STATE OF MINNESOTA
TESTING AND INSPECTION, AERIAL UNITS, CRANES, ETC.
CONTRACT RELEASE T-546(5) EVENT 2000007886
SPECIFICATIONS

1.0 SCOPE

The following specification details OSHA and ANSI annual testing and inspection for aerial, digger derrick, under-bridge, scissor lifts, manually propelled man lifts, overhead cranes, and automotive lifts. The following that apply must be met along with any other relevant OSHA, ANSI, ALI, ASME, Federal and State regulations.

I. <u>Structural Tests</u>

A. Visual Inspection - A complete inspection of accessible areas include:

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 bull gear, 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. Boom-Jib-Lower Boom-Upper Boom: boom structure, welds, pin end castings, pins, bolts, keepers, lift cylinders and attachment, hydraulic system, leveling cables or rods, upper or extend cylinder and attachment, push links, boom rest supports, tie-down straps, sheaves, rope guides, boom stops, wear pads and extension roller assemblies, 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.

13 Drive Train: gear wear, lubrication, guards, hydraulic components.

14 Drum Shafts: main hoist, swivel, drum conditions, clutch/brake lining, air and hydraulic lines/components.

15 Wire Ropes: check for wear and broken wires, lubrication, end connections, pins, clips and spreaders.

16 Load Blocks: hook condition, safety latch, sheaves, bearings, beckets, clips, swivel lock and structure.

17 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.

18. General: load rating chart, electrical hazard placards, MADDDC placards, and upper or lower control operation placards.

The visual inspection includes removal of inspection cover plates as necessary to ensure a complete inspection.

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 sub frame. 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 and made available to the Customer.

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 ultrasound 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 the (CAR). The Contract Vendor retains a copy of the test report on file. The final test/inspection report must be mailed to the Customer's Authorized Representative (CAR) within 30 days of the final inspection, unless mutually agreed upon by the CAR and the Contract Vendor.

2.0 Aerial Personnel Device Test and Inspection Requirements

2.1 Aerial personnel device must be inspected and tested per ANSI/SIA A92.2 most current version and must satisfy OSHA.

2.2 Testing and inspecting must include, but not limited to the above*, particularly when OSHA and/or ANSI/SIA A92.2 most current version calls for more or different inspection and testing.

3.0 Digger Derrick Test & Inspection Requirements

3.1 Digger derrick units must be inspected and tested per ANSI/SIA A10.31 most current version and must satisfy OSHA**.**

3.2 Testing and inspecting must include, but not limited to the above*, particularly when OSHA and/or ANSI/SIA A92.2 most current version calls for more or different inspection and testing of digger auger assembly.

4.0 Bridge Inspection/Maintenance Device Test and Inspection Requirements

4.1 Bridge inspection/maintenance device must be inspected and tested per ANSI/SIA A92.8 most current version and must satisfy OSHA.

4.2 Testing and inspecting must include, but not limited to the above*, particularly when OSHA and/or ANSI/SIA A92.8 most current version calls for more or different inspection and testing.

5.0 Truck Mounted Hydraulic Crane Test and Inspection Requirements

5.1 Truck mounted hydraulic cranes with 1-9 ton capacity must be inspected and tested per ANSI B30.5 most current version and must satisfy OSHA.

5.2 Truck mounted hydraulic cranes with 10-50 ton capacity must be inspected and tested per ANSI section B30 most current version and must satisfy OSHA.

5.3 Testing and inspecting must include, but not limited to the above*, particularly when OSHA and/or ANSI section B-30 most current version calls for more or different inspection and testing.

6.0 Manual Propelled Man Lifts and Scissor Lifts

6.1 Man lifts and scissor lifts must be tested par ANSI A92.6 most current version and must satisfy OSHA.

6.2 Testing and inspecting must include, but not limited to the above*, particularly when OSHA and/or ANSI A92.6 most current version calls for more or different inspection and testing.

7.0 Overhead Cranes

7.1 Overhead cranes (including all underhung, gantry and monorails) must be tested per ASME B30 requirements and must satisfy all OSHA and ANSI requirements.

7.2 Testing and inspecting must include, but not limited to the above*, particularly when ASME B30 most current version calls for more or different inspection and testing.

8.0 Automotive Lifts

8.1 Automotive lifts must be tested per ANSI/ALI ALOIM 2008 R2013 standard requirements and must satisfy OSHA, ANSI requirements.

8.2 Testing and inspecting must include, but not limited to the above*, particularly when ANSI/ALI ALOIM 2008 R2013 most current version calls for more or different inspection and testing.

9.0 Additional Requirements

9.1 The Contract Vendor must prepare the equipment by reasonably cleaning it prior to inspection.

9.2 The Contract Vendor's Testing and Inspecting Technician must be a Certified Level 2 SNT-TC-IA NDT Technician. The Contract Vendor's inspectors for the automotive lifts must have a certification level approved by ANSI under ANSI/ALI ALCTV.

9.3 The Contract Vendor must have its representative, and all the appropriate people, available for questions after the test to review the test results and to ask questions.

9.4 For any MnDOT equipment that is tested and inspected, an additional copy of the final report must be submitted to the Customer's Authorized Representative (CAR).

10.0 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 30 day time frame outlined may cause invoice payment to be withheld until the final reports are received by the customer.**

11.0 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 or more 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.

12.0 Instructions For Completing The Price Schedule - Responders must provide two prices One for Service type and One for Equipment type on Excel State Price Schedule:

Regular Scheduled Services
Emergency Services

Responders must use the Excel State Price Schedule included with the Solicitation. Responders only need to fill in the yellow section of the Excel sheet. **Responder may not submit a PDF copy of the Excel State Price Schedule. Responders must use the working copy of the Excel State Price Schedule attached to the solicitation to submit their bids on**. Failure to submit its offer on the required State Excel Price Schedule may be cause for the offer to be rejected.

***Refers to item I, II, III, IV**