
SECTION 11 24 01
WINDOW CLEANERS' SUSPENDED ACCESS PLATFORM

PART 1 GENERAL

1.1 SUMMARY

- A. This is a "Performance Specification" to guide a manufacturer to create a "design – build" "Window Cleaners' Suspended Access Platform as depicted on the contract drawings and as specified below. The completed system shall operate in accordance with industry standards and it shall be based upon practicality when considering the end user as the worker operates the equipment system. All equipment shall be designed for a "heavy-duty" work cycle and shall operate with a high degree of durability and reliability.
- B. Furnish labor and materials to design, fabricate and install a powered platform, providing access from the Building's main roof to the upper BMU work deck/ catwalk with the ability to stop at any landing between for access to the ring truss catwalks located at several elevations between the upper deck and the main roof, including the following equipment and work scope:
1. Provide adequate project management to:
 - a. Assure the job progresses within the project schedule;
 - b. Coordinate and direct all field activities within this specification section; and
 - c. Provide and maintain timely liaison with the client.
 2. Suspended powered access platform (single point of suspension) with continuous engagement to dual vertical tracks. The access platform system shall be designed and furnished with a control system that enables the work platform to be remotely "called" from the top and/ or bottom landing point
 3. Operational Procedures and Maintenance Manuals.
- C. Related Work Not Included in this Contract:
1. Installation of fixtures embedded into concrete.
 2. Electrical wiring and fixtures on the building (up to and including outlets)
 3. Handrails that are permanently attached to the building and catwalks.
 4. Hose bibs
 5. Hand-held radio communication equipment
 6. Dual guide tracks that are installed from the main roof to the upper landing.
 7. OPOS

1.2 SUBMITTALS

- A. Product Data: All submittal information shall be in English. Within 45 calendar days after the Manufacturer/ Contractor has received the Construction Manager's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this section.
 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements including a written procedure of how the components of the system work together to gain access to the façade from one drop to another, particularly when equipment is transferred from one area or level to another.
 3. Scaled shop drawings, as a minimum, shall include:
 - a. Large-scale roof plans (plotted paper size shall be 24 in. x 36 in., minimum.) showing typical equipment rigging to assure clearances and space restrictions have been considered and have been accommodated and accounted for. Shop drawings shall include the BMU tower, the main roof structure, the BMU catwalk, plus each interim landing catwalk.
 - b. Provide prime mover hoist catalog cur-sheets and details.
 - c. Revisions to previously submitted shop drawings shall use a "cloud" or bubble to denote those portions of the drawing that have been changed.
 - d. All measurements, reactions and/ or forces shall be in English units.
 - e. Access work platform drawings, including but not limited to: overall dimensions, wire rope size and construction, specific accessories such as guide shoe construction and orientation, wheels, load rating plate information, and the weight of the fully assembled platform.
 - f. Access work platform's reactions on the building's guide track structure.
 - g. Clear designation of the work to be performed by other Trade Contractors and note indications that their work has been coordinated and considered by the work to be performed as part of this contract.

-
- B. All designs, calculations and drawings shall be performed and sealed by or under the direct supervision of a Professional Engineer, registered in the State of California, with specific experience and expertise in permanent window cleaning equipment.
 - C. Welder's certification for shop and field welders, in triplicate from the testing lab, shall be submitted directly to the Construction Engineer/Architect.
 - D. Manufacturer's certification for the actual wire rope used, including the wire rope's construction and breaking strength.
 - E. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Contracting Officer three copies of an Operation and Maintenance Manual compiled in accordance with provisions of Division 1 of these Specifications and per 1.02 F, below.
 - F. Maintenance, Operations, Service Manual: As a minimum, shall include:
 - 1. TABLE OF CONTENTS
 - 2. General Data Summary
 - a. Location: site
 - b. Hoist serial numbers (traction hoist, only)
 - c. Year of Construction
 - d. Manufacturer & address
 - e. Type of equipment
 - 1) Powered work Platform
 - f. Wire rope:
 - 1) Size
 - 2) Construction and finish
 - 3) Number
 - 4) Length
 - 5) Minimum Breaking Strength
 - g. All shop drawings plus Equipment Layout for all Drops, signed and sealed by P.E.
 - h. Calculations, signed and sealed by P.E.
 - i. Power supply
 - j. After sales service
 - 3. Definitions
 - 4. Warnings
 - a. General
 - b. Duty to understand and comply
 - c. Duty to inspect and maintain
 - d. Duty to train and control
 - e. Duty to avoid taking chances
 - 5. Introduction and System Description: Use extensive illustrations to describe means and methods for the entire system.
 - a. Support Equipment: list with illustrations
 - b. Suspended Equipment: list with illustrations
 - c. Safety equipment
 - d. Stabilization method
 - 6. Component check list for both "Pre-wash" and "Annual" inspections.
 - 7. Checks before rigging and use
 - a. Maintenance logs/Usage logs
 - b. Wire rope
 - c. Electric supply/cords
 - d. Platform, cage or chair
 - e. Safety equipment
 - f. labels/instructions
 - 8. Rigging, Set-up and de-rigging
 - a. Support equipment
 - b. Platform set-up
 - c. Safety equipment
 - d. Barricades, ground level protection and notice
 - 9. Checks before Operation
 - a. Loading
 - b. Wire rope tag

- c. Limit switches
- d. Communication system
- e. Security of tools, etc.
- f. Fire protection
- g. Safe access/egress
- 10. Operation
 - a. Controls and functional checks
 - 1) Lifting
 - 2) Lowering
 - 3) Traversing
 - b. Safety devices
 - c. Deployment from roof
 - d. Stabilization of platform, cords, lines and ropes
 - e. Adverse weather
- 11. Troubleshooting
 - a. Pre-deployment troubleshooting
 - b. Troubleshooting once deployed
- 12. Emergency Recovery Procedure/Rescue
- 13. Final Safety Do's and Don'ts or Checklist
- 14. Maintenance
 - a. General Maintenance-Lubrication
 - b. Wiring diagram depicting electrical connections, name and symbol for each relay, switch or other device;
 - c. Parts catalog, providing replacement parts list, including identifying numbers and manufacturer;
 - d. Lubrication chart & schedule for lubrication, including the manufacturer's recommended type of lubricant;
 - e. Handling and Storage.
- 15. Warranty
- 16. Electrical Diagrams
- 17. Illustration of all labels affixed to equipment
- 18. List of Reference Material

1.3 QUALITY ASSURANCE

- A. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent requirements of governmental agencies having jurisdiction, comply with:
 - 1. City and State Building Codes, as applicable.
 - 2. CAL OSHA Division of Industrial Safety, General Industry Safety Orders, Title 8, Articles 5 & 6;
 - 3. Federal OSHA Part 1910, Paragraph 1910.66, Powered Platforms for Building Maintenance;
 - 4. ASME A 120.1, Safety Requirements for Powered Platforms and Traveling Ladders and Gantries for Building Maintenance;
 - 5. AISC "Specification of the Design, Fabrication, and Erection of Structural Steel for Buildings;"
 - 6. The Aluminum Association's "Aluminum Design Manual";
 - 7. AWS D1.1-96 "Structural Welding Code-Steel;" and
 - 8. Pertinent standards of NEMA and NESC.
 - 9. Underwriters Laboratory: UL 1322 (platform), UL 1323 (hoist) and UL 508A (Control Panel).
 - 10. In the case of a Code or Standard conflict, the more stringent of requirements or interpretations shall govern.

1.4 WARRANTY

- A. Manufacturer's Warranty: Submit three executed copies of Manufacturer's Warranty for material and workmanship of the window cleaning equipment and system, demonstrating compliance in every respect with 1.3B, above. Any defects (not due to ordinary wear and tear, improper use or care) detected within the first two years after date of Owner acceptance shall be corrected by manufacturer, to the full satisfaction of the Owner and at no additional expense to the Owner.

- B. Certification of compliance: Upon completion of the installation, the Window Cleaning Equipment Manufacturer shall issue a certificate confirming entire compliance with the Specification and any applicable codes, standards and regulations. Additionally, the manufacturer shall certify that the equipment is compatible with the building and that the equipment system is safe to use.

PART 2 PRODUCTS

2.1 AVAILABLE MANUFACTURERS

- A. The Manufacturer or his installation subcontractor (as applicable) shall have a valid California Contractor's License and a valid city Fabrication License (as applicable).
Manufacturers offering products which may be incorporated in the work include:
1. Sky Rider Equipment Co. Inc.
1181 N. Blue Gum Street
Anaheim, CA 92806
(714) 632-6890 FAX (714) 632-0818
 2. Skymaster, Inc.
7837 Maclaren Street
City of Industry, CA 91744
(626) 913-8125 FAX (626) 336-2755
 3. Tractel Ltd., Swingstage Division
Allen Kanarek - Western US
North American Sales Director/ Manager
7 Mt. Lassen Dr., Suite D-132
San Rafael, CA 94903
(415) 446-7232 FAX (415) 446-7233

2.2 GENERAL REQUIREMENTS

- A. Structural components, except wire rope, shall have a safety factor of four-to-one (4:1) or greater. Design wire rope to have a safety factor of not less than ten-to-one (10:1).
- B. The façade access system and its work platform shall be designed for operating wind loads as directed by ASME A120.1. The installation shall be designed to withstand 100 miles per hour wind in its stored position.
- C. The façade access work platform shall be designed to provide continuous contact between the platform and the building as the platform moves up or down.
- D. Power Supply: Electrical control panels within the Exterior Building Maintenance (EBM) equipment system shall be designed to accommodate irregular power supply voltage. In the event of a power surge or a supply of low voltage, means shall be incorporated to protect the equipment's motors and circuitry. Fuses are prohibited.
- E. Prime mover hoists and all three Control panels shall be housed in a water-proof housing, complying with NEMA Type 3 or Type 4 enclosure. Control panels and other electrical equipment, such as switchboards and panel-boards that are likely to require inspection, adjustment, servicing or maintenance while energized, shall be marked to warn of potential electric arc flash hazards. The marking shall be located as to be clearly visible to personnel before inspection, adjustment, servicing or maintenance of the equipment
- F. Roof Top Controls: Control systems using inverters, drives or other sensitive electronic devices shall be provided with a means to filter or stabilize the incoming power against noise and transient voltage conditions that may otherwise cause damage or improper operation. The control box or cabinet shall employ means to shield its components from outside RF signals that may be extremely intense.
- G. Using the services of an engineer currently licensed by the State of California and in accordance with pertinent provisions of these Specifications, provide a complete design of the system and all of its components. Affix the signature and verification stamp or seal of the engineer on all design data and Reports that are submitted by the manufacturer.
- H. All electrical components shall meet the specific requirements of U.L., including U.L. labeling for each part or subassembly.

- I. All rigging hardware such as shackles, wire rope thimbles, forged loops, etc., shall be manufactured by the Crosby Group, LLC, Tulsa Oklahoma.
- J. All running wire rope sheaves shall be lubricated. Unless sealed roller bearings are used, provide means and personnel access to lubricate all sheaves.
- K. All "load-bearing" parts shall be constructed of metal.

2.3 LOAD-RATING AND WEIGHT IDENTIFICATION

- A. **EQUIPMENT:** Each suspended unit of an equipment installation shall be provided with a load-rating plate, stating the weight of the unit and load rating of the suspended unit. The load-rating plate shall be conspicuously located (on fully assembled and erected equipment), stating the weight of the unit and stating the equipment's load rating. The load-rating plate shall be of non-corrosive, permanent-type, made of metal, and securely fastened to the unit. 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 not less than 1/4 in. (6.35 mm), with the load indicated in 1/2 in. high (13 mm) figures. The letters and figures shall be maintained in a legible condition. Load rating information adhered to a plate is prohibited.
- B. **WIRE ROPE:** All wire ropes, including horizontal lifelines, wire rope linking systems, and suspension wire ropes, shall be permanently tagged and identified. The metal tag shall be made of brass whose thickness meets long-term durability needs when exposed to roof friction (as applicable), equipment relocation and other job-related challenges. A stainless steel ring or small-diameter stainless steel lanyard shall be used to connect the metal tag to the wire rope. Included on the metal tag shall be the following information: Name of company that supplied the ropes; date of installation, catalog breaking strength, and construction of the rope, and the length of the assembly or of the rope, as applicable. All lettering on the tags shall be stamped or etched into the metal.

2.4 FABRICATION

- A. Structural Aluminum Welding shall be inspected by an independent test lab using dye-penetrant (or equal). Any defects found shall be cut out, re-welded, and retested.
- B. Galvanizing:
 - 1. All portions of steel assemblies, except for mechanical parts such as pins, shackles and bolts, shall be hot dipped galvanized after fabrication in strict accordance with ASTM A123/A123M-09. Local areas of weldment that are field welded to other steel shall be stripped of galvanizing prior to welding and after assembly is welded, provide generous quantities of cold galvanizing repair paint in accordance with ASTM A780.
 - 2. Holes in tubes and pipes, required to relieve pressure during the galvanizing process, shall be plugged with lead to permanently seal the holes from moisture intrusion.
- C. **Bolts and Fasteners:** All bolts shall be stainless steel, except as allowed for below. All rivets, fasteners and washers shall be stainless steel. Bolted connections shall employ means to prohibit the nut from unintentional loosening or dislodging from its bolt. Intentional damage to the fastener's threads is an unacceptable means to achieve the above requirement for threaded portions that are not embedded in concrete. Rivets shall not be used as fasteners to connect members through which the load chain passes unless the rivets have been specifically designed for cyclic loading. **EXCEPTION:** Prime mover (hoisting machines).
- D. **Springs:** All mechanical springs shall be constructed of Stainless Steel.

2.5 POWERED CAGE (SINGLE POINT SUSPENDED ACCESS PLATFORM)

- A. The window cleaners' access platform system shall have three control stations: One on the access work platform; One at the top landing station (located on the landing, one flight of stairs below the BMU catwalk); plus One at the base landing (located on the main roof, immediately below the BMU tower). The upper and lower control stations shall not be operational unless the work platform mounted control station is locked off. Provide an emergency stop button at each of the three control stations, each capable of halting the work platform's movement. The platform shall be able to stop at the top, bottom, or any landing in between. All control panels shall be positioned waist high. The work platform shall be capable of being "called" from a remote station, top landing or base, without an operator in the work platform, unless the control panel on the

- work platform is keyed "on". Wiring between the hoist and control box shall be in conduit. Control boxes shall meet NEMA.
- B. A self-closing, spring loaded, latching access gate shall be provided on the access work platform. An interlock on the access platform's gate latch shall prohibit vertical movement of the work platform if the gate is open or ajar.
- C. Additionally, the two-wire, traction hoist powered, two-man access work platform shall have the following equipment and features:
1. The cage (600 lb. cap.) shall be electrically powered by 208V, "utilization rating", 3 phase electrical power shall be suitable for operation on 30 amp. circuit breaker and 30 amp. Electrical plug and outlets shall conform to NEMA L15-30.
 2. The work platform shall be continually engaged to vertical tracks. Guide shoe track trolleys on the work platform shall not bind on their tracks in any platform position, worker loading configuration, or wind condition.
 3. The traction hoist shall be mounted at the main roof level, immediately adjacent to the lowest landing position of the access platform. It shall be plugged into an electrical outlet immediately adjacent to the hoist.
 4. Provide a secondary wire rope system with automatic over-speed sensor and safety brake to stop and hold the platform if an over-speed condition is detected in the primary hoist rope. A primary, mechanical brake shall be applied automatically to the hoist motor shaft whenever power is not being conducted to the hoist motor. Application of power to the hoist motor shall automatically release this brake. A secondary, mechanical brake, acting directly on the hoist's sheave or wire rope shall be automatically applied if the downward platform speed exceeds 140% of rated speed. A slack wire shutoff shall be provided to halt electrical power to the hoist motor is tension is removed from the support rope. Each traction sheave (single groove) shall have a pitch diameter not less than 22 times the diameter of the wire rope used.
 5. The primary and secondary wire rope, constructed of 5/16 inch (minimum) diameter, drawn galvanized EIPS, IWRC wire, compatible with the hoist and as recommended by the hoist manufacturer, shall be tagged and collected in roof mounted electrically/ mechanically powered wire winders and they shall be protected from obstructions and damage in general, during all phases of the operation. Using mechanically crimped sleeves, suspension wire ropes shall have termination eyes that are formed to mechanical swivels (Crosby Laughlin) that pin to the structural stirrup of the work platform.
 6. The mechanical assemble, consisting of the traction hoist, wire ropes and the rope collection device shall not create "back pressure" on the wire ropes that causes the wire ropes to bind, kink or fray. The equipment operators shall not be required to perform interim maintenance procedures such as uncoiling the of suspension wire ropes. Provide powered wire winders that shall have torque limiting devises that spools cables independently from each other. The breaking surface of the torque limiting device shall bear on steel surfaces
 7. The equipment operators shall not be required to perform interim maintenance procedures such as uncoiling the of suspension wire ropes. Power wire winders shall not require manual assistance to spool the wire, including instances when the platform is not suspended.
 8. Fair lead sheaves shall direct suspension wire ropes from traction hoist to vertical run, across to upper suspension devise, a d then down to the work platform. Sheaves shall incorporate sealed roller bearings.
 9. Devices shall be included in the control system for the equipment that will provide protection against electrical overloads, three-phase reversal and phase failure. The control system shall have a separate method, independent of the direction control circuitry, for breaking the power circuit in case of an emergency or malfunction.
 10. Control cables from the lower control panel to the upper control panel shall be hard wired. The control cable from the upper control panel to the access work platform shall continually suspended and not collect in a bin. The suspended cables shall be protected against damage resulting from over-tensioning or being pinched in the vertically traveling equipment. Provide Kellum's Grip, or approved equal, cord restraint device on the control cable's upper and lower ends. Once it is installed, do not permit the control cable to contact the lower (Main) roof surface.
 11. Additionally, an independent hour meter shall be provided for each traction hoist, to record and display its time in operation, not plug in time.
 12. Spring-loaded upper travel limit switches, plus overload, and slack wire limit switches.
 13. Worker's fall protection tie-off loop.
 14. All walking surfaces (decking) shall be slip proof, under wet and dry conditions.

15. Furnish and install an anemometer, mounted on the work platform, which will accurately measure wind velocity shall be provided to alarm the equipment's operators in the even wind speeds exceed 25 MPH. During an excessive wind event, primary power to the suspended unit shall not be interrupted for up or down travel.
16. Provide two fire extinguishers; one mounted on the access work platform and one mounted adjacent to the prime mover.
17. Furnish a waterproof hoist/ reeler cover of 16-ounce neoprene impregnated nylon with underside tie fittings. All seams shall be sealed with double stitched Dacron. The "reflective silver" colored cover, when installed shall fully envelop the mechanical hoist/ reeler assembly with a snug fit.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine the areas and conditions under which work in this Section will be performed. Correct conditions Detrimental to timely and proper completion of work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provisions in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION AND SERVICE

- A. Install the work of this Section in strict accordance with the original design, the approved Submittals and Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Construction Engineer. All welding shall be performed by AWS certified welders. Field welding shall be inspected by an independent test lab.
- B. Offer a pricing option to provide service and maintenance of the equipment for a period of 5 years, utilizing factory trained service technicians twice a year, including one annual inspection each year during that time frame. If the manufacturer utilizes an outside agency to service the equipment, identify that firm.

3.4 TESTING

- A. All equipment shall be tested and so certified prior to completion of the installation and prior to the demonstration.
- B. GENERAL EQUIPMENT AND SYSTEM TEST: Upon completion of the equipment installation, and prior to the demonstration, perform a complete test of the equipment, verifying that the equipment performs in complete accordance with the contract documents, over the full range of motions and positions. Correct all deficiencies prior to demonstration. Upon completion of the system test and any consequential equipment deficiencies, prepare and submit a written report to declare that the system test and the deficiency corrections are completed.

3.5 DEMONSTRATION AND TRAINING

- A. Upon completion of all installations and prescribed equipment test(s), schedule a time with the Owner and Consultant and conduct a full demonstration of the equipment. Provide a minimum of two skilled, qualified and competent workers to perform the demonstration. Every worker shall be equipped with his own personal fall protection gear including a full body harness and energy absorbing lanyard.
- B. If there is a significant delay between the system test and the demonstration, perform a visual inspection to verify that all equipment is still present, in the correct locations, and is not damaged. Correct all deficiencies prior to demonstration.
- C. If more than one demonstration is required because the contractor/ manufacturer failed to adequately demonstrate the façade access system's workability, the contractor/ manufacturer shall pay for all travel time, on-site time, plus direct expenses of the consultant to witness subsequent demonstrations.
- D. Upon completion of the demonstration, provide training and instructions to the Owner's personnel on a separate day.

END OF SECTION