

SPECIFICATIONS.

The following specification details OSHA and ANSI annual testing and inspection for aerial, digger derrick, under-bridge
Equipment inspection and crane trucks:

1.0 AERIAL PERSONNEL DEVICE TEST AND INSPECTION REQUIREMENTS

- 1.1 Aerial personnel device shall be inspected and tested per ANSI/SIA A92.2 most current version and shall satisfy OSHA.
- 1.2 Testing and inspecting shall include the following, but not be limited to the following, particularly when OSHA and/or ANSI/SIA A92.2 most current version calls for more or different inspection and testing:

I. STRUCTURAL TESTS

- A. Visual Inspection:** A complete inspection of accessible areas including:
 1. Outriggers; Pads, structure, welds, bolts, hoses, cylinders, valves, pins and retainers.
 2. Chassis; Truck frame, aerial sub-frame, suspension, PTO, pintle hook, and components of the brake, steering, electrical, air, hydraulic, exhaust, and cooling systems.
 3. Pedestal; Mounting bolts and welds, pedestal structure, diagonal brace, attachment welds or pins, hydraulic swivel joint, hydraulic components, swing drive gearbox mounting bolts, backlash between swing pinion or bullgear, electric collector ring and brushes and lower control operation.
 4. Rotation Bearing; Upper and lower bearing attachment weld and bolts, vertical movement of bearing, and proper torque on accessible bearing bolts.
 5. Turntable; Turntable structure, bucket leveling cables, leveling cylinders, compensating chains or sprockets, and hydraulic system components.
 6. Lower Boom; Boom structure, welds, lift cylinders and attachment, hydraulic system, leveling cables or rods, upper or extend cylinder and attachment, push links, boom rest supports, tie-down straps, lower insulator and mounting, extension roller assembly and wear pads.
 7. Elbow; Elbow structure, hydraulic hoses and leveling cables.
 8. Upper Boom (Extension); Structure, welds, leveling cables or rods, wear pads, upper insulator and mounting, hydraulic lines and components, jib structure and mounting, tool circuit hoses and fittings, pole claw arms and mounting brackets.
 9. Platform (Bucket); Mounting bracket bolts, leveling system, exterior condition, control operation and hydraulic lines and components.
 10. Digger and Auger; digger mounting arm and housing, gearbox, auger, digger wind-up bracket or rope, auger stop bracket, lock mechanism and control operation.
 11. Winch; Mounting brackets, bolts, pins; gearbox, hydraulic components, load line, and controls.
 12. General; Load rating chart, electrical hazard placards, MADDCC placards and upper or lower control operation placards.

The visual inspection includes removal of inspection cover plates as necessary to do a thorough job.

- B. Acoustic Emission (AE) Test:** AE is the accepted industry method for testing fiberglass and steel structures. The AE test includes attaching sensitive sensors to the structural fiberglass and metal components from the bucket down to the outrigger or chassis subframe. A test load of 1-1/2 or 2 times the rated load (specified by customer) is applied to the boom. A computer system monitors sounds emitted by defects that are growing during the test load. The computer selects the critical noise emissions and prints a summary report. A test load of 1-1/2 times rated load will be applied to the boom or

bucket. A print out showing the result will be attached to the test report for each unit that it applies to. Test results are to be reviewed by the engineering staff from the testing company.

- C. Magnetic Particle Inspection:** Magnetic particle is a nondestructive test method used to identify surface cracks on ferrous material. It is performed on all critical welds, plates and castings of items listed in Part A during the visual inspection.
- D. Dye Penetrant Inspection:** Dye Penetrant is a nondestructive test method used to identify surface cracks and works on any structural surface including all critical welds, plates, castings made of non-ferrous material and any area requiring verification in Part C or Part E.
- E. Ultrasonic Inspection:** Ultrasonic is a nondestructive test method used to detect flaws in accessible critical pins. Use of ultrasonic reduces the number of pins that have to be removed for inspection. Pins with flat end surfaces and do not have drilled holes are best suited for ultrasonic.
- F. Torque Testing:** Torque testing all critical fasteners in accessible areas including upper and lower rotation bearing, swing gearbox, boom connections, and platform mounting.

II. FUNCTIONAL AND OPERATIONAL TEST

A functional and operational test is performed to check the operation of controls, bearings, pins, bushings, cylinders, holding valves, bucket leveling mechanisms, outriggers, etc. This test will also find worn swing bearings or gearboxes, worn pins or bushings, and loose fasteners critical to the operation of the aerial.

III. DIELECTRIC TEST

A DC dielectric test as specified by ANSI standards. The dielectric test verifies the electrical insulating strength in the FRP upper and lower booms, bucket, liners, FRP extensions on digger derricks, tool circuits, and upper control system.

IV. REPORT AND CERTIFICATION

Defects found during the inspection and tests are classified for degree of severity and printed on a computerized report. If the inspection reveals that repairs or rework are required by the customer, details of the work will be outlined on the report. The Contract Vendor's technician will review the initial report with the customer's authorized representative (CAR). A signed and dated copy of the initial test report listing any defects is left with the CAR. If repairs or rework need to be completed before the equipment is certified, the Contract Vendor will provide any additional inspections needed for the equipment to be certified.

The final test is reviewed by the Contract Vendor's staff engineers and the final report is mailed to CAR. The Contract Vendor retains a copy of the test report on file. The final test/inspection report must be mailed to the CAR within 30 days of the final inspection.

2.0 DIGGER DERRICK TEST & INSPECTION REQUIREMENTS

- 2.1 Digger derrick units shall be inspected and tested per ANSI/SIA A10.31 most current version and shall satisfy OSHA.
- 2.2 Testing and inspection shall be as stated in Specification 1.2 and shall include inspection of digger auger assembly.

3.0 BRIDGE INSPECTION/MAINTENANCE DEVICE TEST AND INSPECTION REQUIREMENTS

- 3.1 Bridge inspection/maintenance device shall be inspected and tested per ANSI/SIA A92.8 most current version and shall satisfy OSHA.
- 3.2 Testing and inspection shall include the following but not be limited to the following, particularly when OSHA and/or ANSI/SIA A92.8 most current version calls for more or different inspection and testing:

I. STRUCTURAL TESTS: A complete inspection of accessible

A. Visual Inspection: A complete inspection of accessible areas including:

1. Axle locks and frame mounted counterweight. Outriggers: Pads, structure, welds, bolts, hoses, cylinders, valves, pins and retainers.
2. Chassis: Truck frame, aerial sub-frame, suspension, PTO, pintle hook, and components of the brake, steering, electrical, air, hydraulic, exhaust, cooling systems, auxiliary engine, generator, and hydraulic pump.
3. Pedestal: Mounting bolts and welds, pedestal structure, diagonal brace, attachment welds or pins, hydraulic swivel joint, hydraulic components, swing drive gearbox mounting bolts, backlash between swing pinion or bullgear, electric collector ring and brushes and lower control operation.
4. Rotation Bearing: Upper and lower bearing attachment weld and bolts, vertical movement of bearing, and proper torque on accessible bearing bolts on primary and secondary turntables.
5. Turntable: Turntable structure, bucket leveling links, and hydraulic system components.
6. Lower Boom: Boom structure, welds, lift cylinders and attachment, hydraulic system, links, boom rest supports, tie-down straps.
7. Elbow: Elbow structure, hydraulic hoses and leveling links.
8. Upper Boom (Extension): Boom extension cylinders, structure, welds, wear pads, hydraulic lines and components, jib structure and mounting, tool circuit hoses and fittings.
9. Platform (Bucket): Mounting bracket bolts, leveling system, and exterior condition, control operation and hydraulic lines and components.
10. General: Load rating chart, electrical hazard placards, MADDCC placards and upper or lower control operation placards.

The visual inspection includes removal of inspection cover plates as necessary to do a thorough job.

B. Acoustic Emission (AE) Test: AE is the accepted industry method for testing fiberglass and steel structures. The AE test includes attaching sensitive sensors to the structural fiberglass and metal components from the bucket down to the outrigger or chassis subframe. A test load of 1-1/2 times rated load will be applied to the boom or bucket. A print out showing the result will be attached to the test report for each unit that it applies to. Test results are to be reviewed by the engineering staff from the testing company.

C. Magnetic Particle Inspection: Magnetic particle is a nondestructive test method used to identify surface cracks on ferrous material. It is performed on all critical welds; plates and castings of items listed in Part A during the visual inspection.

D. Dye Penetrant Inspection: Dye penetrant is a nondestructive test method used to identify surface cracks and works on any structural surface including all critical welds, plates, castings made of non-ferrous material and any area requiring verification in Part C or Part E.

E. Ultrasonic Inspection: Ultrasonics is a nondestructive test method used to detect flaws in accessible critical pins. Use of ultrasonics reduces the number of pins that have to be removed for inspection. Pins with flat end surfaces and do not have drilled holes are best suited for ultrasonics.

F. Torque Testing: Torque testing all critical fasteners in accessible areas including upper and lower rotation bearing, swing gearbox, boom connections, and platform mounting.

II. FUNCTIONAL AND OPERATIONAL TEST

A functional and operational test is performed to check the operation of controls, bearing, pins, bushing, cylinders, holding valves, bucket leveling mechanisms, outriggers, boom and turntable limit systems, axle locks and frame mounted counterweight. This test will also find worn swing bearings or gearboxes, worn pins or bushings, and loose fasteners critical to the operation of the aerial.

III. REPORT AND CERTIFICATION

Defects found during the inspection and tests are classified for degree of severity and printed on a computerized report. If the inspection reveals that repairs or rework are required by the customer, details of the work will be outlined on the report. The Contract Vendor's technician will review the initial report with the customer's authorized representative (CAR). A signed and dated copy of the initial test report listing any defects is left with the CAR. If repairs or rework need to be completed before the equipment is certified, the Contract Vendor will provide any additional inspections needed for the equipment to be certified.

The final test is reviewed by the Contract Vendor's staff engineers and the final report is mailed to CAR. The Contract Vendor retains a copy of the test report on file. The final test/inspection report must be mailed to the CAR within 30 days of the final inspection.

4.0 TRUCK MOUNTED HYDRAULIC CRANE TEST AND INSPECTION REQUIREMENTS

- 4.1 Truck mounted hydraulic cranes with 1-9 ton capacity shall be inspected and tested per ANSI B30.5 most current version and shall satisfy OSHA.
- 4.2 Testing and inspection shall include the following but not be limited to the following, particularly when OSHA and or ANSI B-30.5 most current version calls for more or different inspection and testing:

I. STRUCTURAL/MECHANICAL

- A. Visual Inspection:** Complete inspection of:
 - 1. Chassis: Truck frame, sub-frame/mounting, steering elements, steering gearbox, suspension, drive line and joints, PTO, brake hoses/tubing, brake (Microbrake) lock assembly, trailer hitch/pintle hook, electrical system, hydraulic/electrical components, exhaust system and cooling system.
 - 2. Outriggers: Pads, structure/welds, beam/housing, bolts, hoses, fittings, cylinders, check valves, pins and retainers.
 - 3. Pedestal: Mounting bolts/welds, pedestal structure, attachment welds/bolts/pins, hydraulic/air/electric swivel joint, hydraulic components, swing drive gear box/mounting bolts, and backlash between swing pinion/bullgear.
 - 4. Rotation Bearing: Upper/lower bearing attachment weld/bolts, vertical movement of bearings, and proper torque on accessible bearing bolts.
 - 5. Drive Train: Gear wear, lubrication, guards, hydraulic components.
 - 6. Drum Shafts: Main hoist, swivel, etc., drum conditions, clutch/brake lining, air and hydraulic lines/components.
 - 7. Wire Ropes: Check for wear and broken wires, lubrication, end connections, pins, clips and spreaders.
 - 8. Load Blocks: Hook condition, safety latch, sheaves, bearings, becketts, clips, swivel lock and structure.
 - 9. Boom-Jib-Lower Boom-Upper Boom: Structure/welds, pin end castings, pins, bolts, keepers, lift cylinders and attachments, hydraulic system, upper or extended cylinder and

attachment, boom rest supports, tie-down straps, sheaves, rope guides, boom stops, wear pads and extension roller assemblies.

The visual inspection includes removal of inspection cover plates as necessary to do a thorough job.

- B. Magnetic Particle Inspection:** All critical welds, plates and castings of items listed in Part A during the visual inspection. Magnetic particle is used to identify surface cracks on ferrous material.
- C. Dye Penetrant Inspection:** All critical welds, plates, castings made of non-ferrous material and any area requiring verification in Part B. Dye penetrant is used to identify surface cracks and works on any structural surface.
- D. Ultrasonic Inspection:** All accessible pins including outriggers, pedestal, and boom. Ultrasonics is a test method used to detect flaws in pins. The pins being tested must be accessible, have flat end surfaces and not have grease fittings. Use of ultrasonics limits the number of pins that might otherwise have to be removed for inspection.

II. FUNCTIONAL AND OPERATIONAL TEST

A functional and operational test is performed to check the operation of controls, bearings, bushings, pins, cylinders, gears, shafts, air/hydraulic/mechanical components, holding valves, parking brakes/dogs, boom stops, angle/load indicators, outriggers, and overall operation of crane.

III. LOAD TESTS

Load tests are performed as required to meet OSHA/ANSI requirements or per requestor's specifications.

IV. REPORT AND CERTIFICATION

Defects found during the inspection and tests are classified for degree of severity and printed on a computerized report. If the inspection reveals that repairs or rework are required by the customer, details of the work will be outlined on the report. The Contract Vendor's technician will review the initial report with the customer's authorized representative (CAR). A signed and dated copy of the initial test report listing any defects is left with the CAR. If repairs or rework need to be completed before the equipment is certified, the Contract Vendor will provide any additional inspections needed for the equipment to be certified.

The final test is reviewed by the Contract Vendor's staff engineers and the final report is mailed to CAR. The

Contract Vendor retains a copy of the test report on file. The final test/inspection report must be mailed to the CAR within 30 days of the final inspection.

5.0 OTHER REQUIREMENTS

- 5.1 The Contract Vendor shall prepare the equipment by reasonably cleaning it prior to inspection.
- 5.2 Testing and inspecting technician shall be a Certified Level 2 SNT-TC-IA NDT Technician.
- 5.3 The Contract Vendor must have its representative, and all the appropriate people, available after the test to review the test results and to ask questions.
- 5.4 For any Mn/DOT equipment that is tested and inspected an additional copy of the final report shall be submitted to the CAR.

CONTRACT PRICE. Prices shall be firm for the initial term of the Contract. Prices listed in your response to this solicitation must take into consideration all inherent costs of providing the requested services. The Contract Vendor agrees to pay any and all fees including, but not limited to, staffing, travel expenses to and from the inspection site and all other incidentals. The State will not pay any additional charges beyond the price(s) listed in the response, unless otherwise provided for by law or expressly allowed by the terms of the solicitation.

REPORTING. All inspection reports – both the initial and final – must be submitted per the instructions and within the times outlined in the specifications. **Failure to provide the final reports within the time frame outlined may cause invoice payment to be withheld until the final reports are received by the customer.**

INSPECTION SCHEDULE. The Contract Vendor must be able to provide testing and inspection services two ways:

Regular Scheduled Test/ Inspection – Customer provides the Contract Vendor with a two week lead time to provide test and inspection services. The Contract Vendor will receive notification from the customer and confirm a mutually agreed date for the services to be completed. If the Contract Vendor fails to meet the mutually agreed inspection date, the customer reserves the right to purchase the services on the open market and charge any difference in actual costs back to the Contract Vendor.

Emergency Test/Inspection – Customer contacts the Contract Vendor for emergency services to be completed within three to five working days of contact. The Contract Vendor will receive notification from the customer and confirm a mutually agreed date for the services to be completed. If the Contract Vendor fails to meet the mutually agreed inspection date, the customer reserves the right to purchase the services on the open market and charge any difference in actual costs back to the Contract Vendor.

INSTRUCTIONS FOR COMPLETING THE PRICE SCHEDULE. Responders shall provide two prices by service type and equipment type:

Regular Scheduled Services
Emergency Services

Responders shall use the State Price Schedule included with the Solicitation. Failure to submit its offer on the required Price Schedule may be cause for the offer to be rejected.