Attachment A- Knuckle Boom Crane and Truck Specifications

It is the intent of The Ohio State University to obtain formal bids to establish a contract for the purchase of one knuckle boom crane and truck to be transferred to the Ohio Department of Transportation under Agreement #33807. The primary purpose of the knuckle boom crane is to remove log jams and accumulated debris from bridge piers. The crane must be capable of reaching horizontally over a guard rail when parked adjacent to a 6-foot wide sidewalk, down vertically 50-feet, and beneath the bridge deck up to 15-feet to remove debris from the leading edge of hammerhead or tee type piers. Additionally, multiple crane attachments will be purchased to aid in the removal of debris, material handling, and tree care/removal.

Product Requirement Specifications:

1) One diesel powered, tandem axle, 66,000lb minimum flatbed truck with knuckle boom crane.

   a) Wheelbase and Frame:
      i) Frame reinforcement to meet knuckle boom manufacturers specifications.
      ii) Minimum of two tow hooks frame mounted on the front and rear of truck.

   b) Front Axle, Suspension and Steering:
      i) Set back axle with minimum of 20,000-pound rated axle with synthetic axle lube.
      ii) Front axle suspension shall be leaf spring suspension with shock absorbers.
      iii) Shall be equipped with power steering.

   c) Rear Axle and Suspension:
      i) Tandem rear axle shall be geared with 4.30 gear ratio and allow for 65-mph when fully loaded.
      ii) Axle shall be equipped with extended lube main driveline with half round yokes.
      iii) Rear axles shall be factory filled with synthetic axle lube.
      iv) Rear suspension shall be air ride suspension or equivalent with minimum rated capacity of 46,000lbs and equipped with shocks on both axles.

   d) Brakes:
      i) Brakes shall be Bendix ABS air disk brakes and automatic slack adjusters that meet or exceed axle manufactures weight rating and are equipped with dust shields.
      ii) Aluminum or stainless steel air tanks properly mounted to eliminate electrolysis between the tank and any steel components. Air tanks mounted after cab must be mounted between the frame rails not to extend below the frame rails more than 76.2 mm (3”)
      iii) Bendix air dryer model AD-9 with heater, or approved equal
      iv) Drain valve, automatic, Bendix DV-2 with heater, or approved equal
      v) Spring actuated parking brakes

   e) Transmission:
      i) Transmission shall be an Allison 4500 RDS automatic transmission or equivalent with PTO provision.
      ii) Transmission shall be equipped with transmission oil cooler.

   f) Engine:
i) Engine shall be six-cylinder turbo diesel Cummins engine with a minimum rating of 450-hp.

ii) Engine must meet or exceed all current Federal Emissions Standards (Tier 4 Final)

**g) Engine related components:**

i) Exhaust brake integral with turbo with ON/OFF dash mounted switch.

ii) Frame mounted battery box on the left side under the cab.

iii) Positive load disconnect switch for battery mounted outboard of driver’s seat inside cab.

iv) Right hand outboard under step mounted horizontal after treatment system with right hand B-pillar mounted vertical exhaust pipe, with end turned away from truck.

v) Fuel system shall have a minimum capacity of 100 gallons and be mounted on the left side of vehicle.

vi) Fuel tank(s) will be aluminum tanks with stainless steel strapping, properly mounted to eliminate electrolysis between the tank and any steel components.

**h) Wheels and Tires:**

i) Tires shall be manufacturer recommended tires for vehicle application and vehicle weight rating.

ii) Wheels shall be polished aluminum Alcoa Level 1 or approved equal disc type, ISO hub piloted, 10 hole, 229 mm (9.00”) D.C. width rim. Each rim must have a minimum rating of 4545 kg (10,000 lb.).

iii) Wheels should be properly mounted to eliminate electrolysis between wheels and any steel components.

**i) Cab:**

i) Conventional cab style equipped with air ride rear cab suspension and exterior grab handles on drivers and passenger side and shall be equipped with the following.

   (1) Daytime running lights.

   (2) Interior mounted fire extinguisher.

   (3) Heat and air conditioning.

   (4) Factory install AM/FM radio with Bluetooth for hands free cell phone.

   (5) Minimum of two 12-volt power receptacles mounted in dash.

   (6) DOT triangle reflector kit.

   (7) Adjustable tilt and telescoping steering column.

   (8) Electronic cruise control.

   (9) Backup alarm.

   (10) One dash mounted PTO switch with indicator and park/neutral interlock.

   (11) Cab paint shall be one solid color: white

   (12) Two sets of keys shall be supplied with ignition and doors keyed the same.

   (13) Two (2) steps shall be on both sides of the truck. All steps must meet all applicable OSHA requirements. All steps must be at least 610 mm (24”) long, 127 mm (5”) wide and 38 mm (1-1/2”) thickness. The top step shall be in the mid distance between the lower step and the cab floor level. The steps must be made of the same grip strut grating, diamond plate design, or approved equal.

   (14) All vehicles shall be equipped with noise suppression equipment, for two way radio operation, to suppress vehicle electrical and electronic generated radio frequency interference problems. Broad band vehicular generated noise shall not exceed ½ microvolt, as measured by the 12 BD SINAD method, at the two way radio receive antenna; further the vehicle shall not produce any frequency signal on any of O.D.O.T.’s
frequencies. The vendor is responsible for correcting any radiation or radio frequency interference problems encountered with any of the on-board systems of the supplied vehicles. O.D.O.T. radio frequencies are 45.72 MHZ, 45.76 MHZ, 47.02 MHZ, 47.10 MHZ, 47.22 MHZ, 47.30 MHZ, 47.34 MHZ, AND 47.40 MHZ.

(15) It is the responsibility of the vendor to ensure that operation of properly installed two way mobile 100 watt low band radio transmitters will not adversely affect the operation of the vehicle in any manner.

2) **Knuckle Boom Crane:**
   a) Crane shall be a Palfinger model PK 40002 or equivalent with a minimum boom reach of 84-feet without the use of manual extensions.
   b) Crane shall be capable of lifting a minimum of 1300-pounds at 84-feet.
   c) Crane must be 100% stable with a maximum of 3-feet of outrigger extension on the working side.
   d) Crane shall be equipped with continuous rotation turntable with gear box and dual motor design turning mechanism.
   e) Crane shall be equipped with infinitely variable stability control system allowing for maximum lifting capacity at any outrigger extension.
   f) Crane shall be coated with an electrostatic cathodic dip painting process for corrosion resistance.
   g) Crane shall come with two radio remote controls that are equipped with a capacity monitoring system and are capable of a wired connection if radio remote function is lost. Wired connection cable shall be supplied with all necessary connections.
   h) Crane shall come with a lifting hook with manufacturer recommended rating.
   i) Crane will be equipped with overload protection system that stops operation when load exceeds rating.
   j) Crane outriggers shall rotate to stow in the upright position.
   k) Outriggers should be capable of being set up on an elevated surface (e.g. curb, sidewalk) up to 10-inches tall.
   l) Composite outrigger stabilizer pads and storage devices shall be mounted in an easily accessible location with retaining device for securing pads while driving.
   m) Outriggers/stabilizers shall be controlled by two separate control stations on the same side of the truck as the outriggers they control.
   n) Crane hydraulic system shall be equipped with an oil cooler.
   o) Crane radio remote shall have a storage stand mounted in cab as well as a charging station.
   p) Crane hydraulic system shall have accessory lines mounted to the end of the crane with quick couplers.
   q) Hydraulic system must have correct flow rate and valve configuration to operate all attachments listed in “Additional Equipment” section below.

3) **Body:**
   a) Eighteen-foot steel black painted flatbed shall be mounted behind the crane.
   b) Body shall have complete DOT lighting kit with LED lights and include reflective perimeter tape on both sides and rear of body.
   c) Flatbed shall have maximum of 48-inch tall fixed headboard with binder bar storage on the side of the headboard and chain hangars installed along the rear facing section for storage.
   d) Flatbed shall have full length rub rails with reflective tape along entire perimeter and a minimum of five stake pockets per side and three on rear.
e) Flatbed shall have a minimum of one aluminum toolbox mounted curb-side under the bed, minimum dimensions of 36” long, 24” tall, 24” deep with lockable door.
f) Flatbed shall be equipped with mud flaps without logos.
g) Flatbed shall have a minimum of two adjustable LED flood lights attached to the top of the headboard.
h) Flatbed shall be equipped with a minimum of one underbody folding step on the right hand (passenger) side of the flatbed with handle.

4) Additional equipment:
a) Amber strobe light bar with a minimum width of 52-inches mounted and wired to the top of the cab and controlled by strobe switch in cab.
b) A minimum of four amber-colored strobes shall be installed at front and rear. Two lights shall be installed in the grille on the front and two at the rear bumper area. Strobes shall be wired in conjunction with the light bar switch in the cab.
c) Rear ICC bumper installed at back of truck with reflective tape full width of bumper.
d) The following attachments that are compatible with the knuckle boom crane include the following:
   i) Forestry grapple (Kinshofer KM 641 HPX or equivalent)
   ii) Grapple saw with a minimum cut width of 24-inches (Mecanil SG280 G2 or equivalent)
   iii) Earth auger (Kinshofer 7000TC or equivalent) with extensions
   iv) Worker basket
   v) Clamshell bucket (Kinshofer KM 604 HPX or equivalent)

5) Training:
a) Manufacturers training shall be provided with a minimum of four hours of operator and maintenance training on the knuckle boom loader and associated systems.
b) The Ohio State University reserves the right to video record the training sessions for training/retraining purposes.
c) Vehicle shall come with a minimum of 1-year full diagnostic program access through computer-based portals for OEM engine and transmission. For example: Allison Doc and Cummins Insite programs.

6) Alternates: Bids will be considered on units complying with the specifications. All alternates must be detailed in an attached letter to bid and the Manufacturer and Model clearly identified. Explanations must fully state what is to be furnished. All alternates must exceed specifications. The Ohio State University reserves the right to determine whether any proposed alternates are within the specifications.

7) Literature:
a) To aid in the evaluation of bids, all bidders are to furnish with this bid current published literature and Dealer’s specifications that best explains the unit offered, model and identification of the options that meet or exceed the specifications. Published literature shall include pictures and complete descriptive matter.
b) Bidders shall submit a copy of dealer’s build sheets with bid.

8) Manuals:
a) The successful bidder shall supply two copies of all parts lists, service, maintenance, and operation manuals upon delivery of the equipment to the Ohio Department of Transportation.