PREFACE

PURPOSE OF THIS DOCUMENT

The intent of this document is to establish the San Francisco international Airport’s (SFO’s or Airport’s) basic guidelines and minimum expectations regarding the Fall Protection Fall and Fall Hazard Minimization for the designers, engineers, general contractors, construction professionals and other related industries. The information provided in the following sections are basic information, design criteria, guidelines, and details for fall protection systems that are to be installed at SFO. It must be noted that while this document addresses major areas of concern to SFO, it is not an all-inclusive document, and all such designs shall be reviewed and approved by the Airport’s Safety, Health & Wellness Department prior to installation.

HOW TO USE THIS DOCUMENT

These Guidelines are to be used as a resource for the development of project and site specific design documentations including drawings, details and specifications. It is the responsibility of the designers, engineers and construction professionals to adhere to all codes and regulations related to the content presented.

SCOPE

The intent of this document is to establish SFO’s basic guidelines and minimum expectations regarding the Fall Protection Fall and Fall Hazard Minimization for the designers, engineers, general contractors, construction professionals and other related industries. The information provided in the following sections are basic information, design criteria, guidelines, and details for fall protection systems that are to be installed at SFO. It must be noted that while this document addresses major areas of concern to SFO, it is not an all-inclusive document, and all such designs shall be reviewed and approved by the Airport’s Safety, Health and Wellness Office prior to installation.

Any questions or concerns regarding the items or equals specified must be submitted to the Standards Committee in writing. All final decisions regarding products shall be made at the Airport’s discretion. If the Engineer of Record presents items that are not specified or named equals, they must be brought to the Standards Committee for evaluation of those products.

INTRODUCTION

San Francisco International Airport (The Airport) is committed to the continuous improvement of workplace safety and health by providing proactive, creative and expert services. The Airport strives to promote safety in all aspects of the airport operation by teaming up with employees, management and the community to recognize, evaluate, communicate, control, and eliminate or minimize workplace hazards.

PURPOSE

These guidelines serve as a framework when establishing and designing a permanent fall protection system for the facilities at the Airport. These guidelines set the minimum requirements and criteria necessary to ensure a practical and proactive approach in identifying fall hazards, and to provide fall protection system for all employees. The intent of this document is to eliminate, prevent or, at very least, control fall hazards where possible and to protect personnel that are exposed to fall hazards. These guidelines are based on over 25 years of the Airport's experience with fall protection systems as well as design, installation, and replacement of the systems that have failed. Some of Airport standards are more stringent than industry standards due to discovery and failure analysis of systems that have failed or have had poor performance throughout the Airport.
Permanent fall prevention or protection measures must be included as an integral part of the design phase for all new construction projects, as well as remodeling, repair, and almost all roof renovations projects. All walking and working surfaces where employees and other personnel are exposed to fall hazards such as ledges, roof openings, and floor openings shall have permanently installed fall protection system, be permanently guarded and have adequate tieback anchorages, or have fall prevention systems.

<table>
<thead>
<tr>
<th>Version</th>
<th>Publish Date</th>
<th>Revision</th>
<th>Approved By</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>December 2018</td>
<td>Content edit to Page 9, Component Requirements, Section F, #4 (5,000 lbs was previously 5,200 lbs). Missing OPOS reinserted as Appendix C with added OPOS permission letter.</td>
<td>Donna Potts, Jose Yan</td>
</tr>
<tr>
<td>5.0</td>
<td>June 2018</td>
<td>Content Edits Formatting</td>
<td>Donna Potts, Jose Yan</td>
</tr>
<tr>
<td>4.0</td>
<td>December 2017</td>
<td>Formatting</td>
<td>N. King</td>
</tr>
<tr>
<td>3.0</td>
<td>August 9, 2017</td>
<td>-</td>
<td>SFO Safety, Health and Wellness</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>1</td>
</tr>
<tr>
<td>STANDARDS AND REGULATIONS</td>
<td>4</td>
</tr>
<tr>
<td>REQUIRED FALL PROTECTION HIERARCHY</td>
<td>4</td>
</tr>
<tr>
<td>DESIGN REQUIREMENTS</td>
<td>5</td>
</tr>
<tr>
<td>ISSUE RESOLUTION</td>
<td>6</td>
</tr>
<tr>
<td>COMPONENT REQUIREMENTS</td>
<td>6</td>
</tr>
<tr>
<td>SIGNAGE</td>
<td>17</td>
</tr>
<tr>
<td>TRAINING AND OPERATING PROCEDURES</td>
<td>17</td>
</tr>
<tr>
<td>CERTIFICATION</td>
<td>18</td>
</tr>
<tr>
<td>AVAILABLE AIRPORT EQUIPMENT SPECIFICATIONS</td>
<td>20</td>
</tr>
<tr>
<td>EXTERIOR/INTERIOR LIFTS</td>
<td>20</td>
</tr>
<tr>
<td>BOOM LIFT JLG 800AJ</td>
<td>23</td>
</tr>
<tr>
<td>BOOM LIFT JLG E450AJ</td>
<td>25</td>
</tr>
<tr>
<td>BOOM LIFT GENIE Z-30/20N &amp; Z-30/20 N RJ</td>
<td>27</td>
</tr>
<tr>
<td>BOOM LIFT JLG45</td>
<td>29</td>
</tr>
<tr>
<td>BOOM LIFT AB38 SERIES</td>
<td>31</td>
</tr>
<tr>
<td>SCISSOR LIFT GS-1530 &amp; GS-1930</td>
<td>34</td>
</tr>
<tr>
<td>ANCHORS &amp; TIEBACK SYSTEMS</td>
<td>36</td>
</tr>
<tr>
<td>FALL PROTECTION SUPPORT DETAIL</td>
<td>36</td>
</tr>
<tr>
<td>LADDER PLATFORMS</td>
<td>37</td>
</tr>
<tr>
<td>LADDER PLATFORM FOR PARAPETS LESS THAN 12&quot; HIGH</td>
<td>37</td>
</tr>
<tr>
<td>LADDER PLATFORM FOR PARAPETS OVER 12&quot; HIGH</td>
<td>38</td>
</tr>
<tr>
<td>APPENDIX A – TRAVELER</td>
<td>39</td>
</tr>
<tr>
<td>APPENDIX B – NAME PLATE SAMPLES</td>
<td>40</td>
</tr>
<tr>
<td>APPENDIX C – OPOS PERMISSION LETTER AND OPOS DIAGRAM</td>
<td>42</td>
</tr>
</tbody>
</table>
STANDARDS AND REGULATIONS

In most instances, Airport uses the most stringent Standards and Regulations. The following Standards and Regulations list is the minimum recommended guidelines. In addition, all current California Building (CBC), Electrical, Mechanical, Plumbing and Fire Codes must be followed and other Standards and Regulations must be referenced as necessary.

A. Division of Occupational Safety and Health (Cal/OSHA)
   1. GISO, Group 1. Article 2. Standard Specifications, 3212 Floor Openings, Floor Holes and Roofs
   2. GISO, Group 1. Article 2. Standard Specifications, 3209 Standard Guardrails
   3. GISO, Group 1. Article 2. Standard Specifications, 3210 Guardrails at Elevated Locations
   4. GISO, Group 1. Article 4. Access, Work Space, and Work Areas, 3277 Fixed Ladders
   5. GISO, Group 1. Article 5. Window Cleaning
   6. GISO, Group 1. Article 6. Powered Platforms and Equipment and Building Maintenance
   7. CSO, Article 23. Suspended Scaffolds
   8. CSO, Article 24. Fall Protection

B. Federal Occupational Safety and Health Administration (OSHA)
   1. 1910 Subpart D Walking-Working Surfaces
   2. 1910.23 Subpart D Ladders
   3. 1910.29 Subpart D Fall protection systems and fall object protection-criteria and practices.
   4. 1910.66 Subpart F Powered Platforms for building maintenance
   5. 1910.66 Subpart F Powered Platforms for building maintenance, Appendix A, B and D

C. American National Standards Institute (ANSI), American Society of Safety Engineers (ASSE), and International Window Cleaning Association (IWCA)
   1. ANSI/ASSE Z359.1 The Fall Protection Code
   2. ANSI/IWCA I-14.1 Window Cleaning Safety Standard

   It is important to note that compliance with ANSI/IWCA standard does not ensure compliance with the above referenced Cal/OSHA and Federal OSHA standards and vice versa.

D. California Building Code (CBC)
   1. CCR, Title 24, CBC, Section 1015.6 Mechanical equipment, systems and devices

REQUIRED FALL PROTECTION HIERARCHY

The following are the Fall Protection Hierarchy methods, listed in the order of priority for design implementation.

A. Elimination – Remove the risk of falls completely through engineering controls. For example, eliminate a hazard by lowering the work surface to ground level or substitute a process or procedure so that workers no longer have to approach a fall hazard area.

E. Isolation – Isolate or separate the hazard or work practice from workers by using guardrails or by covering the exposed floor openings.
F. Prevention – Secure worker to an anchoring system using a lanyard short enough to prevent the worker’s center of mass from reaching the fall hazard.

G. Fall Arrest – Design a system to stop a worker’s descent before they hit any surface below.

H. Administrative Controls – Work practices or procedures that signal or warn a worker to avoid approaching a fall hazard.

DESIGN REQUIREMENTS

A. All new construction projects and renovations, alterations, or repairs to existing roof systems or roof mounted equipment must comply with the above requirements, as well as any applicable building codes and regulations. In addition, any installations or renovations of equipment that would subject the personnel to fall hazards must incorporate fall protection solutions into the project design phase. Fall protection is required for any sloped roof surfaces steeper than 4:12 or other surfaces steeper than 40 degrees to comply with OSHA regulations. OSHA requires fall protection to be provided at elevations of 4’ in general industry workplaces and 6’ in the construction industry.

B. A qualified person with extensive experience in fall protection design and implementation is required to plan, evaluate, design, and select the most appropriate fall prevention or protection solution, and obtain the approval of SFO’s Safety, Health & Wellness Office. Building anchorages, tie-downs, and any other affected parts of the building shall be designed and certified by a professional mechanical or structural engineer currently registered in the State of California with extensive expertise in fall protection systems.

C. A variety of fall protection solutions are available in the market, however, it is important to select a system based on the specific building type, roof system, and work application. It is of utmost importance that the designers consider the compatibility and continuity of the fall protection systems that are presently installed throughout the Airport. Roof mounted systems, davits, platforms, scaffolding, or any other window washing equipment shall be building specific and shall not be moved to any other location than the one it was designed for.

D. All fall protection systems shall be designed and installed similarly with compatible components to reduce human errors due to variability in fall protection systems.

E. A complete understanding of the work procedures will enable the design team and the fall protection designer to select the most appropriate fall protection system. The schematic design phase shall include consultation with the Airport’s Fall Protection Specialists and affected Facilities Maintenance personnel who will be exposed to fall hazards. The Airport’s Fall Protection Specialists consist of Safety, Health & Wellness Office’s designated Staff, Design and Construction’s designated engineers, and trade specific maintenance personnel. This consultation meeting shall assist the designers in identifying the specific building maintenance and equipment service needs and activities that are required to be conducted throughout the life of the building, and identifying all areas of concerns, and addressing the possible fall and other hazards for Airport personnel. Additionally, this consultation will enable the design team to understand the maintenance procedures and requirements for the structure and the facility, and will allow the design team to discuss maintenance and inspection requirements of the proposed personal fall arrest systems with the actual end users and the Airport’s Fall Protection Specialists.

F. It is essential that during the design phase, the engineers and architects give special attention to the fall hazard exposures and fall prevention for the future building and Facilities Maintenance personnel.
ISSUE RESOLUTION

The Standards Committee administers the A&E Standards by resolving disputes between Stakeholders, calling for periodic updates of the A&E Standards, and granting alternatives and/or exceptions to the application of the A&E Standards.

Whenever a designer, builder, or project owner ("applicant") seeks an alternative/exception to the A&E Standards for a project, the applicant must submit the alternative/exception to the Standards Committee coordinator. To contact the Standards Committee, please reach out to Trudy Homer at 650.821.5387 or Trudy.Homer@flysfo.com. See the Airport Building Regulations (ABR) for details on Committee procedures.

COMPONENT REQUIREMENTS

A. Indoor Mounted Building Components

All indoor equipment shall meet the following requirements:

1. Adequate lighting to maintain the equipment

2. A clear and unobstructed access path from the entrance point to the equipment or areas that require maintenance

3. A clear and unobstructed path around the equipment

4. Adequate ventilation and air circulation for maintenance personnel and the equipment

5. Adequate headroom for maintenance personnel and the equipment

6. When at all possible, locate all equipment away from ledges and heights in excess of 4’ (feet)

7. If the top of equipment exceeds a height of 6’ and needs to be maintained or serviced, fall protection shall be provided.

8. Fall protection shall be provided where cleaning and maintenance of vestibules, interior glass skylights, indoor roofs, and ledges is required.

9. A receptacle must be located every 50’ to allow for proper cleaning and maintenance.

10. Water hose bibs shall be provided on the roof at the entrance to interior windows for proper cleaning and maintenance.

11. All corrugated metal surfaces shall be covered with 16-gauge sheet metal to allow for cleaning and maintenance.

B. Roof Mounted Equipment and Building Components

1. All roof mounted equipment and building components shall meet the following requirements:

   a. Tenant placement of roof equipment shall not interfere with fall protection systems.

   b. Provide clear and unobstructed path from the entrance of the roof to the equipment or areas that require maintenance.
c. Provide clear and unobstructed working area around the equipment. There shall be adequate work room so that maintenance personnel do not enter the 6’ fall hazard area when maintaining the roof mounted equipment or component.

d. Walk pads shall be installed from entrance point leading to all roof mounted equipment.

e. No equipment shall be located on a roof space/structure that is less than 8’ x 8’.

f. When equipment or building components must be installed within 12’ of a roof edge, an engineered fall protection system shall be required (per CBC). This includes roof drains, electrical boxes, light fixtures, photovoltaic (PV) panels, antennas, security cameras, etc. and any building component that may need to be maintained, cleaned, inspected or monitored in any way.

g. If multiple photovoltaic (PV) banks are needed, a minimum of 3’ separation must be provided between each bank.

h. Fall protection system shall take into account all other roof mounted equipment and skylights for the cleaning or maintenance of PV and other roof-mounted equipment.

C. Non-Public Access Guardrail System Installations

1. Guardrails must be provided for fixed ladders at the top of the ladder if ladder is within 6’ of the roof edge or edge is 6’ above a lower structure.

2. Top rail shall be 42”- 45” (inches) above the walking/working surface.

3. Top rail shall withstand a force of 200 pounds (lbs.) when applied in downward or outward direction at any point along the top rail (per CBC).

4. The ends of the top rail shall not extend beyond the last terminal posts, except when such overhang/extensions do not present a hazard.

5. Mid rail shall be located midway between the top rail and the mounting installation level.

6. Mid rail shall withstand a force of 150 lbs. applied in downward or outward direction (per CBC).

7. Both top and mid rails shall be constructed of materials at least ½” thick and 2” wide or 1 ¼” diameter to prevent cuts and lacerations.

8. If wire rope is used for top rail or mid rail, it shall be ½” in diameter and can have no more than 3” (inches) of deflection per each span.

9. Openings in the guardrail system shall be no more than 19” wide.

10. The system shall be smooth to prevent punctures, lacerations or snagging of clothing.

11. Parapets may be used as a guardrail system if the parapet meets the height criteria established for guardrails by OSHA, Cal/OSHA, and CBC.

12. Guardrails or returns shall be provided at the top of the fixed access ladders whenever fixed access ladders are installed.

13. Guardrails shall be installed on the sides of the fixed access ladders at the rooftop whenever the sides of the ladder are within 6’ of the adjacent roof edge.

14. If a walking path or equipment is located within 12’ of a roof edge, a fall protection system shall be provided to protect the employees. Guardrail is one means of such protection.
15. Temporary guardrails are only acceptable during construction and shall not be used as a permanent form of fall protection.

16. Non-penetrating guardrail systems shall not be used as a permanent form of fall protection.

D. Roof Access Hatch

1. When an elevator or stairway cannot be provided for roof access, a roof access hatch with a permanent ladder shall be provided as a means of roof access.

2. Grab bars must extend 42" above the roof level.

3. Provide a ladder safety device at the top of all fixed access ladders (mounted at the center of the rungs) leading to a roof access hatch.

4. Guardrails shall be installed around the roof access hatch when necessary. See Guardrail System Section above for requirements.

5. If a lock is needed at the top of the access hatch, the lock shall be placed so that the employee has two hands free to open the lock.

E. Fixed Ladders

1. Where feasible, ship ladders shall be installed in place of standard vertical ladders.

2. Install fixed access ladders whenever there is equipment installed on the roof of a building to facilitate equipment accessibility.

3. Install fixed access ladders in such way that entry and exit to and from the ladder is away from the edge of the building.

4. Provide a return at the top of all fixed ladders, 36" high and extended 24" toward the roof.

5. All access ladder installations exceeding the height of 14' shall be equipped with an approved engineered fall protection ascending-descending railing system. The railing system shall be continuous, extending for entire length of ladder and for the top bracket to have built-in energy absorber.

6. Landings for all ladders must have adequate space to provide a safe access and fall prevention method.

7. If a fixed ladder is accessible to the public, it must be secured with a double sided security gate or ladder guard and be provided with a locking mechanism.

8. The spacing at the top of a fixed ladder shall be as such that when exiting onto the roof, the last rung is not more than 7" from the roof surface.

9. When a parapet is present, a platform at the top of the ladder shall be provided (see drawing in Part II)

10. All ladders to be installed shall be Class 1 rated ladders.

11. All fixed ladders shall be installed vertically. If a ship ladder is necessary, it must be a minimum of 16 degrees from the vertical surface.

12. All attic/pull-down ladders shall be rated for the same criteria as fixed ladders.

13. All pull down ladders shall be automatic ascending/descending type.

F. Anchors and Tieback Systems
1. Permanent anchors and/or tieback systems shall be installed whenever a tieback is required or when a permanent continuous fall protection system cannot be installed for the maintenance personnel.

2. All anchors and tie off points shall be located outside of the hazard zone.

3. All anchors and tieback systems shall be independent anchoring points, and shall be spaced and secured to the building’s structural support members to provide fall protection for the maintenance personnel.

4. All anchors and tieback systems used for fall protection shall be designed so that each anchor can withstand 5,000 lbs. of pull force. All Engineered Fall Protection Systems shall be designed to support a minimum of 2 people carrying tools.

5. All anchors and tiebacks that are engineered, designed, installed, and used for fall protection or prevention system shall be designed with a minimum Safety Factor of 2.

6. All interior and exterior anchors and tiebacks for all new and existing buildings shall be determined by the specific site criteria.

7. For exterior roof-top applications, fall protection anchoring points are not required for buildings with a continuous perimeter parapet or guardrail of at least 42” minimum height when measured vertically from roof surface level.

8. The anchors and tiebacks shall not be used to support any other structures such as a platforms or guardrails.

9. The anchorage and tieback must prevent the employee from falling more than 6’ to a lower level.

10. Spacing between anchors shall not be more than 33’, and each anchor shall be secured or welded to the structural support member of the building.

11. When podium type tiebacks are to be provided, the top plate dimensions shall be 12” x 12” x 5/8” with 1” diameter holes in each corner (total 4). The holes shall be ½” from the edge of the plate. Top plate shall be type 316 stainless steel. If the stanchion or post cannot be 316 stainless steel, it then can be hot dipped galvanized A 36 steel.

12. Diameter of the post/pipe shall not be less than 4” diameter and 3/8” wall thickness.

13. Overall height of post/pipe stanchion shall not be less than 14” and more than 40”.

14. If temporary fall protection podiums are provided, anchors and tieback systems shall be compatible with the DBI Sala and EZ-Line Retractable Horizontal Lifeline system.

15. The anchoring point must be connected to building structure and independent of the work surface.

16. Every entry anchoring point shall be clearly marked and labeled with load ratings and number of authorized users that can be connected at any time (see Appendix B).

17. All anchoring points shall accommodate the employee’s need for mobility and must not subject user to any danger, trip, or fall hazard.

G. Skylights, Windows, Other Glass Structures and Openings

1. Any employee approaching within 6’ of any skylight shall be protected from falling through the skylight or skylight opening per Cal/OSHA §3212.
2. All skylights are considered roof openings. Skylights shall be guarded by a standard skylight net, fixed standard railing on all exposed sides, or by an engineered fall protection system.

3. Solar tubes are considered skylights and should be treated as roof openings.

4. Rated glass is preferred for all skylights.

5. Access shall not be permitted on glazed surfaces such as roofs, vaults, canopies, or skylights glazed with transparent or translucent materials unless the surface has been deemed/certified to support all anticipated loads. Employees working on such surfaces shall be protected by a fall protection system. The type of lanyard to be used over glass must be a steel cable.

6. When glazed surfaces cannot be safely accessed for maintenance, scaffolds, catwalks, rolling ladders, platforms or other methods of safe access shall be provided.

7. Windows when used for accessing equipment or cleaning windows shall open to the safe side, and shall be provided with a means to be secured or locked from both sides.

8. Skylights shall be designed in such way that employees who will be walking or working around the skylights or on the surfaces of the skylights shall be protected from tripping in, stepping into, or falling through the roof openings by personal fall arrest systems.

9. Maximum height of installed cleanable, vertical surfaces shall be 60’ based on available lifts in use by the Maintenance Department.

H. Engineered Cable Fall Protection Systems and Horizontal Lifeline Systems

All Cable Fall Protection and Horizontal Lifeline Systems shall be engineered systems and designed by a qualified and experienced Mechanical or Structural Engineer licensed in the State of California. The cable fall protection and horizontal lifeline system shall provide the users to walk uninterruptedly the entire length of the system and provide secure means of attachment to offal protection system for the user(s). For all fall protection systems the permanently installed, multi-span Engineered Cable Fall Protection and Horizontal Lifeline System serves as an attachment point for personnel’s lanyards or self-retracting lifelines (SRL), with continuous hands free operation. All Engineered Cable Fall Protection and Horizontal Lifeline Systems shall meet the following requirements:

1. A single-cable pass-through system is required.

2. It is recommended to have the cable systems to be installed overhead. The engineered cable fall protection system shall be tensioned to limit the deflection between two support points to less than 3”.

3. The Engineered Cable Fall Protection System shall be designed for use by a minimum of 2 users.

4. All fall protection installations shall be constructed of Type 316 stainless steel material.

5. The Engineered Cable Fall Protection System shall have ½” diameter Type 316 stainless steel wire rope.

6. The Engineered Cable Fall Protection System shall have pass through intermediate supports located no more than 33’ distance between each support member.

7. The intermediate supports shall be compatible with the existing trolleys/travelers currently used by the Airport maintenance personnel (see Appendix A).

8. All brackets and supports shall be constructed from Type 316 stainless steel, minimum ½” thick material.

9. All hardware & fasteners shall be constructed from Type 316 stainless steel material.
10. All fastening and anchoring devices for all starting and end support brackets shall be minimum of four 5/8” diameter type 316 stainless steel SAE Grade 3 threaded fasteners. Only intermediate support brackets can have 5/8” threaded fasteners.

11. Starting and ending connection points for engineered cable fall protection systems must not subject the user to any danger or fall hazards, i.e. hatch access must provide safe access to cable fall protection system.

12. Adequate corrosion protection coating, i.e. hot dip galvanization or cold galvanizing coating shall be applied on all structural members’ exposed surfaces. Cold galvanizing shall only be used for touch ups in the field.

13. All anchoring methods in concrete shall be a minimum of 5” epoxy embedment method, utilizing approved anchoring epoxy.

14. All nuts used for fall protection system shall be of non-loosening locking type.

15. No aluminum shall be used in connection of any fall protection system.

16. All designed systems shall be consistent and made from galvanically compatible metals.

17. All systems must be labeled at the entry point to any cable fall protection system with the maximum number of users the system was designed to support (see sample signage in Appendix B).

18. All single point fall protection installations shall be attached to the structure of the buildings using minimum of two 5/8” type 316 stainless steel bolts or shall be welded.

19. If the cable must pass through a glass panel, the glass must be protected to prevent glass breakage.

20. If a catwalk grating is used for the purpose of users to stand on in order to accomplish a task at heights, the grating must be secured to the structure to provide a stable base for the user to stand on.

21. System shall not pass within close proximity to any structures or equipment in order to prevent contact between the trolley and the structure.

22. Cable systems above tenant areas shall have an approved flat walking surface. Corrugated metal surfaces are not acceptable.

23. The load ratings and number of authorized users that may attach to the Engineered Cable Fall Protection System at one time shall be posted at the beginning/entry point to each system.

24. All users of the Engineered Cable Fall Protection Systems shall be trained in properly using, inspecting, and maintaining such systems.

25. The minimum required components for each Engineered Cable Fall Protection System is as follow:
   a. Open body turnbuckles at each end of the cable to provide for the tension adjustment.
   b. Cable attachments to tensioning devices (turn buckle) shall be through the use of swage studs. The cable assembly shall be swaged using a 75-95 ton die-press. Swage-less connections are not allowed.
   c. Cables shall be tensioned to 500-700 lbs.
   d. A minimum of one shock absorber at one end of the cable system.
   e. The shock absorbers shall be constructed of type 316 stainless steel.
   f. All adjustments shall be secured to prevent tampering.
g. The system shall have tamper proof indicators to display any kind of tampering.

I. Photovoltaic Panels (PV)
   1. Three-foot (3 ft.) walking pads shall be provided every 15 ft. between PV panels. (Maximum cleaning pole reach is 15 ft.).

   ![Diagram of PV Panels and Walking Pads]

   (For illustrative purposes only)

   2. A water hose bib shall be provided at every 75’ or less for cleaning PV panels and other building components such as skylights, clear stories, and windows.

   3. All sharp edges which would catch clothes, hoses, lanyards, or cause injuries to personnel shall be eliminated.

J. Rolling Platforms
   1. All rolling platforms shall be power assisted.
   2. All components must be corrosion resistant.
   3. Bearings must be lifetime lubricated.
   4. System must be grounded.
   5. Walking surfaces must be slip resistant.
   6. Access points must be convenient and not subject the user to any danger, trip, or fall hazard.

K. Suspended Platforms/Swing Stage
   1. Track Mounted Powered Rolling Davit Systems shall be provided with Intermittent Stabilization Anchors to provide track stability and safety.
      a. Swing stage platforms shall have a permanently installed wind anemometer.
   2. All supports and drops for swing stage or Boson’s Chair shall be designed for a working load of 1000 lbs. with minimum safety factor of 4 to prevent fracture or detachment.
   3. All Track Mounted Rolling Davit System shall be designed with Working Load of 1,150 lbs. and Normal Wind Speed Operation of 25 miles per hour (mph). and fully operational at speeds up to 50 mph. The system shall withstand 100 mph in secured stored positions.
4. The installation shall be designed to provide continuous contact between the service platform and the structure.

5. Suspension rope angulation of two 2” to 4” shall be designed into the suspension system so that the platform shall exert a minimum pressure of approximately 10 lbs. against the face of the building.

6. Structural Calculations shall be provided, complete with tabulated load information.

7. Mill Test and certification test reports shall be provided to the Airport for all wire suspension rope and on all metals, aluminum or steel, used in the manufacture of the permanently installed components of the swing stages.

8. Test and certification reports shall be provided to Airport indicating compliance with specified performance characteristics and physical properties.

9. Operation and Maintenance Manual, for all specified systems shall be provided to the Airport, and shall include the following:
   b. Reduced plastic laminated record drawings showing equipment locations and details to be posted near exits onto roof.
   c. Lubrication charts indicating equipment lubrications points, frequency of lubrication required, and type of lubricant for equipment.
   d. Detailed Rescue Plan, including step-by-step instructions and illustrations for rescue during emergency operations.

10. All electrical boxes and housing, including reel housing, shall be made of corrosion resistant material.

11. Adequate on site storage is required for all swing stages, moving platforms, or other building specific fall protection equipment. This storage shall be located in close proximity to where the work will be occurring and will not put undue burden on those who need to use it. Roof mounted equipment shall be stored on the roof in a protected structure.

L. Track Systems, Supports, Powered Davits, and Service Platforms

1. Track systems, supports, powered davits, and service platforms shall be fabricated from structural steel shapes, hot dipped galvanized, or primed and painted with high-performance epoxy coatings.

2. All curved tracks shall be smooth continuous radii and not segmented.

3. Provide track end stops at all track ends to prevent the davit carriages from moving beyond the tracks.

4. Wheel assemblies shall be able to be removed and repaired during routine maintenance.

5. The track system shall be located for controlled positioning of the suspended service platform to allow safe suspension, at any designated position.

6. The track system shall include workstation alignment components, as necessary, to assure programmable positioning of the carriage.

7. Track joints shall be level within 1/16” maximum in 10’ in any direction.

8. Track joints gap shall not exceed 1/8”.

9. Track system to maintain constant elevation of +/- 1/4” every 120” when changing elevation.
10. Provide clearance above and below bottom track flange for wheel and lug clearances.

11. Track Supports shall be sized to support the spans of up to 10’.

12. Tracks shall have provisions for Thermal Expansion and Movements without any adverse effect on horizontal movement of equipment.

M. Powered Rolling Davit Carriages

1. All Powered Rolling Davit Carriages shall permit smooth, quiet running while supporting the work load.

2. Equipment load bearing wheels and guiding wheels shall fit the track profile and shall have lifetime lubricated sealed bearings.

3. Each carriage shall have a two piece, tilt-up rotating davit arm.

4. The system shall be designed with all safety interlocks as such to safely maintain the suspended powered working platform in working positions over the side of the building.

5. The horizontal movement of the powered rolling davit carriages shall be controlled to ensure safe movement and accurate positioning and shall not exceed a traversing speed of 50’ per minute. Horizontal travel may be by friction wheel drives.

6. Powered Rolling Davit Carriages Standard Requirements:
   a. The system’s stability shall be provided by attachment to structural supports and track systems.
   b. The stability factor for horizontal travel shall not be less than 4 including the effects of impact when a 10 pounds per square foot (psf) wind load is applied to the equipment.
   c. The equipment shall be capable of withstanding the highest wind velocities expected for the specific area.
   d. When the equipment is in a non-use or stored position it shall withstand wind velocity of 100 mph.
   e. An automatically applied braking system shall be provided that will prevent unintentional traverse of the powered rolling davit carriages.
   f. A key lock-out for the power supply shall be provided to prevent their unauthorized use.
   g. Enclosures and/or guards shall be installed to prevent accidental contact by personnel with moving parts or pinch points.
   h. Interlocks shall be provided on the carriage and power cord reel to prevent any undue strain on the power cord and to prevent it from being trapped between the carriage wheels and the roof tracks.
   i. Traversing controls shall be of a continuous pressure weatherproof type. Multi controls when provided shall be arranged to permit operation from only one control station at a time.
   j. Each work station shall be identified by indexing vanes (clamped to track rails).
   k. Power Requirements shall be 208 volts, 3 phase, 60 Hertz (Hz), 30 amperes (amps).
   l. The rolling davit carriages must be powered by a dedicated electrical circuit from power outlets.
   m. The electric cord is to be on an electric power reel, mounted on the unit that can automatically payout and collect the cord during movement.
   n. The reel shall have interlocks to stop travel before the cord reaches its end.
o. The operating controls shall be so connected and interlocked so that traversing of the powered rolling davit carriages is not hampered.

p. The suspended platform shall be located at its uppermost outboard position for traversing and is free from contact with the face of the building, and at its innermost position on the davit arm.

q. Controls shall be accessible from the suspended platform.

r. All protective devices and interlocks shall be located to allow traversing of the davit carriage without interference with the devices.

s. Provide all necessary and required electrical controls, interlocks and attachments for a safe and efficient operation.

N. Powered Service Platform:

1. All self-powered platforms shall be capable of supporting 2 workers & their tools.

2. Equipment shall be designed for safe working load of 500 lbs. for 2 people and their tools, exclusive of the weight of the stage and the cables.

3. Facade Rollers shall be 2 ½” minimum diameter, non-marking rollers, located on the inboard side of the platform.

4. Electric Hoist shall be traction type electric hoist with dual 5/16” wire suspension ropes and associated powered wire winder to prevent the suspension rope tail lines from hanging below platform. The suspension wire ropes shall be long enough to reach the full height of the building at all intended working stations, and at least four full wraps remaining on the wire winder.

5. Provide a secondary wire rope that goes through an overspeed rope grab device with a governor that automatically activates when platform experiences an over speed condition.

6. Operating Speed of Platform shall be approximately 35’ per minute in either ascending or descending mode.

7. Two (2) Emergency Stop Switches shall be provided at each operator’s station to stop the platform travel.

8. Individual Controls shall be provided for each hoist for raising, lowering and leveling of the platform.

9. Overload and Slack Wire Devices shall be provided at each hoist.

10. Upper Travel Limit Switch shall be located at the top fairlead of each hoist with an interlock system to prevent upward movement beyond the safe limits.

11. Platform Deck shall be perforated aluminum to allow the passage of air and to prevent wind related uplift force. The size openings shall not be ½” x ½” to prevent tools or component pieces from falling through.

12. Provide a brass label attached to the platform, indicating the maximum load capacity of the platform/system, 500 lb. Minimum Live load for 2 workers and their tools.

13. Provide corrosion resistant water tanks for carrying fresh water and drain valves at the bottom.

14. Provide an ABC rated fire extinguisher mounted inside the platform.

15. Provide lower obstruction detectors to stop downward travel when contacting an obstruction from below.
16. Provide a level sensing system that will prevent the platform from being out-of-level by more than 5 degrees. Control system shall be as such that either hoist operator can correct an out-of-level condition.

17. All hardware including connectors, bolts, self-locking nuts, washers, etc. shall be type 316 stainless steel.

18. Provide a factory installed minimum 3/8" diameter horizontal galvanized wire rope safety line at the rear mid rail level of the stage platform for the attachment of worker's fall protection equipment lanyards. Safety line shall be secured to a structural member of the platform's deck at both ends. Connections shall be capable of sustaining a minimum of 5000-lb. load before failure. Rope clips are not allowed.

19. Provide a mechanism to lower the platform manually, at a controlled rate, in case of an emergency.

20. Power Requirements shall be 208 volts, 3 phase, 60 Hz, 30 amps [National Electrical Manufacturers Association (NEMA) rating L15-30].

21. The electrical power shall be from a dedicated electrical circuit from power outlets. Electrical cords shall be stored in a bin, mounted on the outside of the platform.

22. Provide each outlet with a strain relief anchor.

23. All electrical power and controls shall be made weatherproof through use of twist-lock receptacles and similar devices to suit platform requirement.

24. All electrical power outlets shall be rated for 208 volts, 3 phase, 60 Hz, 30 amps.

25. Each outlet on each level of the building shall be on separate circuit.

26. Provide a separate grounding conductor for the equipment ground grounding.

27. Electrical outlets shall be powered only while the platform is in use and shall not be available at any other time. A conveniently located electrical switch that can be locked in “OFF” position shall be installed to turn off power to the equipment's electrical outlet.

28. A Portable Wind Anemometer shall be provided for monitoring wind velocity during platform use. Reading shall be in miles per hour and operating power shall be from internal turbine or 9-volt battery.

O. Intermittent Stabilization Anchors Design:

1. The intermittent stabilization anchors shall be specially designed to mount to the exterior building structure at horizontal intervals that are equal to the space between the platform's suspension wire ropes at all required service drop positions. Vertical spacing of the intermittent stabilization anchors shall be 50' on center maximum or every 3 floors, whichever is less.

2. Provide shop drawings indicating location, intended loads and structural requirements of the intermittent stabilization system.

3. Stabilization anchors shall be installed on buildings with suspension heights exceeding 75', with the first anchor being no more than 40' from the top of the building.

4. Stabilization Anchors must withstand 1000 lbs. ultimate pull in any direction.

5. Intermittent stabilization lanyards shall:

6. Have tie-in lanyards at each of the platform's suspension ropes.

7. Be complete with stainless steel "Quick Connect" devices for attachment to the building anchors.

8. Be high quality 316 stainless steel cable, or equal, capable of adjustment for length.
9. Be one-piece and stored around the platform fairleads.

P. Load-Rating Identification:
   1. Each system shall be provided with a name plate (see Appendix B) to indicate the load rating of the installed system.
   2. The system includes Trolleys, Roof Tieback Anchors, and maximum number of persons on each system.
   3. The load-rating Identification plate shall be of non-corrosive, permanent-type, compatible material and securely fastened to the unit.
   4. All letters and figures on the plate shall be made by stamping, or etching, or shall be cast on the surface of the plate. The letters and figures shall be 1/4” with the load indicated in ½” size. The letters and figures shall be maintained in a legible condition.

SIGNAGE

A. Demarcation lines
   1. Required when any type of fall protection equipment is required, used to highlight all hazards.
   2. Line shall be yellow or red, 4” wide, at left from/around hazard.

B. Signage (See Appendix B)
   1. Where fall protection is required, reflective signage is required at access points.
   2. Every anchoring point and location shall be clearly marked and labeled with load ratings and number of authorized users that can be connected at any time.
   3. All systems must be labeled at the entry point to any cable fall protection system with the maximum number of users the system was designed to support.
   4. Must be fabricated of minimum 18-gauge stainless or brass with stamped letters and mechanically secured to structure.

TRAINING AND OPERATING PROCEDURES

A. Training
   1. Factory-authorized service representative shall demonstrate systems and train Owner’s maintenance, SFO Safety, Health and Wellness, and Design & Construction Mechanical Engineering personnel to adjust, operate, and maintain fall protection and window cleaning equipment as part of the facility activation phase, prior to building occupancy of a new construction, remodel, or repair project.

B. Operating Procedures Outline Sheet (OPOS)
   1. An OPOS is an official document which establishes safe window cleaning and exterior maintenance procedures for buildings and structures. An OPOS shall include all of the necessary elements in pictorial and written form, to instruct employees in the safe use of roof supported building maintenance equipment or window cleaning procedures.
   2. The OPOS must be written by a person possessing a current California Scaffold Inspection Testing (SIT) certification. The OPOS must be specific to Airport buildings being constructed or
remodeled with accurate contact numbers and terminology. It must be legible and easily read and understood by the employees performing window cleaning or exterior building maintenance.

3. A draft OPOS for any new installation shall be submitted to the Airport Safety Health and Wellness office for review and approval (see example of an OPOS in Appendix C).

   a. An OPOS shall include the following:
      1) A graphical representation of the building’s roof, including the building’s name, address and the date the OPOS was prepared.
      2) A clear graphical representation of the building’s interior window cleaning procedures.
      3) Identification of drop zones, recommended drop sequences, scaffold configurations, and specific building maintenance procedures, if applicable, including the equipment to be used, e.g. permanent roof rigging platform, ground rigged scaffolding, davits, outrigger beams, boatswain’s chair or seatboard, etc.
      4) Identification of all anchorage points for personal fall arrest systems and building maintenance equipment.
      5) Identification of personal fall protection requirements and, if applicable, procedures for securing equipment.
      6) Identification of all hazardous areas on the roof by highlighting all "Hazard Zone(s)" on the drawing(s).
      7) Where applicable, description of the means and methods to be used to transfer equipment from drop location to drop location or between building levels.
      8) Identification of equipment limitations, load ratings, and any special use conditions.
      9) Provisions for pre-operational procedures, and maintenance inspections.
     10) Identification of all access and egress points to the work locations and the storage area(s) for the permanent or transportable building maintenance equipment.
      11) Where applicable, indication of the location and method of stabilization provided for suspended equipment.
      12) Emergency and rescue procedures, and means of communications to be used during such procedures.
      13) Method(s) to be used to control employee exposure to fall hazards while being in the "Hazard Zone."

CERTIFICATION

A. Initial certification of fall protection equipment of a new construction, remodel, or repair project shall include field quality control testing:
   1. Load Tests: Completed systems shall be tested.
   2. Building Access via Platform: Completed window washing systems shall be demonstrated to be operable by the installer to confirm that building perimeter is accessible.
   3. Two (2) future annual inspections and testing after initial certification shall be provided by the new construction, remodel, or repair project.
4. Inspection and testing shall be completed and documented by a Scaffold Inspection and Testing Company or a Professional Engineer experienced in the design of building safety devices and equipment.

5. Testing and operation shall be performed in the presence of a representative of SFO’s Safety, Health & Wellness Office.

B. Decommissioning and recertification of fall protection equipment:

1. Written consent must be obtained through SFO’s Safety, Health and Wellness Office before temporarily decommissioning a fall protection system.

2. If an existing fall protection system or a portion of a fall protection system needs to be temporarily decommissioned during the renovation or remodel of a building, facility or work area, the decommissioned fall protection system needs to be reinstalled to original design documents or a new system needs to be installed.

3. Access to an existing fall protection system must be maintained during and after any construction activities. Safe access to any reinstalled or new fall protection system must adhere to the requirements in these Standards, Criteria and Specifications. Access to a fall protection system cannot be through stepping off of any type of lift.

4. Reinstallations must be inspected and tested before being placed back into service to determine that all parts of the installation conform to the original design documents. This inspection and testing must be completed and documented by a Scaffold Inspection and Testing Company or a Professional Engineer experienced in the design of building safety devices and equipment. A new system installation must adhere to the requirement in these Standards, Criteria and Specifications.

5. All reinstallations must be witnessed by SFO’s Safety, Health and Wellness Office.
## AVAILABLE AIRPORT EQUIPMENT SPECIFICATIONS

### EXTERIOR/INTERIOR Lifts

List of Available Lifts

<table>
<thead>
<tr>
<th>#</th>
<th>Vehicle ID</th>
<th>Type</th>
<th>Make</th>
<th>Model</th>
<th>Year</th>
<th>GVVW</th>
<th>VIN</th>
<th>Dept ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>525E1</td>
<td>UPRIGHT</td>
<td>AB38</td>
<td></td>
<td>2000</td>
<td>9140</td>
<td>1987-2000</td>
<td>AUTO</td>
</tr>
<tr>
<td>2</td>
<td>525E2</td>
<td>UPRIGHT</td>
<td>AB38</td>
<td></td>
<td>2000</td>
<td>9140</td>
<td>1986-2000</td>
<td>AUTO</td>
</tr>
<tr>
<td>3</td>
<td>525E3</td>
<td>UPRIGHT</td>
<td>AB38</td>
<td></td>
<td>2000</td>
<td>9140</td>
<td>1968-1999</td>
<td>AUTO</td>
</tr>
<tr>
<td>4</td>
<td>525E4</td>
<td>UPRIGHT</td>
<td>AB38</td>
<td></td>
<td>2000</td>
<td>9140</td>
<td>1937-1999</td>
<td>AUTO</td>
</tr>
<tr>
<td>5</td>
<td>525E5</td>
<td>UPRIGHT</td>
<td>26N</td>
<td></td>
<td>2000</td>
<td>5747</td>
<td>15304</td>
<td>AUTO</td>
</tr>
<tr>
<td>6</td>
<td>525E6</td>
<td>DENKA</td>
<td>DKN3MK28</td>
<td></td>
<td>2000</td>
<td>5625</td>
<td>UJ1DN3M28WDK14072</td>
<td>AUTO</td>
</tr>
<tr>
<td>7</td>
<td>525E7</td>
<td>GENIE</td>
<td>TMZ-50/30</td>
<td></td>
<td>2000</td>
<td>4900</td>
<td>1G9AA2313YR242179</td>
<td>AUTO</td>
</tr>
<tr>
<td>8</td>
<td>525E8</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>30175</td>
<td>AUTO</td>
</tr>
<tr>
<td>9</td>
<td>525E9</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>30173</td>
<td>AUTO</td>
</tr>
<tr>
<td>10</td>
<td>525E10</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30234</td>
<td>AUTO</td>
</tr>
<tr>
<td>11</td>
<td>525E11</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30238</td>
<td>AUTO</td>
</tr>
<tr>
<td>12</td>
<td>525E12</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30300</td>
<td>AUTO</td>
</tr>
<tr>
<td>13</td>
<td>525E13</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30302</td>
<td>AUTO</td>
</tr>
<tr>
<td>14</td>
<td>525E14</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30305</td>
<td>AUTO</td>
</tr>
<tr>
<td>15</td>
<td>525E15</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30302</td>
<td>AUTO</td>
</tr>
<tr>
<td>16</td>
<td>525E16</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30388</td>
<td>AUTO</td>
</tr>
<tr>
<td>17</td>
<td>525E17</td>
<td>GENIE</td>
<td>GS1530</td>
<td></td>
<td>2000</td>
<td>2563</td>
<td>GS30383</td>
<td>AUTO</td>
</tr>
<tr>
<td>18</td>
<td>525E18</td>
<td>GENIE</td>
<td>GS-2032</td>
<td></td>
<td>2000</td>
<td>3503</td>
<td>31558</td>
<td>AUTO</td>
</tr>
<tr>
<td>19</td>
<td>525E19</td>
<td>JLG</td>
<td>20VP LIFT</td>
<td></td>
<td>2001</td>
<td>1910</td>
<td>0130003822</td>
<td>CUST</td>
</tr>
<tr>
<td>20</td>
<td>525E20</td>
<td>JLG</td>
<td>20VP LIFT</td>
<td></td>
<td>2001</td>
<td>1910</td>
<td>0130003826</td>
<td>CUST</td>
</tr>
<tr>
<td>21</td>
<td>525E21</td>
<td>JLG</td>
<td>20VP LIFT</td>
<td></td>
<td>2001</td>
<td>1910</td>
<td>0130003821</td>
<td>CUST</td>
</tr>
<tr>
<td>22</td>
<td>525E22</td>
<td>GENIE</td>
<td>S-6S</td>
<td></td>
<td>2001</td>
<td>28982</td>
<td>560-7648</td>
<td>AUTO</td>
</tr>
<tr>
<td>23</td>
<td>525E23</td>
<td>MARKLIFT</td>
<td>J-14EP</td>
<td></td>
<td>1994</td>
<td>1865</td>
<td>23547</td>
<td>AUTO</td>
</tr>
<tr>
<td>24</td>
<td>525E24</td>
<td>MARKLIFT</td>
<td>J-14EP</td>
<td></td>
<td>1994</td>
<td>0</td>
<td>987-14881</td>
<td>AUTO</td>
</tr>
<tr>
<td>25</td>
<td>525E26</td>
<td>GENIE</td>
<td>GS-1930</td>
<td></td>
<td>1999</td>
<td>3380</td>
<td>10488</td>
<td>AUTO</td>
</tr>
<tr>
<td>26</td>
<td>648</td>
<td>ECONOMY</td>
<td>LIFT</td>
<td></td>
<td>1979</td>
<td>0</td>
<td>41827</td>
<td>ELECT</td>
</tr>
<tr>
<td>27</td>
<td>663</td>
<td>GENIE</td>
<td>Z30/20</td>
<td></td>
<td>1986</td>
<td>8500</td>
<td>3086-663</td>
<td>ELECT</td>
</tr>
<tr>
<td>28</td>
<td>688E</td>
<td>SKYJACK</td>
<td>SJIII LIFT</td>
<td></td>
<td>1999</td>
<td>5040</td>
<td>70356</td>
<td>ELECT</td>
</tr>
<tr>
<td>29</td>
<td>857</td>
<td>MARKLIFT</td>
<td>RT40E LIFT</td>
<td></td>
<td>1985</td>
<td>8390</td>
<td>88511729</td>
<td>LABOR</td>
</tr>
<tr>
<td>30</td>
<td>858</td>
<td>MARKLIFT</td>
<td>MAC25T LIFT</td>
<td></td>
<td>1985</td>
<td>4400</td>
<td>78511519</td>
<td>LABOR</td>
</tr>
<tr>
<td>31</td>
<td>996</td>
<td>GENIE</td>
<td>PLC24PDC</td>
<td></td>
<td>1983</td>
<td>0</td>
<td>1482-3767</td>
<td>CUST</td>
</tr>
<tr>
<td>32</td>
<td>1000</td>
<td>GENIE</td>
<td>PL24PDC</td>
<td></td>
<td>1984</td>
<td>0</td>
<td></td>
<td>CUST</td>
</tr>
<tr>
<td>#</td>
<td>Vehicle ID</td>
<td>Type</td>
<td>Make</td>
<td>Model</td>
<td>Year</td>
<td>GVW</td>
<td>VIN</td>
<td>Dept ID</td>
</tr>
<tr>
<td>----</td>
<td>------------</td>
<td>--------</td>
<td>------</td>
<td>------------</td>
<td>------</td>
<td>-----</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>33</td>
<td>1008E</td>
<td>9330</td>
<td>GENIE</td>
<td>LIFT</td>
<td>1986</td>
<td>0</td>
<td></td>
<td>CUST</td>
</tr>
<tr>
<td>34</td>
<td>1009</td>
<td>9330</td>
<td>GENIE</td>
<td>LIFT</td>
<td>1986</td>
<td>0</td>
<td></td>
<td>CUST</td>
</tr>
<tr>
<td>35</td>
<td>1014</td>
<td>9330</td>
<td>GENIE</td>
<td>AWP24</td>
<td>0</td>
<td>0</td>
<td>S/N#3893-5153</td>
<td>CUST</td>
</tr>
<tr>
<td>36</td>
<td>525E27</td>
<td>9330</td>
<td>GENIE</td>
<td>S-12S</td>
<td>2004</td>
<td>44640</td>
<td>S12504-907</td>
<td>AUTO</td>
</tr>
<tr>
<td>37</td>
<td>525E28</td>
<td>9330</td>
<td>JLG</td>
<td>3246ES</td>
<td>2006</td>
<td>4950</td>
<td>0200159694</td>
<td>AUTO</td>
</tr>
<tr>
<td>38</td>
<td>525E29</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2006</td>
<td>2080</td>
<td>0200156154</td>
<td>AUTO</td>
</tr>
<tr>
<td>39</td>
<td>525E30</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2006</td>
<td>2080</td>
<td>0200156216</td>
<td>AUTO</td>
</tr>
<tr>
<td>40</td>
<td>525E31</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2006</td>
<td>2080</td>
<td>0200156213</td>
<td>AUTO</td>
</tr>
<tr>
<td>41</td>
<td>525E32</td>
<td>9330</td>
<td>GENIE</td>
<td>IWP-25S</td>
<td>1998</td>
<td>1390</td>
<td>4098-2020</td>
<td>AUTO</td>
</tr>
<tr>
<td>42</td>
<td>525E33</td>
<td>9330</td>
<td>GENIE</td>
<td>IWP-25S</td>
<td>1998</td>
<td>1390</td>
<td>4098-2021</td>
<td>AUTO</td>
</tr>
<tr>
<td>43</td>
<td>525E34</td>
<td>9330</td>
<td>GENIE</td>
<td>IWP-25S</td>
<td>1998</td>
<td>1390</td>
<td>4098-2022</td>
<td>AUTO</td>
</tr>
<tr>
<td>44</td>
<td>525E35</td>
<td>9330</td>
<td>JLG</td>
<td>E45OAJ</td>
<td>2006</td>
<td>14300</td>
<td>0300102278</td>
<td>AUTO</td>
</tr>
<tr>
<td>45</td>
<td>525E36</td>
<td>9330</td>
<td>GENIE</td>
<td>Z-60/34</td>
<td>2007</td>
<td>25178</td>
<td>Z6007-7786</td>
<td>AUTO</td>
</tr>
<tr>
<td>46</td>
<td>525E37</td>
<td>9330</td>
<td>SKYJACK</td>
<td>SJ3219 LIFT</td>
<td>2007</td>
<td>2580</td>
<td>268111</td>
<td>AUTO</td>
</tr>
<tr>
<td>47</td>
<td>525E38</td>
<td>9330</td>
<td>SKYJACK</td>
<td>SJIII LIFT</td>
<td>2007</td>
<td>2580</td>
<td>268110</td>
<td>AUTO</td>
</tr>
<tr>
<td>48</td>
<td>72500008</td>
<td>9330</td>
<td>JLG</td>
<td>4394RT</td>
<td>2009</td>
<td>14820</td>
<td>0200192878</td>
<td>AUTO</td>
</tr>
<tr>
<td>49</td>
<td>72500007</td>
<td>9330</td>
<td>GENIE</td>
<td>GS-3232</td>
<td>2009</td>
<td>5185</td>
<td>GS3209-94373</td>
<td>AUTO</td>
</tr>
<tr>
<td>50</td>
<td>72500005</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2009</td>
<td>2750</td>
<td>0200192683</td>
<td>AUTO</td>
</tr>
<tr>
<td>51</td>
<td>72500002</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2009</td>
<td>2750</td>
<td>0200192683</td>
<td>AUTO</td>
</tr>
<tr>
<td>52</td>
<td>72500004</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2009</td>
<td>2750</td>
<td>0200192685</td>
<td>AUTO</td>
</tr>
<tr>
<td>53</td>
<td>72500003</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2009</td>
<td>2750</td>
<td>0200192687</td>
<td>AUTO</td>
</tr>
<tr>
<td>54</td>
<td>72500006</td>
<td>9330</td>
<td>JLG</td>
<td>E45OAJ</td>
<td>2009</td>
<td>14520</td>
<td>0300136950</td>
<td>AUTO</td>
</tr>
<tr>
<td>55</td>
<td>72500162</td>
<td>9310</td>
<td>GENIE</td>
<td>FORKLIFT</td>
<td>2008</td>
<td>9810</td>
<td>19880</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>56</td>
<td>72500176</td>
<td>9330</td>
<td>REACHMASTER</td>
<td>FS105</td>
<td>2009</td>
<td>9130</td>
<td>09021</td>
<td>AUTO</td>
</tr>
<tr>
<td>57</td>
<td>72500371</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2011</td>
<td>2080</td>
<td>B200001525</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>58</td>
<td>72500372</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2011</td>
<td>2080</td>
<td>B200001530</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>59</td>
<td>72500373</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2011</td>
<td>2080</td>
<td>B200001529</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>60</td>
<td>72500374</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2011</td>
<td>2080</td>
<td>B200001526</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>61</td>
<td>72500375</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2011</td>
<td>2080</td>
<td>B200001523</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>62</td>
<td>72500384</td>
<td>9330</td>
<td>SNORKEL</td>
<td>A38E</td>
<td>2011</td>
<td>8822</td>
<td>A38E-04-4574</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>63</td>
<td>72500385</td>
<td>9330</td>
<td>SNORKEL</td>
<td>A38E</td>
<td>2011</td>
<td>8822</td>
<td>A38E-04-4573</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>64</td>
<td>72500392</td>
<td>9330</td>
<td>JLG</td>
<td>800AJ</td>
<td>2011</td>
<td>34300</td>
<td>300150548</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>65</td>
<td>72500568</td>
<td>9330</td>
<td>JLG</td>
<td>E300AJP</td>
<td>2013</td>
<td>15300</td>
<td>0300168185</td>
<td>MECH</td>
</tr>
<tr>
<td>66</td>
<td>72500605</td>
<td>9330</td>
<td>JLG</td>
<td>X550AJ</td>
<td>2013</td>
<td>4718</td>
<td>C170000332</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>67</td>
<td>72500765</td>
<td>9330</td>
<td>SKYJACK</td>
<td>SJIII LIFT</td>
<td>2014</td>
<td>2400</td>
<td>10001135</td>
<td>GARD</td>
</tr>
<tr>
<td>68</td>
<td>72500783</td>
<td>9330</td>
<td>JLG</td>
<td>2632ES</td>
<td>2015</td>
<td>4675</td>
<td>0200241101</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>69</td>
<td>72500782</td>
<td>9330</td>
<td>JLG</td>
<td>2646ES</td>
<td>2015</td>
<td>4970</td>
<td>0200234567</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>70</td>
<td>72500781</td>
<td>9330</td>
<td>JLG</td>
<td>E300AJP</td>
<td>2015</td>
<td>15355</td>
<td>0300198798</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>#</td>
<td>Vehicle ID</td>
<td>Type</td>
<td>Make</td>
<td>Model</td>
<td>Year</td>
<td>GWW</td>
<td>VIN</td>
<td>Dept ID</td>
</tr>
<tr>
<td>----</td>
<td>------------</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
<td>------</td>
<td>-----</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>71</td>
<td>72500780</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2015</td>
<td>2800</td>
<td>0200242893</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>72</td>
<td>72500779</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2015</td>
<td>2800</td>
<td>0200242954</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>73</td>
<td>72500786</td>
<td>9330</td>
<td>JLG</td>
<td>E450AJ</td>
<td>2015</td>
<td>14200</td>
<td>0300195634</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>74</td>
<td>72500785</td>
<td>9330</td>
<td>JLG</td>
<td>E450AJ</td>
<td>2015</td>
<td>14200</td>
<td>0300195463</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>75</td>
<td>72500784</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2015</td>
<td>2790</td>
<td>0200242895</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>76</td>
<td>72501487</td>
<td>9330</td>
<td>JLG</td>
<td>600AJ</td>
<td>2015</td>
<td>22655</td>
<td>0300204906</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>77</td>
<td>72501486</td>
<td>9330</td>
<td>JLG</td>
<td>600AJ</td>
<td>2015</td>
<td>22655</td>
<td>0300204907</td>
<td>P&amp;G</td>
</tr>
<tr>
<td>78</td>
<td>72550032</td>
<td>9330</td>
<td>JLG</td>
<td>1930ES</td>
<td>2016</td>
<td>2800</td>
<td>200253849</td>
<td>SIGN</td>
</tr>
</tbody>
</table>
### Performance

<table>
<thead>
<tr>
<th>Feature</th>
<th>800 A/J</th>
<th>2438 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Height</td>
<td>80 ft</td>
<td>24.38 m</td>
</tr>
<tr>
<td>Horizontal Outreach</td>
<td>59 ft</td>
<td>17.95 m</td>
</tr>
<tr>
<td>800A</td>
<td>50 ft</td>
<td>15.24 m</td>
</tr>
<tr>
<td>Up and Over Height</td>
<td>12 ft</td>
<td>3.66 m</td>
</tr>
<tr>
<td>Swing</td>
<td>360°</td>
<td>2.04 m</td>
</tr>
<tr>
<td>Platform, Side Entry</td>
<td>96 x 96 in.</td>
<td>0.24 x 0.24 m</td>
</tr>
<tr>
<td>Platform Capacity-Restricted</td>
<td>1000 lb</td>
<td>454 kg</td>
</tr>
<tr>
<td>Platform Capacity-Unrestricted</td>
<td>180 lb</td>
<td>81 kg</td>
</tr>
<tr>
<td>Platform Rotator</td>
<td>180°</td>
<td>1.09 m</td>
</tr>
<tr>
<td>Jib Length</td>
<td>6 ft</td>
<td>1.83 m</td>
</tr>
<tr>
<td>Jib Range of Articulation</td>
<td>180°</td>
<td>5.49 m</td>
</tr>
<tr>
<td>Weight**</td>
<td>34,800 lb</td>
<td>15,790 kg</td>
</tr>
<tr>
<td>Max. Ground-Bearing Pressure</td>
<td>70 psi</td>
<td>5.19 kg/cm²</td>
</tr>
<tr>
<td>Drive Speed: 4WD or 4WD</td>
<td>3.0 mph</td>
<td>4.8 km/h</td>
</tr>
<tr>
<td>Gradeability</td>
<td>10%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Turning Radius (Inside)</td>
<td>12 ft</td>
<td>3.66 m</td>
</tr>
<tr>
<td>4WD</td>
<td>7 ft</td>
<td>2.13 m</td>
</tr>
<tr>
<td>Turning Radius (Outside)</td>
<td>22 ft</td>
<td>6.71 m</td>
</tr>
<tr>
<td>4WD</td>
<td>14 ft</td>
<td>4.27 m</td>
</tr>
</tbody>
</table>

### Standard Specifications

#### Power Source
- Dual Fuel Engine: SM/Vector 3000 HP, 82 hp, 61 kW
- Diesel Engine: Deutz TD266.4 Tier 4 Final, 48.8 hp, 36.4 kW
- Fuel tank Capacity: 29 gal., 110 L

#### Hydraulic System
- Capacity: 40 gal., 151 L
- Auxiliary Power: 12V DC

#### Tires
- Standard: 15-625 Wide Lug Tread
- Optional: 18-625 Foam-Filled Tires

#### Standard Features
- Articulating Jib (800A only)
- Dual Rated Capacities (800A only)
- Outrigger Safe
- 180° Degree Hydraulic Platform Rotator
- 100° AC Receptacle in the Platform
- 5 Degree Tilt Alarm Indicator Light
- Swing-Out Engine Tray
- 12V DC Auxiliary Power
- Hi-Beamer
- Control ACE® System
- Proportional Controls
- Gulf-Wing Hooks

### Accessories & Options
- Hydraulic Drive
- Platform Console Machine
- Status Light Panel
- Lifting Tie Down Lug
- Engine Distress Warning
- All Motion Alarm
- Rim Protector Lug Tread Tires
- Engine Distress Shutdown — Selectable via Switch
- Outer Rim

#### Additional Features
- Platform Worklights
- Finished Arm Containment
- Arctic Package
- Skylight®
- Skylight® Plus
- Pipe Rack
- Skylight® Pro
- Skylight® Arctic
- SkyCutter® and Skylight® Arctic packages
- SkyLighter®/SkyLighter® Arctic Combination
- SkyPower® Package — 750 Watt Generator, power cable to platform, 30 m Air Line to Platform

### Notes
1. Provides indicator lights at platform control console for system distress, 5 degree tilt light, and fan switch status.
2. Optional: Fireman’s Basket (800A Jib only)
3. Includes engine block heater, oil, water, and oil temperature gauges, air filter, and oil pressure gauges.
4. Includes air brakes, front drum brakes, air to brake control, air filter, air dryer, and automatic injection system.
5. Includes dual front and dual rear lights, and rear mounted stop and backup lights.
6. Includes 20 ft. Flexible main power cables, auxiliary engine oil, hydraulic fluid, engine block heater, battery blanket, glow plugs, hydraulic tank heater, and automatic transmission fluid.
7. Arctic oil is required.
E450AJ

Articulating Boom Lift

Key Specs

- **Machine Width:** 5 ft 9 in. / 1.75 m
- **Platform Capacity:** 500 lb / 226.80 kg
- **Platform Height:** 45 ft / 13.72 m

**Power Source**

<table>
<thead>
<tr>
<th>Batteries</th>
<th>8 x 6V, 370 amp-hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical System</td>
<td>48 Volts DC</td>
</tr>
</tbody>
</table>

**Performance**

<table>
<thead>
<tr>
<th>Drive Speed - Platform Lowered</th>
<th>3.20 mph / 5.15 km/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradeability - 2WD</td>
<td>30 %</td>
</tr>
<tr>
<td>Platform Capacity</td>
<td>500 lb / 226.80 kg</td>
</tr>
<tr>
<td>Platform Capacity - Unrestricted</td>
<td>500 lb / 226.80 kg</td>
</tr>
<tr>
<td>Swing</td>
<td>360 Degrees</td>
</tr>
<tr>
<td>Swing Type</td>
<td>Non-Continuous</td>
</tr>
<tr>
<td>Turning Radius - Outside</td>
<td>10 ft 4 in. / 3.15 m</td>
</tr>
</tbody>
</table>
**Dimensional Data**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Clearance</td>
<td>9 in. / 0.22 m</td>
</tr>
<tr>
<td>Machine Height</td>
<td>6 ft 7 in. / 2.01 m</td>
</tr>
<tr>
<td>Machine Length</td>
<td>21 ft 2 in. / 6.45 m</td>
</tr>
<tr>
<td>Machine Width</td>
<td>5 ft 9 in. / 1.75 m</td>
</tr>
<tr>
<td>Platform Dimension A</td>
<td>2 ft 6 in. / 0.76 m</td>
</tr>
<tr>
<td>Platform Dimension B</td>
<td>5 ft / 1.52 m</td>
</tr>
<tr>
<td>Platform Height</td>
<td>45 ft / 13.72 m</td>
</tr>
<tr>
<td>Tailswing</td>
<td>Zero</td>
</tr>
<tr>
<td>Tire Size</td>
<td>240/55-17.5 Pnuematic</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>6 ft 7 in. / 2.01 m</td>
</tr>
</tbody>
</table>

**Reach Specifications**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Jib Rotation</td>
<td>0 Degrees</td>
</tr>
<tr>
<td>Horizontal Outreach</td>
<td>23 ft 9 in. / 7.24 m</td>
</tr>
</tbody>
</table>

**Reach Specifications**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Height</td>
<td>45 ft / 13.72 m</td>
</tr>
<tr>
<td>Up and Over Height</td>
<td>25 ft 3 in. / 7.7 m</td>
</tr>
<tr>
<td>Vertical Jib Rotation</td>
<td>141 Degrees</td>
</tr>
</tbody>
</table>

**General**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity - Hydraulic Reservoir</td>
<td>4 gal. / 15.14 L</td>
</tr>
<tr>
<td>Machine Weight</td>
<td>14400 lb / 6531.73 kg</td>
</tr>
</tbody>
</table>

**Key Features**

- Accessibility – up and over access, optional jib
- Maneuverability – move over uneven surfaces with Automatic Traction Control
- Productivity – work longer with longer duty cycles
- Environmentally friendly – zero emissions
## Specifications

<table>
<thead>
<tr>
<th>Models</th>
<th>Z-30/20N</th>
<th>Z-30/20N RJ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working height maximum*</td>
<td>36 ft</td>
<td>11.14 m</td>
</tr>
<tr>
<td>Platform height maximum</td>
<td>30 ft</td>
<td>9.14 m</td>
</tr>
<tr>
<td>Horizontal reach maximum</td>
<td>21 ft 5 in</td>
<td>6.53 m</td>
</tr>
<tr>
<td>Up and over clearance maximum</td>
<td>12 ft 8 in</td>
<td>3.86 m</td>
</tr>
<tr>
<td><strong>Platform length</strong></td>
<td>2 ft 6 in</td>
<td>0.76 m</td>
</tr>
<tr>
<td><strong>Platform width</strong></td>
<td>3 ft 10 in</td>
<td>1.17 m</td>
</tr>
<tr>
<td><strong>Height - stowed</strong></td>
<td>6 ft 6 in</td>
<td>2 m</td>
</tr>
<tr>
<td><strong>Length - stowed</strong></td>
<td>16 ft 9 in</td>
<td>5.11 m</td>
</tr>
<tr>
<td><strong>Storage height</strong></td>
<td>6 ft 10 in</td>
<td>2.06 m</td>
</tr>
<tr>
<td><strong>Storage length</strong></td>
<td>11 ft 6 in</td>
<td>3.5 m</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>3 ft 11 in</td>
<td>1.19 m</td>
</tr>
<tr>
<td><strong>Wheelbase</strong></td>
<td>5 ft 5 in</td>
<td>1.60 m</td>
</tr>
<tr>
<td><strong>Ground clearance - center</strong></td>
<td>3.5 in</td>
<td>0.09 m</td>
</tr>
</tbody>
</table>

## Productivity

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift capacity</td>
<td>500 lbs</td>
<td>227 kg</td>
</tr>
<tr>
<td>Platform rotation</td>
<td>180°</td>
<td>180°</td>
</tr>
<tr>
<td>Vertical jib rotation</td>
<td>180°</td>
<td>180°</td>
</tr>
<tr>
<td>Horizontal jib rotation</td>
<td>180°</td>
<td>180°</td>
</tr>
<tr>
<td>Turntable rotation</td>
<td>355° non-continuous</td>
<td>355° non-continuous</td>
</tr>
<tr>
<td>Turntable tailswing</td>
<td>zero</td>
<td>zero</td>
</tr>
<tr>
<td>Drive speed - stowed*</td>
<td>3.0 mph</td>
<td>4.8 km/h</td>
</tr>
<tr>
<td>Drive speed - raised**</td>
<td>5.6 mph</td>
<td>9.0 km/h</td>
</tr>
<tr>
<td>Gradeability - stowed***</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Turning radius - inside</td>
<td>5 ft 6 in</td>
<td>1.65 m</td>
</tr>
<tr>
<td>Turning radius - outside</td>
<td>10 ft 7 in</td>
<td>3.23 m</td>
</tr>
<tr>
<td>Ceilings</td>
<td>24 VDC proportional</td>
<td>24 VDC proportional</td>
</tr>
<tr>
<td>Tires - solid non-marking</td>
<td>22 x 8.17 x 75 in</td>
<td>0.56 x 1.82 x 18.45 m</td>
</tr>
</tbody>
</table>

## Power

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power source</td>
<td>48 VDC (eight 6 V batteries</td>
<td>48 VDC (eight 6 V batteries</td>
</tr>
<tr>
<td>Auxiliary power unit</td>
<td>24 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Hydraulic tank capacity</td>
<td>4 gal</td>
<td>15.1 L</td>
</tr>
</tbody>
</table>

## Weight****

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14,170 lbs</td>
<td>6,427 kg</td>
</tr>
<tr>
<td></td>
<td>14,220 lbs</td>
<td>6,450 kg</td>
</tr>
</tbody>
</table>

### *The metric equivalent of working height adds 2 m to platform height, U.S. adds 6 ft to platform height.
### **In fit mode, platform rated, the machine is designed to operate on firm, level surfaces only.
### ***Gradeability applies to driving on slopes. See operator’s manual for details regarding slope ratings.
### ****Weight will vary depending on options and/or country standards.

*www.genielift.com*
Self-Propelled Articulating Booms
Z*-30/20N & Z*-30/20N RJ

Features

Standard Features

Measurements
Z-30/20N
- 36 ft (11.14 m) working height
- 21 ft 5 in (6.53 m) horizontal reach
- 12 ft 8 in (3.86 m) up and over clearance
- Up to 500 lb (227 kg) lift capacity
Z-30/20N RJ
- 36 ft 2 in (10.99 m) working height
- 20 ft 6 in (6.25 m) horizontal reach
- 12 ft 8 in (3.86 m) up and over clearance
- Up to 500 lb (227 kg) lift capacity

Productivity
- 4 ft 1.22 m) jib boom with 130º working range
- Self-leveling platform
- Hydraulic platform rotation
- Fully proportional controls
- Thumb rocker steer
- Drive enable
- AC power cord to platform
- Horn
- Hour meter
- Tilt alarm
- Descant & travel alarms
- 360º non-continuous turntable rotation
- Zero tailswing and front arm swing

Power
- 48 V DC deep cycle battery pack
- 24 V DC auxiliary power
- Universal 39A battery smart charger

Platform
- Steel 3 ft 10 in (1.17 m)

Jib Options
- 4 ft (1.22 m) jib boom
- 4 ft (1.22 m) horizontal rotating jib boom

Power
- 48 V DC power source

Drive
- 2WD

Tire
- Solid rubber non-marking

Options & Accessories

Productivity
- Platform swing gate
- Half-mesh platform inserts with swing gate
- Platform top auxiliary rail
- Air line to platform
- Aircraft protection package (Not available on RJ models)*
- Hostile environment package
- Fire resistant hydraulic oil
- Biodegradable hydraulic oil
- Tool tray
- Fluorescent tube caddy
- Pipe cradle (pair)
- Flashing beacon
- Platform work lights
- Lockable platform control box cover

Power
- AGM batteries
- EE UL583 Fire Protection rating
- Battery charge indicator (BCI)
- Low voltage interrupt with BCI
- 800 watt 120VAC power inverter

* Reduces platform weight capacity to 440 lbs

Genie United States
18340 NE 78th Street
P.O. Box 97030
Redmond, Washington 98073-9730
Telephone +1 (425) 881-1800
Toll Free in USA-Canada +1 (800) 536-1800
Fax +1 (425) 883-3475

Genie Europe
The Malthings
Wharf Road
Grantham NG31 8SH
UK
Telephone +44 (0)1476 584333
Fax +44 (0)1476 584334
Email: AWP-infoEurope@terex.com

Distributed By:

www.genielift.com

A&E Standards: Building Systems
Fall Protection and Access Standards
Version 6.0 | December 2018
Page 28
BOOM LIFT JLG45

A. Articulating Boom Lift

1. Key Specs
   a. Machine Width: 5 ft 9 in./1.75 m
   b. Platform Capacity: 500 lb/226.80 kg
   c. Platform Height: 45 ft/13.72 m

2. Key Features
   a. Accessibility – up and over access, optional jib
   b. Maneuverability – move over uneven surfaces with Automatic Traction Control
   c. Productivity – work longer with longer duty cycles
   d. Environmentally friendly – zero emissions

SEE ALL SPECS

**Power Source**

<table>
<thead>
<tr>
<th>Batteries</th>
<th>8 x 6V, 370 amp-hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical System</td>
<td>48 Volts DC</td>
</tr>
</tbody>
</table>

**Performance**

| Drive Speed - Platform Lowered | 3.20 mph / 5.15 km/h |
| Gradeability - 2WD | 30% |
| Platform Capacity | 500 lb / 226.80 kg |
| Platform Capacity - Unrestricted | 500 lb / 226.80 kg |
| Swing | 360 Degrees |
| Swing Type | Non-Continuous |
| Turning Radius - Outside | 10 ft 4 in. / 3.15 m |

**Dimensional Data**

| Ground Clearance | 9 in. / 0.22 m |
| Machine Height | 6 ft 7 in. / 2.01 m |
| Machine Length | 21 ft 2 in. / 6.45 m |
| Machine Width | 5 ft 9 in. / 1.75 m |
| Platform Dimension A | 2 ft 6 in. / 0.76 m |
| Platform Dimension B | 5 ft / 1.52 m |
| Platform Height | 45 ft / 13.72 m |
| Tailswing | Zero |
| Tire Size | 240/55-17.5 Pnuematic |
| Wheelbase | 6 ft 7 in. / 2.01 m |

**Reach Specifications**

<p>| Horizontal Jib Rotation | 0 Degrees |
| Horizontal Outreach | 23 ft 9 in. / 7.24 m |
| Platform Height | 45 ft / 13.72 m |
| Up and Over Height | 25 ft 3 in. / 7.7 m |
| Vertical Jib Rotation | 141 Degrees |</p>
<table>
<thead>
<tr>
<th>General Information</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity - Hydraulic Reservoir</td>
<td>4 gal. / 15.14 L</td>
</tr>
<tr>
<td>Machine Weight</td>
<td>14400 lb / 6531.73 kg</td>
</tr>
</tbody>
</table>
UpRight

AB38 Series

- Working heights up to 13.5m (44ft)
- Electric or bi-energy
- Excellent up-and-over ability with 5.1m (20ft) working outreach at 5.6m (18ft 1in) clearance height
- Simple one-hand proportional control
- Tight inside turning radius compact 0.4m (15in)
- Efficient direct electric drive
- Optional platform rotator
- Five year structural warranty
### Specifications

<table>
<thead>
<tr>
<th></th>
<th>A339</th>
<th>A39 Lite</th>
<th>AB39 Hyd.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Working Height (max.)</strong></td>
<td>13.5m (44.5 ft)</td>
<td>13.5m (44.5 ft)</td>
<td>13.5m (44.5 ft)</td>
</tr>
<tr>
<td><strong>Platform Height (max.)</strong></td>
<td>11.45m (37.3 ft)</td>
<td>11.45m (37.3 ft)</td>
<td>11.45m (37.3 ft)</td>
</tr>
<tr>
<td><strong>Working Outreach (max.)</strong></td>
<td>6.7m (22 ft)</td>
<td>5.1m (16.7 ft)</td>
<td>5.1m (16.7 ft)</td>
</tr>
<tr>
<td><strong>Clearance Height at Max. Outreach</strong></td>
<td>5.4m (17.7 ft)</td>
<td>5.4m (17.7 ft)</td>
<td>5.4m (17.7 ft)</td>
</tr>
<tr>
<td><strong>Platform Capacity - 2 Person</strong></td>
<td>215kg (475 lbs)</td>
<td>210kg (460 lbs)</td>
<td>215kg (475 lbs)</td>
</tr>
</tbody>
</table>

**Platform Area Size (outside)**
- Overall Width B: 1.10m (3.6 ft)
- Overall Length C: 6.04m (19.8 ft)
- Gound Clearance: 430mm (16.9 in)
- Gross Weight: 2,550kg (5.653 lbs)
- Engine: 8 x 6V 220 Ah batteries, 89hp/69hp engine, Alternator combination

**Options**
- Proportional one-hand controller
- Minimal front boom overhang
- Ultra-tight inside turning radius
- Tilt alarm
- Large, two person platform
- Direct DC drive parallel wired wheel motors
- Non-marking tyres
- Duplicate boom controls
- 1 year parts/service
- 5 year structural warranty

**Standard Features**
- Flashing amber beacon
- Power cable to platform
- Manual platform rotator
- Special paint colours
- Environmental green oil

**Manufacturer**
- Upright

**Engine**
- Kubota D1505

**Fuel**
- Diesel

**Fuel Consumption**
- 0.8 l per hour

**Power**
- 8.5kW @ 3000 RPM

**Noise Level**
- 95 dB

**Diesel Tank Capacity**
- 121 liters (32 gallons)

**Battery**
- 89hp, 8000 watts

**Engine Key Switch**
- Located on upper control station

**Diagnostics**
- Automatic shut down in event of loss of pressure

*Metric working height is 2m above platform height. Working height in the U.S. is 6 ft above platform height.
Specifications subject to change without notice. Photos and diagrams in this brochure are for promotional purposes only.
Refer to appropriate user/operator’s manual for detailed instructions on the proper use and maintenance of the equipment.
### Self-Propelled Scissor Lifts
**GS-1530 & GS-1930**

#### Specifications

<table>
<thead>
<tr>
<th>Models</th>
<th>GS-1530</th>
<th>GS-1930</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurements</strong></td>
<td>US</td>
<td>US</td>
</tr>
<tr>
<td>Working height maximum</td>
<td>21 ft</td>
<td>25 ft</td>
</tr>
<tr>
<td>Platform height maximum</td>
<td>15 ft</td>
<td>20 ft</td>
</tr>
<tr>
<td>Platform height stowed</td>
<td>3 ft 2.2 in</td>
<td>3 ft 7.5 in</td>
</tr>
<tr>
<td>Platform length - outside</td>
<td>5 ft 4 in</td>
<td>5 ft 8 in</td>
</tr>
<tr>
<td>Platform length - extended</td>
<td>8 ft 4 in</td>
<td>8 ft 8 in</td>
</tr>
<tr>
<td>Slide-out platform extension desk</td>
<td>3 ft</td>
<td>3 ft</td>
</tr>
<tr>
<td>Platform width - outside</td>
<td>2 ft 5 in</td>
<td>2 ft 5 in</td>
</tr>
<tr>
<td>Guardrail height - fixed rails</td>
<td>3 ft 3 in</td>
<td>3 ft 3 in</td>
</tr>
<tr>
<td>Guardrail height - fold down (CE)</td>
<td>3 ft 7 in</td>
<td>3 ft 7 in</td>
</tr>
<tr>
<td>Iceboard height</td>
<td>6 in</td>
<td>6 in</td>
</tr>
<tr>
<td>Height-stowed - fixed rails</td>
<td>6 ft 5 in</td>
<td>6 ft 7 in</td>
</tr>
<tr>
<td>Height-stowed - fold down (CE)</td>
<td>5 ft 8 in</td>
<td>5 ft 8 in</td>
</tr>
<tr>
<td>Length-stowed</td>
<td>6 ft</td>
<td>6 ft</td>
</tr>
<tr>
<td>Length-stowed extended</td>
<td>9 ft</td>
<td>9 ft</td>
</tr>
<tr>
<td>Width</td>
<td>2 ft 6 in</td>
<td>2 ft 6 in</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>4 ft 4 in</td>
<td>4 ft 4 in</td>
</tr>
<tr>
<td>Ground clearance-center</td>
<td>2.4 in</td>
<td>2.4 in</td>
</tr>
<tr>
<td>- with pathole guards deployed</td>
<td>0.75 in</td>
<td>0.75 in</td>
</tr>
</tbody>
</table>

#### Productivity

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum platform occupancy**</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lift capacity</td>
<td>600 lbs</td>
<td>500 lbs</td>
<td>220 lbs</td>
<td>220 lbs</td>
</tr>
<tr>
<td>Lift capacity - extension desk</td>
<td>250 lbs</td>
<td>250 lbs</td>
<td>110 lbs</td>
<td>110 lbs</td>
</tr>
<tr>
<td>Drive speed - stowed</td>
<td>2.5 mph</td>
<td>2.5 mph</td>
<td>4.0 km/h</td>
<td>4.0 km/h</td>
</tr>
<tr>
<td>Drive speed - raised</td>
<td>0.5 mph</td>
<td>0.5 mph</td>
<td>0.8 km/h</td>
<td>0.8 km/h</td>
</tr>
<tr>
<td>Gradeability - stowed***</td>
<td>30%</td>
<td>30%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Turning radius - inside</td>
<td>zero</td>
<td>zero</td>
<td>zero</td>
<td>zero</td>
</tr>
<tr>
<td>Turning radius - outside</td>
<td>5 ft 1 in</td>
<td>5 ft 1 in</td>
<td>1.55 m</td>
<td>1.55 m</td>
</tr>
<tr>
<td>Raise / lower speed</td>
<td>16 / 26 sec</td>
<td>16 / 26 sec</td>
<td>16 / 26 sec</td>
<td>16 / 26 sec</td>
</tr>
<tr>
<td>Controls</td>
<td>proportional</td>
<td>proportional</td>
<td>proportional</td>
<td>proportional</td>
</tr>
<tr>
<td>Drive</td>
<td>dual front wheel</td>
<td>dual front wheel</td>
<td>dual front wheel</td>
<td>dual front wheel</td>
</tr>
<tr>
<td>Multiple disc brakes</td>
<td>dual rear wheel</td>
<td>dual rear wheel</td>
<td>dual rear wheel</td>
<td>dual rear wheel</td>
</tr>
<tr>
<td>Tiers - solid non-marking</td>
<td>12 x 4.5 x 9 in</td>
<td>12 x 4.5 x 9 in</td>
<td>12 x 4.5 x 9 in</td>
<td>12 x 4.5 x 9 in</td>
</tr>
</tbody>
</table>

#### Power

- **Power source**: 24 V DC (four 6 V 225 Ah batteries)
- **Hydraulic system capacity**: 3.75 gal | 14.2 L | 3.75 gal | 14.2 L

#### Weight******

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI CSA</td>
<td>2575 lbs</td>
<td>2070 lbs</td>
<td>1050 lbs</td>
</tr>
<tr>
<td>CE indoor</td>
<td>2710 lbs</td>
<td>2235 lbs</td>
<td>1100 lbs</td>
</tr>
<tr>
<td>AUS indoor</td>
<td>—</td>
<td>—</td>
<td>3020 lbs</td>
</tr>
</tbody>
</table>

#### Standards Compliance

- ANSI A92.5, CSA B354.2, CE Compliance, AS 1418.10

---

* The metric equivalent of working height adds 2 m to platform height. U.S. adds 6 ft to platform height.

** CSA/AUS marks GS-1530 and GS-1930 are indoor use only - (person maximum occupancy: GS-1530 and GS-1930 are indoor/outdoor use - 2 person maximum).

*** Gradeability applies to driving on slopes, uses operator’s manual for details regarding slope ratings.

****** Weight will vary depending on options and/or country standards.
## Self-Propelled Scissor Lifts

### GS-1530 & GS-1930

#### Features

<table>
<thead>
<tr>
<th>Standard Features</th>
<th>Options &amp; Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurements</strong></td>
<td><strong>Productivity Options</strong></td>
</tr>
<tr>
<td>GS-1500</td>
<td>• Folding rails with half-height swing gate</td>
</tr>
<tr>
<td>21 ft (6.57 m) working height</td>
<td>• Platform swing gate, half-height</td>
</tr>
<tr>
<td>Up to 600 lbs (272 kg) lift capacity</td>
<td>• Air line to platform</td>
</tr>
<tr>
<td>GS-1930</td>
<td>• Dual flashing beacons</td>
</tr>
<tr>
<td>25 ft (7.79 m) working height</td>
<td>• Motion alarm</td>
</tr>
<tr>
<td>Up to 500 lbs (227 kg) lift capacity</td>
<td>• Automotive horn</td>
</tr>
</tbody>
</table>

**Productivity**
- 64 x 29 in (1.63 x 0.74 m) steel platform
- Fixed rail with chain entry gate
- Folding rails with half-height swing gate (CE)
- 36 in (.91 m) extension deck
- Dual front wheel drive
- SmartLink™ - proportional lift and drive
- Universal 20 amp smart charger
- Rear recessed charger receptacle
- 25% gradability
- Platform control with battery charge indicator and diagnostic display
- On-board diagnostic system
- AC power to platform
- Lanyard attachment points
- Manual platform lowering valve
- Emergency stop at both platform and ground controls
- Rear wheel multiple disc brakes
- Front wheel hydraulic dynamic braking
- Brake release
- Swing-out component trays
- Solid non-marking tires
- Pothole guards
- Lift level sensor with audible alarm
- Descant alarm
- Electronic horn
- Hour meter

#### Power
- 24 V DC (four 6 V 225 Ah batteries)

---

**Genie United States**

18340 NE 78th Street  
P.O. Box 97000  
Redmond, Washington  98075-9730  
Telephone +1 (425) 881-1800  
Toll Free in USA/Canada +1 (800)-536-1800  
Fax +1 (425) 893-3475

---

**Distributed By:**

www.genielift.com

---

Effective Date: February 2013. Product specifications and prices are subject to change without notice or obligation. The photographs and/or drawings in this document are for illustrative purposes only. Refer to the appropriate Operator's Manual for instructions on the proper use of this equipment. Failure to adhere to the appropriate Operator's Manual when using not impeded or to information and illustrations may result in serious injury or death. This warranty is applicable in the United States and most other countries. Genie is a registered trademark of Terex South Dakota, Inc. © 2013 Terex Corporation.
LADDER PLATFORMS

LADDER PLATFORM FOR PARAPETS LESS THAN 12" HIGH

PLAN VIEW

RETURN HANDLE

DIAMOND PLATE

PARAPET

FRAMING FOR DIAMOND PLATE

ELEVATION VIEW

LADDER

ROOF PAD

MOUNTING BRACKET

24" MIN

36"

4-1/2"
LADDER PLATFORM FOR PARAPETS OVER 12" HIGH

PLAN VIEW

4-1/2"  4-1/2"

DIAMOND PLATE

RETURN HANDLE

PARAPET

FRAMING FOR DIAMOND PLATE

2½" MIN

ROOF PAD

ELEVATION VIEW

MOUNTING BRACKET

FALL PROTECTION

LADDER PLATFORM
FOR PARAPET
HIGHER THAN 12"

A&E Standards: Building Systems
Fall Protection and Access Standards
Version 6.0 | December 2018
Page 38
APPENDIX B – NAME PLATE SAMPLES

NORTHERN SAFETY EQUIPMENT
WWW.NORTHERNSAFETYEQUIPMENT.COM
ENGINEERED LIFELINE SYSTEM
INSTALLED BY
COMMISSION DATE

WARNING

Inspect system before each use in accordance with user instruction manual. Annual recertification of the system is recommended. An immediate inspection is required following any fall or damage to system.

This system is for use by trained personnel only. Use caution when using near thermal, electrical, or chemical sources.

Manufacturer’s instructions supplies with this system at the time of shipment must be followed for proper use, inspection and maintenance.

Alteration or misuse of this product, failure to follow instructions, or unauthorized substitution of system components may result in serious injury or death.

SYSTEM CAPACITY

Maximum of □ users connected to system

WARNING

310 LBS. (136KG) maximum allowable weight per user including tools & clothing
WARNING
MANUFACTURER’S INSTRUCTIONS SUPPLIED WITH THIS SYSTEM AT THE TIME OF SHIPMENT MUST BE FOLLOWED FOR PROPER USE, INSPECTION AND MAINTENANCE.
ALTERATION OR MISUSE OF THIS PRODUCT, FAILURE TO FOLLOW INSTRUCTIONS, OR UNAUTHORIZED SUBSTITUTION OF SYSTEM COMPONENTS MAY RESULT IN SERIOUS INJURY OR DEATH.
INSPECT SYSTEM BEFORE EACH USE IN ACCORDANCE WITH USER INSTRUCTION MANUAL. ANNUAL RECERTIFICATION OF THE SYSTEM IS RECOMMENDED. AN IMMEDIATE INSPECTION IS REQUIRED FOLLOWING ANY FALL OR DAMAGE TO SYSTEM.
THIS SYSTEM IS FOR USE BY TRAINED PERSONNEL ONLY. USE CAUTION WHEN USING NEAR THERMAL, ELECTRICAL, OR CHEMICAL SOURCES.

SYSTEM CAPACITY
MAXIMUM OF [ ] USERS CONNECTED TO SYSTEM
MAXIMUM OF [ ] USERS CONNECTED IN ANY SUBSPAN

WARNING
310 LBS. (136 KG) MAXIMUM ALLOWABLE WEIGHT PER USER INCLUDING TOOLS & CLOTHING

USER EQUIPMENT
[ ] ULTRA-LOK® WEB SERIES SELF RETRACTING LIFELINE
[ ] EZ STOP® II SHOCK ABSORBING LANYARD, LENGTH NOT TO EXCEED [ ] FT.

WARNING
CONNECT TO THE SYSTEM USING A SAYFLINK SLEEVE AND THE USER EQUIPMENT AS MARKED
Please see the following pages for the Operating Procedures Outline Sheet (OPOS) permission letter and sample OPOS diagram indicated in the title.
December 27, 2016

San Francisco International Airport
San Francisco, CA

Attn: Donna Pots, Safety Director

RE: SFO Fall Protection Guidelines
OPOS Permission

Dear Ms. Pots,

The C.S. Caulkins Company, Inc. is pleased to grant SFO the rights to publish our OPOS drawing in the Airport’s fall protection guidelines document. With this permission, it is our understanding that the Airport will not sell or profit from the use of our OPOS drawing document.

Sincerely;

Craig S. Caulkins
Craig S. Caulkins, P.E.
President
Standards Adoption

The “Fall Protection & Access Standards” A&E Standards, Version 6.0, December 2018 were adopted by the Standards Committee on January 7, 2019, and are effective immediately.

Confirmed:

__________________________
Geoffrey W. Neumayr, Standards Committee Chair