State of Illinois

Department of Transportation

Bureau of Business Services

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

18,900 Lbs. Operating Weight

July 2018

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. **Two copies**of published specifications shall be included with the bid.

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 makes and models of the machines listed below are solely for providing bidders a minimum level of quality and size of machine requested. These machines also have provided an acceptable level of service and performance to the State of Illinois Department of Transportation. All machines quoted will be evaluated by compliance with the following specifications. Since the work performed and expected of these machines can be of an extreme emergency nature, the potential availability and proximity to obtain parts and service will be equally important and considered in determining equality.

The makes and models are as follows:

Bobcat E85 R-Series

Case CX80C

Cat 308E2 CR

John Deere 85G

Komatsu PC88MR-10

Link Belt 80 Spin Ace

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

**Size:**

The excavator shall have a minimum SAE compliant operating weight of approximately 18,500 lbs.to 19,800 lbs. when equipped per specifications.

Operating weight equipped per specifications:

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

**Arm, Buckets, and Accessories:**

The excavator shall be furnished with standard length boom with a minimum length of 11’-0”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Boom length:  |       | Feet |       | Inches |

The excavator shall be furnished with an arm (stick) length of no less than 6’-10”.

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

Complies: [ ]  Yes [ ]  No

Equipped per specifications, the excavator shall have a 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 24’-0”.

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

Complies: [ ]  Yes [ ]  No

The 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

Equipped per specifications the excavator shall have a transport height no greater than 9’-1”.

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

Complies: [ ]  Yes [ ]  No

Minimum SAE lifting capacity at ground level over the end and fully extended shall be no less than 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 6’-10” arm 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 6’-10” arm shall have an ISO rated bucket digging force of 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 may be of the manufacturers design or purchased from a supplier. 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 boom 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.

Complies: [ ]  Yes [ ]  No

|  |  |  |
| --- | --- | --- |
| 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.

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 7’-3” wide and approximately 18” in height.

Complies: [ ]  Yes [ ]  No

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

The blade shall be capable of lifting to maximum 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 loader shall be powered by a current production, liquid cooled, turbo charged, 4-cylinder, diesel engine with an SAE J1349 net horsepower minimum of 57 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.

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.

|  |  |  |
| --- | --- | --- |
| 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

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

**Brakes:**

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

Complies: [ ]  Yes [ ]  No

|  |  |
| --- | --- |
| If No describe:  |       |
|       |
|       |

**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.

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

Complies: [ ]  Yes [ ]  No

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

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

Complies: [ ]  Yes [ ]  No

The track shoes shall include bolt-on rubber cleats.

Complies: [ ]  Yes [ ]  No

***Note:*** Rubber track does 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.

The electrical system shall include a buss style connection to provide 12-volt service for the Department of Transportation to connect radio equipment and other devices. The buss shall be fused at a minimum 20 amps.

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

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 [ ]

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

**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 dual hydraulic pumps with an approximate total capacity of 37.0 g.p.m. The system shall be variable flow design monitored and controlled by the operator.

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 flow minimum of 32 gpm at 3,500 psi. to power the use of hammers, forestry heads, etc.

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 be fully enclosed with lockable doors and removable front window and vandal-proof screens shall be provided for all windows.

Complies: Yes [ ]  No [ ]

The side windows shall open and an opening “sky light” with sun shade in the top of the cab shall be included.

Complies: Yes [ ]  No [ ]

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. Seatbelt with warning indicator shall be included.

Complies: Yes [ ]  No [ ]

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

The cab shall include manufacturer’s standard 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 [ ]

|  |  |
| --- | --- |
| 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
* 12-volt power point
* Cab rock guards (vertical and horizontal bars to protect cab from debris)
* Bumper guards

Complies: Yes [ ]  No [ ]

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

The cab shall include 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 [ ]

|  |  |
| --- | --- |
| If No describe:  |       |
|       |

**Finish:**

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

|  |  |
| --- | --- |
| 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:**

**(Only to be priced if called for in the BID):**

**Hydraulic Mulcher:**

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 [ ]

The mulcher shall be 48” wide with a working width of 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:  |       | Pounds |

The mulcher shall require the excavator to produce a hydraulic flow or 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 and 2,890. The drum shall include 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 DVD 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 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:**

Bidders will need to send two copies of each of the following with their bid response.

1. Specification Questionnaire
2. Descriptive Literature