SPECIFICATION FOR A 65 TON OR 60 METRIC TON TELESCOPIC ROUGH TERRAIN CRANE

General Description: These specifications cover the furnishing and delivery of a diesel engine driven, 65 U.S. ton or 60 metric ton capacity, off-highway, telescopic crane. The crane shall be capable of traveling at a minimum of 23 mph (37.0 km/h), and can maneuver on rough ground under adverse conditions. The crane shall be completely equipped, ready for operation, and shall comply in all respects with the requirements specified hereunder. Crane offered shall be tested to meet the Society of Automotive Engineers (SAE) structural and stability requirements for cranes.

A. CARRIER

1. **Main Frame:** Main frame shall be all welded, double wall construction with gusseting and integral outrigger boxes. Frame and outrigger boxes to be 100,000 PSI (689.5 MPa) high strength steel. A storage box shall be integral with the frame.

2. **Main Outriggers:** Four (4) hydraulic, single beam with vertical jack outriggers. Vertical jack cylinders shall be equipped with integral holding valves. The outriggers shall be equipped with removable and stowable, lightweight, high strength, 23.5” (59.7 cm) square steel pontoons. All outrigger controls and sight level bubbles shall be mounted in operator's cab (upper). The outriggers shall have sufficient strength to provide full stability under all loading conditions, including the ability to raise the crane from ground contact. With outriggers extended and the crane in a level working position, there shall be no dependence upon the hydraulic system for support of any portion of the total weight imposed on the outriggers. The beams extend to 24’ (7.3 m) center to center and retract to within 9’ 6.75” (2.9 m). Crane shall have capacity charts with the outriggers in the retracted, intermediate, and fully extended positions.

3. **Steering and Axles:** 4x4x4 drive/steer for off highway travel. The front and rear axles are to be heavy-duty planetary drive/steer type. Two (2)-wheel, four (4)-wheel drive modes shall be provided. Steering is by means of a hydraulic system and shall provide two (2) wheel front, two (2) wheel rear, four (4)-wheel, and crab steering modes. All steering modes are to be controlled from the steering wheel. The front and rear axles to have a track of 99" (2.5 m) with 26.5x25 tires. Wheelbase of the crane to be no less than 14'-7” (4.4 m).

4. **Suspension:** The front axle to be rigid mounted to the frame. The rear axle is suspended on the oscillation cylinders with motion of the axle controlled by a four bar linkage and radius rods. The cylinders shall automatically lockout to stop oscillation for over-side and over-rear picking on tires when the upper swings 2.5° off centerline.

5. **Brakes:** Full hydraulic service brakes on all wheels with front and rear systems. Park/emergency brake to be spring applied, hydraulic released chamber on the front axle. It is to be activated by a switch located in the operator’s cab.

6. **Engine:** The engine shall be diesel powered, complete with electric starting system, alternator/voltage regulator, battery, liquid cooling system, lubricating oil filter, and dry type air filter. Engine shall be six (6) cylinder and four (4)-cycle turbocharged.
   - For North America – Displacement shall be at least 408 cu in (6.7L) with a peak torque of 730 ft.-lbs. (990Nm) @ 1,500 rpm and brake horsepower at least 270 (201kW) @ 2,000 rpm. The engine must meet the Tier 4f/Stage IV off – highway emissions requirements.
   - Outside North America – Displacement shall be at least 408 cu in (6.7L) with a peak torque of 730 ft.-lbs. (990Nm) @ 1,500 rpm and brake horsepower at least 270 (201kW) @ 2,000 rpm. The engine must meet the Tier 3/Stage IIIA off – highway emissions requirements.

7. **Transmission:** Power shift, integral mount, with a high and low range, and three (3) forward gears and three (3) reverse gears, thus providing six (6) forward and six (6) reverse gears. Engine mounted torque converter. Automatic front axle disconnected for two (2) wheel drive.

8. **Hydraulic System:** Four (4) pumps for the steering, outriggers, load hoist(s), swing, boom hoist, and telescope circuits shall be gear-type and shall have adequate pressure for operation. Hydraulic oil cooler to be supplied. Reservoir shall be all steel fabrication with internal diffusers for deaeration. Filter shall be located for easy replacement. Separate control valves shall allow simultaneous operation of crane functions.

9. **Fuel Tank**: An aluminum fuel tank shall be furnished having sufficient capacity for not less than eight (8) hours of normal operation.

10. **Tires:** The tires supplied shall be of the tire manufacturer's first line grade, be off-road profile type, tubeless, and shall have individual rated load carrying capacities equal to the maximum individual tire loadings imposed by the operation. The axles to consist of four (4) 26.5x25 tires.

11. **Lights:** Lights shall be installed on the front of the carrier and be of such intensity as to provide sufficient light for night operation of the crane if required. The lights shall be the manufacturer's standard sealed beam type and shall be secured in brackets capable of withstanding shock and vibration. The lighting package shall consist of two (2) front sealed beam type lights, two (2) front turn indicators, two (2) rear stop/turn indicators, and four (4) side marker lights.

12. **Reverse Signal Alarm:** The crane shall be equipped with a backup alarm that shall operate automatically when in the reverse gear. The alarm may be continuous or intermittent (not to exceed three (3) second intervals) and shall alarm anytime reverse gear is selected.

13. **Fenders:** Fenders are to be provided for each wheel and shall have a non-slip texture on the walking surfaces.

14. **Access:** Six (6) locations should provide access to the top of the carrier deck and operator's cab.

15. **Lubrication:** Moving parts requiring lubrication shall have means provided for such lubrication and be lubricated prior to delivery. All lubricant receptacles (crankcase, transmission, etc.) and hydraulic systems shall be filled to proper operating level before delivery. The crane shall have all lubricants and fluids identified in the Operator's Manual.

B. UPPERSTRUCTURE

Lifting Capacity: The rated capacity of the crane shall be one of the following:

- Imperial - 130,000 lbs. @ 9 ft. radius with a minimum retracted boom, outriggers fully extended, and 360º rotation. At a boom length of 55 ft. and a radius of 40 ft., the lifting capacity shall be a minimum of 26,400 lbs. with one of the boom extend modes (outriggers fully extended: 360º rotation). Crane capacities shall not exceed 85% of the tipping load. A permanent Crane Rating Manual located in the cab near and easily visible to the operator, shall be provided showing rated lifting capacities at various boom radii for various boom lengths, with and without outriggers. Manufacturer's standard ratings shall not be raised, or special ratings developed to meet this specification.
- Metric – 60 000kg @ 2.5m radius with a minimum retracted boom, outriggers fully extended, and 360º rotation. At a boom length of 16.8m and a radius of 12m, the lifting capacity shall be a minimum of 10 900kg with one of the boom extend modes (outriggers fully extended: 360º rotation). Crane capacities shall not exceed 75% of the tipping load. A permanent Crane Rating Manual located in the cab near and easily visible to the operator, shall be provided showing rated lifting capacities at various boom radii for

various boom lengths, with and without outriggers. Manufacturer's standard ratings shall not be raised, or special ratings developed to meet this specification

1. **Boom:** The main boom shall be sectional, of formed construction, and fully powered to at least 115 ft. (35.0 m). An additional stowable attachment shall be included to make boom length at least 173 ft. (52.7 m) long. Boom telescope sections shall be supported by wear shoes both vertically and horizontally to prevent metal-to-metal contact. The boom extend mode shall be a minimum speed of 113 seconds.

2. **Boom Nose:** Reinforced hi-strength steel construction. Four (4) non-metallic load bearing sheaves, 16.5" (41.9 cm) root diameter, and two (2) non-metallic idler sheaves, 16.5" (41.9 cm) root diameter. Sheaves shall be smooth and free of surface defects, which could damage the rope. Removable rope guards for easy reeving and rope dead ends shall be provided on each side of the boom nose.

3. **Boom Elevation:** One double acting cylinder with integral holding valve shall be provided for controlling boom elevation from -3º to 78º. The boom hoist up mode (10 ° - 70 °) shall be a minimum speed of 52 seconds.

4. **Swing:** A bi-directional hydraulic swing motor shall provide for 360º continuous smooth rotation at 2.0 rpm. A one-position swing lock shall be capable of positively locking the superstructure in the “over the front” position for travel and for “on tire” lifts. An additional one-position swing lock shall be capable of positively locking the superstructure in the "over the rear" position for travel. The swing brake shall be foot-activated for precise control and shall be capable of locking the superstructure in any 360º location.

5. **Operator’s Cab:** The cab shall be fully enclosed. It shall be fabricated from galvaneal steel and shall have sufficient windows and doors to permit a minimum of 180º visibility for the operator. All glass shall be tinted safety glass held in place by rubber channels for easy replacement. Windshield wiper/washer for front and top window glass shall be provided. The right side and back windows shall open for ventilation. Cab doors shall be adequately restrained from accidentally opening or closing while traveling or operating the crane and shall be capable of being locked in a closed position when desired. The cab shall contain an diesel fired, warm water heater and defroster that shall have sufficient capacity to effectively defrost the windshield and heat the cab. The cab shall also have provisions for air conditioning. An adjustable and comfortable operator's seat shall be provided and shall be located for maximum unobstructed visibility of the work area by the operator without leaving the seat and within easy reach of the joystick controllers and pedals. The cab shall be isolated from vibration by rubber mounts.

6. **Controls:** All crane functions shall be controlled by the least possible number of hand controllers and foot pedals necessary for efficient operation. The joystick controllers and pedals shall be conveniently located and arranged for easy access and operation by the operator, when in a seated position, and they shall not obstruct the operator's view of work. All operating controls shall be identified, either by the name of the control or a symbol. Controls shall also have arrows or appropriate markings showing the direction of movement for operation. Hand-operated controllers shall be provided for swing, load hoist(s), and boom elevation. Foot operated controls shall be provided for swing brake, service brake, boom telescope, and engine throttle. Other cab controls include heater controls, outrigger sequence controls and sight level bubble, electric windshield wiper, electric horn, lights, and engine start/stop.

7. **Upper Cab Instrumentation:** Dash mounted; backlighted gauges shall include hydraulic oil temperature, fuel level, water temperature, transmission temperature, and tachometer. A boom angle indicator shall be located such that the angle reading is plainly visible from the operator's seat.

8. **Cameras:** Viewing monitor shall be conveniently located and arranged for easy access and operation by the operator in the operator's cab. The monitor should display images on the right side when swinging the upper structure and operation of the hoist system.

9. **Lights:** Lights shall be installed on the operator's cab and shall always face the direction of the boom and be of such intensity as to provide sufficient light for night operation of the crane if required. The lights shall be the manufacturer's standard sealed beam type and shall be secured in brackets capable of withstanding shock and vibration. The lighting package shall consist of two sealed beam type lights.

10. **Counterweight:** The counterweight shall be removable and pinned to the superstructure.

11. **Load Hoist System:** The hoist shall be equipped with a piston type, two (2) speed hydraulic motor and automatic brake; power up/power down mode of operation. The hoist shall be driven through a planetary reduction unit for positive operator control under all load conditions. Maximum permissible single line pull shall be not less than 17,182 lbs. (7 793.6 kg) and the maximum line speed shall be not less than 459 fpm (139.9 m/min.) on a 13" (33.0 cm) diameter grooved drum. The auxiliary winch shall be sized equal to the main winch for equal line speeds and pulls. Drum rotation indicators to be included and provisions for third wrap indicators.

12. **Wire Rope:** The wire rope shall be 3/4" (19 mm) diameter (6x19 class), Warrington Seale, EIPS, IWRC, preformed, right regular lay.

13. **Size:** The crane furnished shall not exceed the following dimensions:
    - Overall width with outriggers retracted – 10'-7" (3.2 m)
    - Overall length without boom - 27' 2" (8.3 m)
    - Overall height 12' 2" (3.7 m)

14. **Treatment and Painting:** All painted components shall be cleaned, treated, pre-painted, and oven baked prior to assembly, in accordance with the manufacturer's standard practices and color(s).

15. **Servicing:** Upon delivery, the equipment shall be serviced by the Seller for satisfactory operation. Servicing shall include greasing and oiling, filling of oil reservoirs to proper levels, removal of unnecessary shipping tags and instructions, and other necessary and suitable servicing required for normal operation.

16. **Testing:** Upon delivery, the Seller shall perform such operational tests as may be required to fully demonstrate to the satisfaction of the Contracting Officer that the crane will perform the functions which are specified in these specifications. All equipment failing to perform the operational function indicated properly will be rejected.

17. **Technical Publications and Drawings:** One (1) copy of an Operator's Manual, and one (1) copy of a Parts Manual for all parts of the crane and carrier shall be provided.

QUESTIONNAIRE FOR
65 TON OR 60 METRIC TON ROUGH TERRAIN CRANE

1. Make_____ Model_____

   Manufacturer_____

Lift Capacity: attach Load Chart for Crane and Boom offered.

On Outriggers - 360 Degrees

Imperial Units			**Metric Units**		
Boom Length	Radius	**Capacity**	Boom Length	Radius	**Capacity**
38 ft	9 ft		11.58m	2.5m	
55 ft	40 ft		13.7m	10m	
75 ft	15 ft		16.8m	4m	
85 ft	20 ft		22.9m	20m	

2. **Boom:** length extended_____ retracted_____

   Number of sections_____

   Number of power extendable sections_____

   Can boom be power extended under full load? _____

   Boom elevation_____degrees to_____degrees

3. **Load Hoist:** Make_____ Model_____

   Drum Capacity_____ feet of_____ (Size) Wire Rope

   Maximum permissible bare drum line pull_____

   Maximum full drum line speed_____

   Maximum number of line parts that can be used with equipment furnished

   _____

   Diameter, construction class, and length of load line wire rope to be

   furnished_____

   Breaking strength of the wire rope_____

4. **Carrier:**
   Engine: Make_____ Model_____

   Transmissions: Make_____Model_____

   4x4 Drive (Yes or No)_____

   Drive Axles: Make_____ Model_____

   - Axle Mfg.'s rated capacity - static_____
   - Axle Mfg.'s rated capacity – 5 MPH (8 KPM)_____
   - Gear Ratio_____

   Available Tractive Effort (at stall)_____

   Gradeability (at stall)_____

   Front Tire - Size_____ Rated Capacity_____

   Lights furnished (list)_____

   _____

   _____

5. **Weights and Dimensions** in Travel Configuration:
   Dimensions are per definitions of SAE J1234:

   Height_____ Width_____

   Length Incl. Boom_____ Chassis only_____

   Wheel Base_____

   Vehicle Turn Diameter (Wall to Wall) (Per SAE J695b)
   _____

Gross Weight_____

- Front Weight_____
- Rear Weight_____

6. **Outriggers** - Overall Width Fully Extended_____

   Is there a mechanical or hydraulic safety lock? _____

7. **Hydraulic Filter** - Make_____ Model_____

8. **Testing** - Is the crane tested and verified in accordance with:

   - SAE J1063 (Yes or No)_____
   - SAE J765 (Yes or No)_____

Submitted by_____

Title_____