

The mulcher shall include an integrated stand for level storage and bolt-on replaceable skid shoes.

Complies: Yes  No

|  |  |
| --- | --- |
| Describe stand and shoes: |  |
|  | |

**General:**

Three copies of all operator’s manuals, parts lists, and warranty information shall be provided at time of delivery to each district receiving one or more units.

Complies: Yes  No

One set of service manuals shall be provided to each delivery location.

Complies: Yes  No

***Note:*** The manuals, parts lists, and service or shop manuals listed above may be furnished on CD/DVD or flash drive in lieu of paper.

**Training:**

Instruction must be performed by **qualified** factory or dealer personnel covering the operation, routine service and maintenance of the machine shall be provided upon delivery. The training shall be for all personnel in the assigned headquarters location of the machine. More than a single day may be required to satisfy this requirement.

Complies: Yes  No

|  |  |
| --- | --- |
| Describe: |  |
|  | |
|  | |

***Note:*** *This is not a sales call*. Training not meeting IDOT expectations will generate a “Complaint-to-Vendor” filing that would affect award recommendations for future quotations.

**Requirements Covering Items Detailed Above:**

All equipment cataloged as standard or safety related shall be furnished and in place and shall be included in the purchase price of the unit. Any parts, tools, and/or accessories not specifically called for but required for proper operation shall be provided.

Complies:  Yes  No

The component parts of the unit shall be of proper size and design to safely withstand maximum stresses imposed by a capacity load, and the manufacturer's rated loads for all component parts shall **not** be exceeded when the unit is so loaded.

Complies:  Yes  No

**Repair Parts and Service:**

Since continuous operation of this excavator is of the utmost importance and sometimes of an emergency nature, it is necessary that the successful bidder be able to render prompt parts and service within the State of Illinois.

|  |  |
| --- | --- |
| List locations where service is readily available: |  |
|  | |
|  | |
|  | |

The vendor or manufacturer of the unit which is considered for award shall, at the request of the State of Illinois, demonstrate this equipment within the receiving District in the State of Illinois in the presence of authorized State personnel to prove out any features which may be in question.

Complies: Yes  No

|  |  |
| --- | --- |
| If NO to any portion, please explain: |  |
|  | |
|  | |

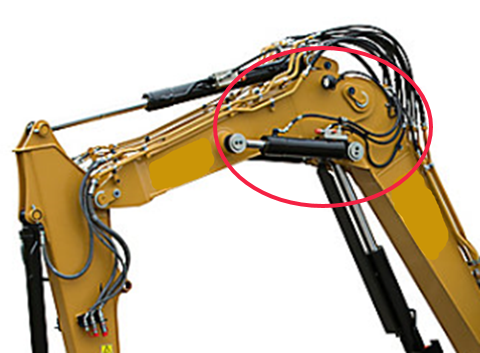
**Bid Package:**

If not quoting in BidBuy, bidders will need to send two copies of each of the following with their bid response.

a) Specification Questionnaire

b) Descriptive Literature

Hydraulic Assisted Variable Angle Boom (VAB) Picture is for visual reference only. Do not scale from picture.



Hydraulic Mulcher: Picture is for visual reference only.

