# SECTION 11 73 00
# CEILING MOUNTED PATIENT LIFT SYSTEM

## PART 1 – GENERAL

### 1.1 DESCRIPTION

Ceiling Mounted Patient Lift Systems for the transfer of physically challenged patients are specified in this section.

A. Work Included: Contractor shall provide and install ceiling lift track system, complete as shown on Drawings and as specified, including:
   1. Conveyor track and accessories
   2. Track support assemblies including support pendants, brackets, side bracing
   3. Battery powered Trolley-Hoist assemblies, including lift motor, sling-bar and hand-control
      a. Charging method: In-rail end point charging with the option of charging through hand control.
   4. Coordination and cooperation with the work specified elsewhere as required to provide a complete overhead patient lift system, as shown in the drawings and specified.

### 1.2 RELATED Work

A. Section 01 00 00, GENERAL REQUIREMENTS: Requirements for pre-test of equipment.
B. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Seismic requirements for non-structural equipment.
C. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General Electrical Requirements and items, which are common to sections of Division 26.

### 1.3 CODES AND STANDARDS

A. All work and materials shall conform to the latest ISO Standard FDIS 10535, Hoist for the Transfer of Disabled Persons – Requirements and Test Methods, the Underwriter’s Laboratory UL-2601, and IEC 60601-1.
   1. Standards – Lift motor and charging unit must conform to:
      a. EN ISO 10535:2006
      b. UL 60601-1 Edition, 2006-4-26
      c. Requirements for electrical safety and mechanical safety in IEC60601-1:2005
      d. Applicable parts of ANSI/AAMI ES60601-1:2005

e. IEC/EN 60601-1-2:2007

2. Patient Lifts and slings must be CE-marked in accordance with MDD 93/42/EEG (LVFC 2003:11)

**1.4 PERFORMANCE CRITERIA**

A. All equipment shall be designed for moderate service with operation in normal ambient temperatures 0-38 degrees C (32-100 degrees F) and normal indoor conditions, free from excessive dust, moisture and corrosive fumes.

B. Lift Motor Performance Criteria:

1. Lift motors shall be easy to uninstall and reinstall by means of a quick release trolley by facility personnel without the removal of track end stops. Lift motor will also have a means to prevent unauthorized removal from track.
2. Lift motor shall be constructed in such away that the same motor can be converted from hand control charging to in-rail constant charging.
3. Lift motor as an option shall have the ability to be utilized in other manufactures rail systems.
4. Lift motor shall be fully compatible with all other manufacturers' slings utilizing the sling loop attachment method of attaching slings to floor and ceiling lifts.
5. Lift Load Capacity: 283 kg (625 pounds) maximum capacity
6. Lift Vertical Range from lift strap electrical actuated highest stopping point to lift strap electrical actuated lowest stopping point: 2.44 meters (96 inches)
7. Lifting Speed: 38 mm/s (1.5 inches/s)with load 50 mm/s (2.0 inch/s) without load
8. Charging Unit:
   a. Electrical requirement: IN-110VAC/50-60Hz Max 0.9A, OUT-41VDC +/- 0.3 Max 0.9A
   b. Low battery charge signal – LED lamp display on motor and audible sound to be heard warning user of low battery.
9. Batteries: 24VDC (2 pcs. 12VDC) 3.2Ah NMH20XA3200
10. Motor Cover: flame-resistant ABS plastic
11. Hand Control: Electronic

12. LED Display on underside of motor showing motor functions including:
    a. Battery Charge Level
    b. Charge indicator when motor is charging
    c. Indicate Maintenance when needed
    d. Indicate error or malfunction type
13. LED Night Light actuated by Lift Motor Hand Control to be present on underside of motor.
14. Emergency Stop consisting of an easily reachable RED pull strap on underside of lift motor. Activation of emergency stop by pulling on red strap. All electrical functions of lift motor will be switched off.
15. Emergency Lowering:
    a. Electrical: Motor must be equipment with easily operable electrical lowering function in the event of handset malfunction.
    b. Mechanical: Motor must be equipment with accessible mechanical lowering function in the event of a full electrical malfunction.
16. Free fall protection
    a. Lift motor must have mechanical braking function in the event of a mechanical failure which would cause lift strap to play out of motor at an excessive speed.
17. Sound Level: Measured in accordance with ISO 3746
    a. Unloaded 55dB – with Max. Load: 57dB as
18. Pressure Hand Control: Buttons on Hand Control – 4N

C. Track performance criteria:
1. Ceiling Track shall be made from aluminum alloy grade T6063-T6 and manufacturer's specifically fabricated extruded shape to provide the specified performance criteria
2. Track size shall be computed based on the load positioned on the track system to produce the most severe conditions of stress and deflection.
    b. The total track deflection shall not exceed 1 mm per 200 mm of track length as defined according to ISO 10535:2006 – Section 7.2.1.6

3. Track curves shall be of such radius as to permit operation of lift motor carrier without binding – not to exceed 762 mm (30 inches).

D. Design Criteria:

1. Designed Safety factor of 2.0: Maximum Point Load for each rail support attachment location to be based upon the maximum capacity of the lift motor plus the estimated weight of overhead patient lift equipment(lift motor, rails, carriers, slingbar, support attachment hardware such as pendants) at each support location multiplied by a safety factor of 2.0.

E. Slings Criteria

1. Slings shall be CE-marked in accordance with MDD 93/42/EEG (LVFC 2003:11) and designed in accordance with ISO 10535:2006 Section 8 Non-rigid body support units
2. Must use sling loop attachment method of attaching slings to floor lifts and ceiling lifts
3. Manufactures slings must be both compatible with manufacturers floor lifts and ceiling lifts.

**1.5 SUBMITTALS**

A. Submit in accordance with specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B. Product Data: Submit manufacturer’s specifications, technical data, standard details and installation instructions.

C. Submit Shop Drawings, indicating general arrangement of lift equipment, electrical requirements, space requirements, finishes of components and other like data required to complete the installations.

1. Show layout of complete overhead patient lift system superimposed on the layout plan of Work by others, including structural and architectural layout of the project
2. Indicate all anchor points to structural concrete/steel
3. Show relationship to finished ceiling assemblies in Section Detail

D. Certificates: As a condition of acceptance, submit certification and reports stating equipment is installed per manufactures

specifications, weight tested, adjusted for designed operation, and is complete and ready for intended function.

E. Operations/Maintenance Manuals: Accompanying certification, submit for COR’s review and Owners use, complete operating and maintenance manuals that describe proper operating procedures, maintenance and replacement schedules, component part list, and closest factory representative for components and service.

**1.6 PRODUCT DELIVERY, STORAGE AND PROTECTION**

A. Delivery: All Products must be delivered in manufacturer's original packaging. All products, components, rails must be clearly identifiable by manufacturer's part numbers.

B. Storage: Store in dry, secure protected area as directed by Contractor.

C. Protection: Use all means necessary to protect Work of this Section before, during and after installation, including Work and materials of other trades.

D. Replacement: Any damage as a result of this Contractor's Work will be replaced, repaired and restored to original condition to the approval of the COR at no additional cost or inconvenience to the Owner.

**1.7 QUALITY ASSURANCE**

A. Work in this Section requires close coordination with Work in other Sections. Coordinate all Work to assure an orderly progress in the Project, without the removal of previously installed Work, and so as to prevent damage to finishes and products

B. Review conditions of installation, procedures and coordination with related Work.

C. Carefully inspect the installed Work of all other trades and verify that all such Work is complete and ready for the installation of this Work to properly commence.

D. Verify that all Work may be installed in complete accordance with the original design, reviewed submittals and manufacturer's recommendations.

**1.8 PRE-INSTALLATION CONFERENCE**

A. Provide and coordinate a pre-installation conference to review the requirements of a successful ceiling lift track system installation fully coordinated with Work by others.

Attendees should include, but not limited to:

1. COR
2. Manufacturer's Representative
3. Contractor's Representatives, including personnel responsible for installation of adjoining Work (Electrical, Mechanical-HVAC, Ceiling, Fire Protection)

**PART 2 – PRODUCTS**

**2.1 CEILING LIFT TRACK SYSTEM**

Manufacturer: Provide Products manufactured by Handicare USA, Inc. or approved equal.

A. Ceiling Track and Fittings:

1. The track shall be manufacturer's specifically fabricated extruded aluminum shape designed to provide the specific performance criteria. Track shall be straight, with factory prepared ends and curve sections.
2. The track size shall be computed based on the load positioned on the track system to produce the most severe conditions of stress and deflection. Total track deflection shall not exceed 1 mm per 200 mm of track length
3. Track stops shall be of the manufacturer's standard and shall be capable of withstanding the impact of a fully-loaded crane or carrier traveling at 50 percent of full load speed.
4. Track sections shall be installed with splice plates to provide flush and level connections at the operating tread of track. No welding will be permitted. All track joints must have structural support directly above joint. The maximum gap between the adjacent ends of rails at load carrying flange shall not exceed 1.6 mm (1/16-inch).
   a. Provide layout as shown on drawing using the longest practical pieces of track to minimize joints.
5. Track curves shall be of such radius as to permit operation of the lift motor carrier without binding. Maximum radius of 762 mm (30-inches).
   a. Intermediate support locations as required as determined by Manufacturer's specifications. Minimum of one support at each end of curve and one support at apex of curve.
   b. Track curved section shall be formed for accuracy and match up with the adjoining track section.
6. Track finish shall consist of a white powder-coated durable finish – RAL9010 GL70, Layer Thickness 70-90um

B. Lift Motor Units:

1. General: Provide lift motor sized and rated as required by the specified performance requirements.
2. Lift Motors and appurtenances shall be designed to withstand all stresses imposed under safe operating conditions while handling loads within the rated capacity.
3. Lift Motors are to be furnished complete with a suitable pushbutton control. Pushbutton arrangement is to be supplied with strain relief protection.
4. The braking system shall be capable under normal operating conditions with rated load to stop and hold the load when controls are released. Controlled lowering shall be limited to 120 percent of rated lowering speed. In the event of complete power failure, the load shall be stopped and held.
5. Where applicable, motors shall be totally enclosed, specifically designed for hoist service capable of starting and operating under any condition within the designed capacity and provide thermal overload protection.
6. Motors shall have designed prevention for lifting above rated capacity.
7. Motors shall incorporate an upper limit switch automatically stopping the lift motion when sling bar reaches its highest position. Motors shall incorporate a lower limit switch automatically stopping the lift motion when sling bar reaches its lowest position.
8. Provide digital scale, to determine patient's weight, on all lift motors except those installed in corridors.
9. No history of recalls

C. Slings
1. The straps shall be made of threaded nylon. The straps shall ensure the patient’s safety by preventing the patient from falling out of the sling.
2. Reusable slings should be made from a polyester material that is durable, easy to use, and able to withstand high laundry temperatures. The sling shall cradle the body of the patient.
3. Disposable slings shall be made from a sturdy and durable non-woven material.

4. Reusable slings: Manufacturer shall have available slings in sizes ranging from XXS to XXL for basic sling types, high back sling types, hygiene sling types and ambulation sling types with a standard weight limit of 300 kg (660 lbs). Disposable slings: Shall have a weight capacity of 200 kg (440 lbs) and disposable limb slings shall have a weight capacity of 150 kg (330 lbs).
5. Slings must be CE-marked in accordance with MDD 93/42/EEG (LVFC 2003:11) and be compatible with all other manufacturers loop sling compatible floor lift and ceiling lift systems
6. Sling quantities:
   a. Provide (2) reusable slings per lift in size mix to be determined by COR.
   b. Provide (25) disposable slings in size mix to be determined by COR.
   c. Provide (5) ambulation slings in size mix to be determined by COR.
   d. Provide (5) reusable turning/limb slings and (15) disposable turning/limb slings.
   e. Provide (4) hygiene slings in size mix to be determined by COR.
   f. Provide (6) Safe Handling Sheets without straps running under the patient portion of sheet.

D. Warranty Policy

1. Manufacture shall warrant that all products and services, to the original purchaser, to be free from defects in material and workmanship and will operate substantially in conformance to manufacturer's or manufacturer's suppliers published specification for a period of two (2) years. Batteries shall be warranted for a period no less than three (3) months. Overhead Patient Lift Rails shall be warranted for the life of the product.

**PART 3 – EXECUTION**

**3.1 SITE CONDITIONS**

A. Inspection:

1. Prior to installation of overhead rail system, carefully inspect the installed Work of all other trades and verify that all such

Work is complete to the point where this installation may properly commence.

2. Verify that all Work can be installed in strict accordance with all pertinent codes and regulations, the original design, approved submittals, and manufacturer’s recommendations.

B. Discrepancies: In the event of discrepancy, immediately notify the COR.

**3.2 INSTALLATION**

A. General

1. Work: Carry out using employees trained for the installation of overhead patient lift equipment; perform in a workmanlike manner as required to include all work as shown or reasonably implied by Contract Documents.
2. Standard: Install all equipment per manufacturer’s recommendations. Conform to the approved manufacturer’s latest printed installation directions and recommendations to all applicable codes and regulations, and to recognized good trade practices.
3. Hoisting: Include all temporary hoisting facilities required for the placement and installation of the lift equipment.
4. Properly align and position all equipment
5. If the distance between the suspended ceiling and anchors is more than 457 mm (18 inches) consult with manufacturer to determine if lateral braces will be required.

B. Testing

1. Each overhead patient lift system installed is required to be weight tested in the presence of the COR and a manufacturer’s field representative.
2. Weight test must confirm to manufacturer’s published weight test procedures.
3. Report of each individual system’s weight test to be provided with closing documentation.

**3.3 DEMONSTRATION AND INSTRUCTIONS**

A. Test equipment prior to demonstration. Ensure equipment, including specified accessories, is operational.

B. Provide demonstration of equipment operation and instruction to Hospital personnel.
C. Demonstrate operating capabilities of equipment and systems. Include control and safety features, and service and maintenance procedures.
D. Engage services of qualified instructor to instruct and train Hospital operating and maintenance personnel in operation, service and maintenance of equipment.

**3.4 CLEANING AND PROTECTION**

A. Repair or remove and replace defective Work as directed by COR upon completion of installation.

B. Clean finished equipment, touch-up as required.

C. All equipment shall be protected before, during and after installation.

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