UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

Aerial Lift and Scaffolding Guidelines

January 2023

UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

Aerial Lift and Scaffolding Guidelines

TABLE of CONTENTS

Appendices

UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

Aerial Lift and Scaffolding Guidelines

I. General

Aerial lifts and scaffolding are commonly used in construction, maintenance, inspection, and repair services to lift University employees to an elevated work position. Proper operation and use of aerial lifts and scaffolding can make the completion of tasks at elevation safer and more efficient. However, unsafe use, operation, and lift work practices can result in serious injury. This guideline outlines general, operating, maintenance, inspection, and training requirements governing safe aerial lifts and scaffolding used at the University of Northern Colorado.

II. Roles and Responsibilities

For these guidelines to be effective, employees working on subject equipment shall understand and take an active role in meeting these responsibilities and guidelines. Due to the potential hazards associated with various types of work activities, the specific responsibilities outlined below shall be followed.

A. Managers and Supervisors

The following are the responsibilities of the managers and supervisors under the aerial lift and scaffolding guidelines:

- Understand hazards specific to aerial lifts and scaffolding.
- Ensure modifications are not made to aerial lifts without the manufacturer's prior approval.
- Ensure signs, caution tape, barriers/fences, and other means of diverting. pedestrian traffic is in place before scaffolding or aerial lift use.
- Ensure that employees attend and complete all required training.
- Must retain completed lift inspection reports for a minimum of three years.

B. Environmental Health & Safety

The following are the responsibilities of the Environmental Health & Safety Department:

- Evaluate and update the written Aerial Lift and Scaffolding Guidelines.
- Provide training as requested, for supervisors and employees.
- Collect and maintain completed inspection forms.

C. Operator

The following are the responsibilities of the operator under the aerial lift and scaffolding guidelines:

- Understand hazards specific to aerial lifts and scaffolding.
- Ensure modifications are not made to the equipment without the manufacturer's prior approval.
- Perform lift inspections before each use (See Appendices A, B, and C) and submit the completed form to the appropriate party as indicated on the form.
- Immediately report damage or irregularities of lift or scaffolding operations to their supervisor.
- Immediately report worn or damaged personal fall arrest system components to the supervisor.
- Attend and complete the required training.

III. Types of Aerial Lifts

There are multiple types of aerial lift equipment. Below are some different types of lifts and special hazards for each lift:

A. Bucket Truck

Bucket trucks and cherry pickers are types of aerial lifts that contain a bucket-like platform attached to a long arm (boom). As the arm unfolds, the platform rises.
Special Hazards: Insulating integrity, fall from above, tip over, collision, electrocution.

B. Scissor Lifts

Scissor lifts use cris-crossed braces that extend and stretch upward.
Special Hazards: Collision, fall from above, tip over, electrocution.

C. Articulated Boom Lift

Articulating boom lifts can extend up and over machinery and other obstacles and can reach elevated positions not easily approached by a straight boom lift.

Special Hazards: Insulating integrity, fall from above, tip over, collision, electrocution

D. Telescoping Boom Lift

Telescoping boom lifts are used for applications that require high-reach capability.
Special Hazards: Insulating integrity, fall from above, tip over, collision, electrocution

E. Man Lift

Manlifts consist of platforms or brackets and accompanying handholds mounted on, or attached to an endless belt, operating vertically in one direction only and being supported by, and driven through pulleys, at the top and bottom. These man lifts are intended for the conveyance of persons only. This section applies to man lifts used to carry only personnel trained and authorized by the employer in use.

Special Hazards: Insulating integrity, fall from above, tip over, electrocution

IV. Operating Requirements for Aerial Lifts

Aerial lifts must be cared for according to the manufacturer's requirements. Aerial lifts must be operated and used following OSHA and American National Standard Institute (ANSI) standards.

A. Street Travel

Before traveling on open roadways, operators must make appropriate arrangements. Before travel, aerial ladders, booms, and towers must be secured in the lower traveling positions by the locking devices provided or by other equally effective means. Locking pins must be in place as directed by the manufacturer.

B. Vehicle Positioning

Before performing a lift, the vehicle in which the lift is mounted needs to be positioned in such a way as to allow the boom and basket a full range of motion inside the work area. With some types of lifts, once the vehicle is in the desired position, special stabilizing tools (such as outriggers and wheel chocks) need to be installed to safely operate the lift. Other types of lifts allow vehicle movement while the boom is extended and does not require stabilizing equipment. Unless the vehicle is designed to do so an aerial lift vehicle should never be moved when the boom is elevated.

C. Load Limits

- Load limits for the boom and basket shall not be exceeded.
- Load limits for boom and basket must be posted in a visible location on the aerial lift.

- Boom and basket load limits must be specified by the manufacturer or by any other equivalent entity.

D. Wind and Gusty Conditions

Each aerial lift will have manufacturer recommendations (either posted on the lift or in the operation manual) showing the maximum wind/gust speeds for operating the lift. (Excluding a boom truck, most aerial lifts cannot be lifted with wind or gusts exceeding 20 to 25 mph.)

E. Fall Protection

A fall arrest system is required if any risk exists that a worker may fall from an elevated position. As a general rule, the fall arrest system should be used anytime a working height of six feet or greater is reached. Working height is the distance from the walking/working surface to a lower level. Operators in a lift are required to wear a personal fall arrest system consisting of a full-body harness and a lanyard properly attached. An appropriate lanyard, one that is no longer than six (6) feet.

The following information applies to the mandatory fall protection requirements for operators and employees working in an aerial lift (bucket truck, boom lift, or scissor lift).

- Operators shall remain tied off until the work is finished and the lift has been safely lowered to the ground.
- Operators working from an aerial lift may only tie off to the basket or boom of the aerial lift (see manufacturer's recommendations). Trying off to an adjacent pole, structure, or other equipment is prohibited.
- Operators must receive training on the proper use of fall protection equipment
- The fall arrest system shall be rigged such that an operator cannot free fall more than six feet or contact a lower level.
- Operators are prohibited from extending their upper body outside of the basket Personal fall protection equipment or components shall be used only for appropriate fall protection.
- Operators must also ensure that their weight and the weight of any equipment and tools they are using do not exceed the load limit of the aerial lift.
- Personal fall arrest systems or components subjected to impact loading shall be immediately removed from service and shall not be used again.
- Personal fall arrest systems shall be inspected before each use for mildew, wear, damage, or other deterioration. Defective components shall be removed from service.
- Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted

Exemption: Manlifts that have a metal frame completely around the working platform consisting of a 42” inch top bracing bar, the middle bar that traverses up and down to allow individuals to get into the platform, and a 3-4” inch toe board) do not require the use of fall protection. For those who do not meet these criteria, at a minimum, a fall arrest system consisting of a personal body harness and (6) six-foot lanyard will be worn while working with the lift.

Additional personal protective equipment may be required for the work being performed including but not limited to:

- Hard Hats
- Safety Glasses
- Gloves
- Protective clothing

F. Working Surfaces

- Operators shall always stand firmly on the floor of the basket and shall not sit or climb on the edge of the basket.
- Operators shall never attempt to climb outside of the basket or overextend the upper body beyond the railing of the basket.
- Operators may only perform work in areas that can be reached from inside the basket of the lifting device.
- Aerial lifts may not be used in combination with other devices such as ladders, planks, or scaffolding.
- Operators shall not use the lift to climb to a higher elevation

G. Wheel Chocks

Wheel chocks provide additional protection against accidental vehicle movement. Chocks prevent accidental movement or slippage of vehicles by bracing the wheel on both sides. This is important during boom and basket movement when shifting weight can affect wheel placement. Chocks must be utilized before operating an aerial lift that is positioned on an incline.

H. Brakes

Brakes provide protection against accidental movement. Before operating the lift, the operator shall ensure that the brakes are set.

I. Outriggers

Outriggers are a type of stabilizing tool. If outriggers are used they should be positioned on “cribbing” pads or a solid surface.

When setting outriggers the following should be followed:

- When possible, position outriggers on a solid surface such as concrete or asphalt. Position outriggers on level ground.
- Always bring outriggers straight down, never at an angle.
- Never stand behind an outrigger or between an outrigger and another object when it is being retracted. (The center of gravity might have shifted during lifting activities and the sudden release of the outrigger could cause the vehicle to lunge.)
- If the outriggers are positioned on soil, ensure that the surface is stable and not recently backfilled.

J. Power Lines

Only aerial lifts with insulated buckets may be used for work on overhead power lines. Lifts that are not insulated must maintain at least a 15-foot distance between the boom and any energized electrical lines or source. Always treat power lines, wires, and other conductors as being energized even if they are inactive or appear to be insulated.
Operators that are not electrical workers must remain at least 15 feet from power lines.

K. Pedestrian Traffic

Operators must be constantly aware of their surroundings. Aerial lift operators are responsible for the safety of people in the vicinity of the lifting equipment. If aerial lift work needs to be conducted in the vicinity of pedestrian traffic, operators must take special precautions to ensure that the work is isolated from pedestrian traffic.

L. Signs, Tape, and Barriers

An aerial lift boom or basket should never be positioned above pedestrians or other workers. If an aerial lift is going to be used in an area near pedestrian traffic, operators are required to isolate the work area by establishing a perimeter and safely diverting the pedestrian traffic. Signs, caution tape, and barriers should be used to create the perimeter of the work area. Next to buildings, additional signs may be needed at all entrances and around the perimeter of the work area.
Proper barriers (traffic cones, etc.) shall be used when using an aerial lift vehicle, in a vehicle traffic area (street, etc.).

M. Dangerous Obstacles

Operators should never position themselves between overhead hazards; such as joists and beams, or the rails of the basket. Accidental movement of the lift could result in a crushing hazard. Operators should always be aware of other obstacles. Operators must keep a minimum distance of 15 feet from all dangerous obstacles. Dangerous obstacles may include:

- Tools and equipment
- Other aerial lifts
- Other vehicles
- Trenches and pits
- Mechanical devices
- Potholes
- Cranes
- Power lines

N. Tip-Overs

Tip-overs can occur when aerial lifts are operated on soft or uneven ground, if the rated load limit is exceeded, or if the lift is struck by another vehicle. To help avoid a tip-over the following are recommended:

- Do not exceed the manufacturer's rated load capacity limits
- Avoid unnecessary travel with the lift in the elevated position
- Establish a work area perimeter
- Do not drive near leading edges or holes
- Do not raise the platform on a slope or drive onto a slope when elevated
- Do not drive onto uneven or soft surfaces when elevated
- Complete the inspection form
- Do not use the platform in windy conditions
- Avoid excessive horizontal forces when working from an elevated scissor lift

V. Inspections

Prior to operating an aerial lift, the work area shall be inspected to ensure that conditions are safe to operate the aerial lift. Operators must ensure that they are operating in accordance with the Operating Requirements for Aerial Lifts (Section IV) of this guideline.

Operators must document the area inspection before each use. The Aerial Lift Pre-Use Inspection Checklist form (Appendix B) shall be completed and given to the Environmental Health and Safety Department. This form is used for non-motorized vehicles (scissor lift, man-lift, boom lift). These forms shall be retained for a minimum of three years.

A Driver Vehicle Inspection Report (Appendix A) shall be used before operating an aerial lift vehicle (bucket truck, crane, motorized vehicle, etc.). The completed Vehicle Driver Inspection form shall be submitted as stated at the bottom of the form.

All man lifts shall be inspected using the Manlift Inspection Certification Record (Appendix C) by a competent person at least once every quarter. This form should remain with the appropriate man lift until all available inspection slots have been filled out. Once completed, the form shall be turned in to the Environmental Health and Safety Department. These inspection forms shall be retained for a minimum of three years.

Manlifts found to be unsafe shall be removed from service immediately until properly repaired.

VI. Operating Requirements for Scaffolding

Scaffolds shall be furnished and erected for persons engaged in work that cannot be done safely from the ground or solid construction. The following general requirements shall be followed when erecting and using all scaffolding, however, additional specific conditions and guidelines shall be required depending on the type of scaffolding to be erected and utilized.

- The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose bricks, or concrete blocks shall not be used to support scaffolds or planks.
- Scaffolds shall not be loaded in excess of the working load for which they are intended and shall be capable of supporting without failure at least four times the maximum intended load.
- Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.
- All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f (Stress Grade) construction-grade lumber. All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used.
- All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement. Scaffold planks shall extend over their end supports not less than 6 inches and no more than 18 inches.
- Guardrails shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Rails shall be installed no less than 36 inches and no more than 42 inches high, with a mid-rail. Toeboards shall be a minimum of 4 inches in height.
- Scaffolds shall be provided with a screen between the toe board and the guardrail, extending along with the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.

- An access ladder or equivalent safe access shall be provided.
- The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.
- Materials being hoisted onto a scaffold shall have a tagline.
- Employees shall not work on scaffolds during storms or high winds, or when covered with ice or snow, unless all ice or snow is removed and planking sanded to prevent slipping.
- Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.
- When acid solutions are used for cleaning buildings over 50 feet in height, wire rope supported scaffolds shall be used.
- Overhead protection is required for men exposed to overhead hazards. Additional personal protective equipment may be required depending on the specific hazards involved with the work being done.

The following are prohibited in the erection and use of scaffolding:

- The use of shore scaffolds or lean-to scaffolds is prohibited.
- Lumber sizes, when used in this section, refer to nominal sizes except where otherwise stated.
- Scaffolds shall be secured to permanent structures, through the use of anchor bolts, reveal
  bolts, or other equivalent means. Window cleaners' anchor bolts shall not be used.
- Special precautions shall be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.

VII. Training and Recordkeeping

It is the responsibility of each department to ensure that its employees (operators) receive the required training. Training can be provided by the Environmental Health and Safety department.

Training records will be retained by the Environmental Health and Safety office for three years.

Appendix A

UNIVERSITY OF NORTHERN COLORADO
AERIAL LIFT VEHICLE INSPECTION REPORT

UNIVERSITY OF NORTHERN COLORADO

Carrier: UNIVERSITY OF NORTHERN COLORADO			Vehicle Type: ☐ Aerial Lift ☐ Other _____		
Address: 501 20th STREET - CAMPUS BOX 57			City: GREELEY		Zip Code: 80639
☐ PRE-TRIP	Date:	Time: ☐ AM ○ PM	○ POST-TRIP	Date:	Time: ☐ AM ○ PM
Odometer Reading (miles):	Starting Mileage:			Ending Mileage:	

Preview Vehicle - begin with a walk-around using the previous Post-Trip Inspection
Check any defective item using the ☐ for Pre-Trip and the ○ for Post-Trip inspection and provide details under "Remarks."
For Section B and Section C only, *cross out* non-applicable items.

A. Tractor / Truck (Vehicle) License Plate:

Engine

☐ ○ Fluid Leaks	☐ ○ Battery	☐ ○ Radiator	☐ ○ Engine	☐ ○ Starter
☐ ○ All Fluid Levels	☐ ○ Transmission			

Cab

☐ ○ Oil Pressure	☐ ○ Windshield	☐ ○ Windows	☐ ○ Wipers (functionality)	☐ ○ Wipers (blade condition)
☐ ○ Clutch (if equipped)	☐ ○ Dashboard Lights	☐ ○ Horn	☐ ○ Mirrors	☐ ○ All Instrument

Gauges

☐ ○ Fire Extinguisher	☐ ○ Reflective Triangles	☐ ○ Defroster/Heater	☐ ○ Spare Fuses/Bulbs	☐ ○ First Aid Kit (if equipped)

Fuel Level: Circle One; if unsure, round down *(if 1/4 or less, fuel vehicle prior to end of shift!!)*
☐ Pre-Trip Level: F 3/4 1/2 1/4 E ○ Post-Trip Level: F 3/4 1/2 1/4 E

Walk-Around

☐ ○ Steering System	☐ ○ Body (note damage below)	☐ ○ Fuel Tank(s)	☐ ○ Tires (tread / pressure)	☐ ○ Tire Chains (if equipped)
☐ ○ Rear End	☐ ○ Fluid Leaks (non-engine)	☐ ○ Front Axle	☐ ○ Wheels / Rims	☐ ○ Tarpaulin (if equipped)
☐ ○ Suspension System	☐ ○ Drive Line	☐ ○ Muffler(s)	☐ ○ Lug Nuts	☐ ○ Mud Flaps (if equipped)
☐ ○ Exhaust System	☐ ○ Frame / Assembly	☐ ○ Coupling Devices (if equipped)		☐ ○ Roof (note damage below)

Lights & Visibility

☐ ○ Headlamps (Hi / Lo)	☐ ○ Parking Lights	☐ ○ Turn Signals	☐ ○ Backup	☐ ○ Brake
☐ ○ Hazard / Warning	☐ ○ Reflectors (if equipped)	☐ ○ Interior / Dome	☐ ○ Backup Beeper (if equipped)	
☐ ○ Backup Sonar (if equipped)		☐ ○ Other:		

C. Aerial Device (Inspection of Vehicle Components Is Accomplished in the "Tractor / Truck" Section):

☐ ○ Fluid Leaks	☐ ○ Fasteners	☐ ○ All Fluid Levels	☐ ○ Power Take-Off	☐ ○ Liner
☐ ○ Outriggers	☐ ○ Hydraulic System	☐ ○ Retaining Pins	☐ ○ Welds	☐ ○ Bucket
☐ ○ Fiberglass Extension	☐ ○ Safety Belts & Straps	☐ ○ Test Bucket Lift Controls		☐ ○ Test Ground Controls
☐ ○ Warning Lights	☐ ○ Torque Seals	☐ ○ Other:		

Remarks:

☐ PRE-TRIP CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY

Pre-Trip Driver's Printed Name:	Pre-Trip Driver's Signature:

○ POST-TRIP CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY

Post-Trip Driver's Printed Name:	Post-Trip Driver's Signature:

White - Transportation Services Vehicle File Copy *Yellow - Driver / In-Vehicle Copy* UNC EHS Revised 07/2017

Appendix B

University of Northern Colorado
Aerial Lift Pre–Use Inspection Checklist

Operator:	Date:	Aerial or Scissor Lift ID #:
Unit Type: ☐ Scissor Lift ☐ Articulating Boom		Location / Building:
☐ Man Lift ☐ Other_____		Department:

1. Safety Precautions	Status OK NO NA	2. Check Operations	Status OK NO NA
Windy Conditions – less than 20 to 25 MPH (Less than manufacturer guidelines)	☐☐☐	Horn	☐☐☐
Personal Protective Equipment	☐☐☐	Gauge	☐☐☐
Pedestrian / Traffic – Barriers, Tape, Signs	☐☐☐	Brakes	☐☐☐
Wheel Chock and/or Brakes	☐☐☐	Lights	☐☐☐
Working Surface – Level	☐☐☐	Steering	☐☐☐
Power Lines or Electrical Source	☐☐☐	Attachments or Accessories	☐☐☐
Load Limits	☐☐☐	Backup Alarm or Warning Buzzer	☐☐☐
Outriggers	☐☐☐	Warning Lights	☐☐☐
Other _____	☐☐☐	Other _____	☐☐☐

3. Vehicle Inspections	Status OK NO NA	4. Platform Lift Inspection	Status OK NO NA
Oil Level	☐☐☐	Lift and Travel Controls and Switches	☐☐☐
Hydraulic Oil Level	☐☐☐	Placards, Decals, and Control	☐☐☐
Fuel Level	☐☐☐	ID labels	☐☐☐
Check the Lift and Surrounding	☐☐☐	Handrails, Guardrails and Safety Chains	☐☐☐
Area for Leaks	☐☐☐	Platform Deck and Toeboards	☐☐☐
Coolant Level	☐☐☐	Other _____	☐☐☐
Tire Pressure and Condtions of Wheels	☐☐☐		
and Tires	☐☐☐		
Batter and Charger	☐☐☐		
Ground Control Switches	☐☐☐		
Other _____	☐☐☐		

Comments:

IF THE AERIAL LIFT FAILS ANY PART OF THIS INSPECTION, REMOVE THE KEY AND REPORT THE PROBLEM TO YOUR SUPERVISOR. DO NOT ATTEMPT TO MAKE REPAIRS UNLESS YOU ARE A TRAINED AND AUTHORIZED SERVICE PERSON.

Appendix C

University of Northern Colorado
Quarterly Manlift Inspection Certification Record

Manlift Identification number: _____ **Location:** _____

The Manlift inspection shall cover, but is not limited to the following items:

- Steps and step fastenings
- Rails-supports and fastenings
- Rollers and Slides
- Belt and Belt Tension.
- Handholds and Fastenings.
- Floor Landings and guardrails.
- Lubrication.
- Limit Switches, warning signs, lights, and illumination.
- Drive Pulley, bottom (boot) pulley and Clearance, pulley supports.
- Motor. Driving Mechanism, Brake
- Electrical Switches.
- Vibration and Misalignment
- Note if any worn gears are present while in use.
- (There are to always be 12 Pre-Use inspection forms at all times)

Date	Inspector Name	Inspector Signature	Comments *

***If maintenance is needed, Call in the Work Order immediately and reference the WO# in the Comments box.**

Return completed form to the Environmental Health and Safety Department

Appendix D | Locations of Aerial Lifts On UNC Campus | 1/20/2023

Location	Brand Name	Model #	Serial #	Inspecting Dept.
Kepner Hall	Genie Industries	PLC-19	1488-15440-b	HVAC
Ross Hall	Genie Industries	AWP-205-AC	3000-16934	HVAC
Butler-Hancock	Genie Industries	AWP-36	3895-9692	Electrical
Recreation Center	Up Right Inc.	62695	UR-3389	Rec. Center
Recreation Center	SkyJack (Scissor Lift)	SkyJack III	2700-7765	Rec. Center
University Center	Genie Industries	AWP-24	3894-7820	UC
Fraiser	Genie Industries	AWP-305	148-0670	PVA
Fraiser	Up Right Inc.	62611	5016	PVA
Heat Plant	Genie Industries	PLC-30P	1483-5711	Heat Plant
Campus Commons	Genie Industries	GS-2632	GS32P-163708	School of Music
Campus Commons	Genie Industries	GR-20	GRP-157194	School of Music