

**SECTION 14245**

**HYDRAULIC PASSENGER ELEVATORS**

**PART 1 – GENERAL**

**1.01 WORK INCLUDED**

- A. Engineering and coordination with design team for complete operating hydraulic elevator including but not limited to:
  - 1. Passenger cab including cab doors.
  - 2. Guide hoistway rails and brackets, cylinder, and plunger.
  - 3. Pit buggers.
  - 4. Motors, pumps, piping, controls, and wiring up to main switch.
  - 5. Cathodic protection of cylinder.
  - 6. Excavation for below grade cylinder.
  
- B. Engineering and installation shall be sufficient to obtain approval of complete installation by governing agencies and certification for operation by the State Department of Labor and Industries Elevator Division. Provide any additional equipment or features required by governing agencies whether specified or shown or not. In case of conflict between these specifications and applicable codes or governmental requirements the more restrictive requirement shall apply.

**1.02 DESCRIPTION**

- A. The Work of this Section includes the complete and operational systems for one (1) individual and separated direct plunger type hydraulic passenger elevator with motor and pump at bottom adjacent to hoistway.

Elevator	Passenger
Net Capacity	2,500 lbs. (minimum)
Speed	100 fpm.

Clear Inside Car Size	68 inches wide x 51 inches deep
No. of Openings	3 front
No. of Stops	3
Entrance Openings Size	36 inches wide x 84 inches high
Door Operation	Single leaf opening horizontal sliding single speed

B. Elevator Operation:

1. Simple collective.
2. Independent operation with key lock to remove car from normal hall button calls. Provide two (2) keys of type approved by Owner.
3. Home landing shall be first floor.

C. Fire Emergency Service:

1. Elevator operation shall comply with most recent requirements of ASME/ANSI A17.1.
2. Fire key shall be kept in suitable emergency box in a location as reviewed by Design Consultant.
3. If smoke or heat sensing devices are wired to the elevator system to initiate the foregoing operation, install three-position key switch, third position to override automatic initiation by a sensing device.

### 1.03 REGULATORY REQUIREMENTS

A. Conform to:

1. ANSI A17.1 – American Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks.
2. ANSI C1 – National Electrical Code, Escalators and Moving Walks.
3. ANSI A17.2 – American Standard Practice for the Inspection of Elevators, Escalators, and Moving Walks.

4. WAC 296 – Rules Governing Passenger Elevators for the Handicapped.
5. ANSI A117.1 – Accessibility of Buildings by Physically Handicapped.

B. Welding: AWS D1.1

#### 1.04 **REFERENCE STANDARDS**

- A. ASTM B221 – Aluminum-Alloy Extruded Bars, Rods, Shapes, Tubes.
- B. ASTM B209 – Aluminum-Alloy Sheet and Plate.
- C. ASTM A167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. PS 1 – Construction and Industrial Plywood.
- E. FS L-P-508 – Plastic Sheet, Laminated, Decorative and Non-Decorative.
- F. ASTM A526 – Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- G. MIL-L-1914 – Lumber and Plywood, Fire Retardant Treated.
- H. AWS D1.1 – Structural Welding Code.

#### 1.05 **SAMPLES**

- A. Submit samples of finishes, materials required for cars, and finish of hoistway entrances and doors.

#### 1.06 **SHOP DRAWINGS AND PRODUCT DATA**

- A. Submit shop drawings and product data in accordance with Section 01330.
- B. Clearly indicate space requirements, general arrangement of elevator equipment, and material being supplied. Show connections, attachments, reinforcing, anchorage and location of exposed fastenings, and location and amount of loads and reactions to be carried on the building structure.
- C. Submit descriptive brochures or detail drawings of landing buttons, hall fixtures, car position indicators and car operating panels, car interior and hoistway doors and frames for review.

#### 1.07 **MAINTENANCE**

- A. Maintain entire elevator installation for one (1) year after date of Substantial Completion of Work.
- B. Include systematic examination, adjustment and lubrication of elevator equipment, repair or replace worn electrical and mechanical parts of the elevator equipment using only genuine standard parts products by manufacturer or equipment concerned.
- C. Replace seals, packing, and valves to maintain required factor of safety.
- D. Provide twenty-four (24) hour emergency callback service during maintenance period.
- E. Ensure that competent personnel handle maintenance service. Maintain locally an adequate stock of parts for replacement of emergency purposes and have qualified personnel available at such places to ensure the fulfillment of this service without unreasonable loss of time.

#### 1.08 **DELIVERY AND STORAGE**

- A. Deliver items or materials to site after area in which they are to be installed is ready to receive them in their place of final installation.
- B. Store materials in a storage area allotted and in such a manner as to prevent deterioration, damage, or loss of their essential properties.
- C. Fully protect moveable and operating equipment from weather.
- D. Wrap and crate factory finished materials in a manner to protect their finishes.

#### 1.09 **POWER CHARACTERISTICS**

- A. Elevator Apparatus: 208 volt, 3 phase, 60 Hz alternating current.
- B. Lighting: 120 volt, 60 Hz alternating current.

#### 1.10 **COLORS**

- A. Colors are specified in Colors/Materials Schedule.

#### 1.11 **ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

#### 1.12 **SUSTAINABLE BUILDING REQUIREMENTS**

See Section 01011 for sustainable building requirements affecting the Work of this Section.

### PART 2 – PRODUCTS

#### 2.01 **ACCEPTABLE MANUFACTURERS**

- A. Other Acceptable Manufacturers:
  - 1. ThyssenKrupp Elevator.
  - 2. Otis Elevators.

#### 2.02 **MATERIALS**

- A. Rolled Steel Section, Shapes, Rods: ANSI A17.1.
- B. Sheet Steel: ASTM A446, G90 Coating designation, stretcher leveled commercial grade.
- C. Stainless Steel: ASTM A167 Type 302/304, No. 4 finish.
- D. Aluminum: ASTM B221 extruded alloy; enameling quality.
- E. Plywood: PS 1, Western Softwood or Douglas Fir; good one side to MIL-L-1914 fire retardant treated.
- F. Plastic Laminate: FS L-P-508; color, texture, pattern selected by Architect from full range of Formica Brand colors.

#### 2.03 **OPERATING EQUIPMENT**

- A. Motors, pumps, controllers, hydraulic fluid reservoir, cylinder, casing, plunger, piping, guide rails, buffers, buttons, wiring, indicators, and hardware and fittings to provide a fully operational elevator.
- B. Key switches in hall with keyed cylinders keyed to building master key system.

#### 2.04 **ACCESSORIES**

- A. Telephone cabinet in car with telephone wires included in traveling cable and connection point for telephone in machine room.
- B. Key switches in hall with keyed cylinders keyed to building master key system.

#### 2.05 FINISHES

- A. Primer: Shop coat zinc oxide alkyd.
- B. Galvanizing: ASTM A526, G90 coating designation.
- C. Enamel: Shop applied baked enamel of color selected by Architect.
- D. Corrosion Protection: Fiberglass covering required for below grade cylinder casing.

#### 2.06 FABRICATION

- A. Machine: AC type specifically designed for elevator service having motor, pump, tank valves and muffler mounted and aligned on steel bedplate.
- B. Cylinder/Plunger: Machined polished steel tube having internal couplings where jointed, welded stop on bottom, sliding in high strength steel pipe cylinder having closed bottom and stuffing box with packing gland at top and all necessary piping connections.
- C. Car: Sheet steel enclosure with structural steel frame and bracing, ¾ inches fire retardant treated plywood floor and wall cladding fastened with hidden mechanical fasteners. Power operated hollow steel doors with track, roller, and frame.
- D. Car Finish: Similar to style Architectural, manufactured by Otis. Baked enamel color as selected from manufacturer's standard finish.
- E. Hoistway Entrances: Baked enamel finish on steel; 1 – ½ hour fire rating.

#### 2.07 HYDRAULIC ELEVATOR ISOLATION

- A. Tank, Pump, and Oil Valve:
  - 1. The pumps and the oil control valve(s) should be mounted inside the oil tank.

2. The tank should be isolated from direct contact with the machine room floor, on springs isolators equivalent to MASON SSLFH.
  3. Allow at least 12" of clearance between the tank and the machine room walls.
- B. Rail Guides Attachments to Structure:
1. Elevator rail guide should be isolated from direct contact with the shaft structure via MASON Type RCA isolator, or equal.
- C. Hydraulic Pipework:
1. All hydraulic pipework should be wrapped with 1" thick rigid formed fiberglass pipe insulation and 1 psf sheet lead.
  2. Hydraulic pipework penetrations through partitions should be isolated as described under Part 3 Section 15240-Vibration Isolation Specification.
  3. All hydraulic pipework supports should be isolated from direct contact with the building structure via MASON Type HD, or equal.
- D. Relays Control Panel:
1. Relay control panel should be isolated via MASON Type RCA isolator, or equal.
- E. Electrical Conduits:
1. Use flexible electrical conduit to isolate all electrical connections to the tank and the relays panel.
  2. Flex conduits should be sized large enough to allow for a non-stressed loop, unrestrained in all directions.
  3. Recommended minimum flex conduit length is 6".

## 2.08 FINISHING

- A. Non-Exposed to View Surfaces:
1. Structural and Non-Exposed Ferrous Metal Surfaces: Free surfaces of rust, oil or grease, clean with solvent, prime with two (2) coats structural steel grade primer.

2. Field Welds: Chip and clean away oxidation, flux or residue until wire brush clean, apply two (2) coats of primer.
  3. Wood: One (1) coat primer and two (2) coats semi-gloss alkyd enamel.
- B. Exposed to View Surfaces (In Car, Machine Room, and Hoistway Entrances):
1. Stainless Steel: Type 302/304 No. 4 finish.
  2. Plastic Laminate: Formica Brand, solid color 0.060 inches thick, color as selected from Formica Brand full color range by Design Consultant.
  3. Baked Enamel: Clean, degrease zinc coated metal surface, one (1) coat of zinc oxide primer sprayed and baked, two (2) coats of semi-gloss enamel sprayed and baked.
- C. Carpet: By Section 09688. Provide base for carpet installation by others.

## PART 3 – EXECUTION

### 3.01 EXAMINATION OF WORK BY OTHERS

- A. Examine work of other trades on which the Work of this Section depends. Report defects to Design Consultant in writing that may affect work of this trade or equipment operation.
- B. Ensure that shafts and openings for moving equipment are plumb, level, and in line and that pit is to proper depth, waterproofed and drained, provided with necessary cylinder opening, ladder guard.
- C. Ensure that machine room is properly illuminated, heated and ventilated and equipment foundations are correctly located.

### 3.02 HOLE FOR BELOW GRADE HYDRAULIC CYLINDERS

- A. If elevator equipment which incorporates a below grade hydraulic cylinder is proposed, provide drilling/excavation for cylinder installation. Excavation, backfilling and recompaction shall be accomplished in accordance with requirements of Section 02200.

### 3.03 PREPARATION

- A. Before fabrication, take necessary job site measurements and verify where work is governed by other trades. Check measurements of space for equipment and



means of access for installation and operation. Obtain dimensions from site for preparation of shop drawings.

- B. Ensure the following design coordination and preparatory work provided under other Sections has been properly completed to receive the elevator work:
  - 1. Supply of electric feeder wires to the terminals of the elevator control panel, including fused main line switch or circuit breaker. Provision of hoistway outlets for car light, and for light in pit and outlets in machine room for light. Furnishing of electric power for testing and adjusting elevator equipment.
  - 2. Provision of hoistway outlet for telephone.
  - 3. Supply of power for emergency cab lighting and ventilation from power panel fed by the building emergency circuits.
  - 4. Machine room enclosed and protected from moisture, with lockable door.
- C. Supply in ample time prior to installation; inserts, anchors, pipe sleeves, bearing plates, brackets, supports and bracing including setting templates and diagrams for placement.
- D. Excavate for below grade installation of hydraulic lines between machine room and elevator shaft.

### 3.04 **INSTALLATION**

- A. Perform work with competent mechanics skilled in this work and under the direct control and supervision of the elevator manufacturer's experienced foreman.
- B. Set hoistway entrances in alignment with car openings and true with plumb sill lines.
- C. Install machinery, guides, controls, car, equipment and accessories in accordance with manufacturer's instructions, applicable codes, and standards to provide a quiet, smooth operating installation, free from sidesway, oscillation, or vibration.
- D. Mount machine adjacent to hoistway on concrete foundation. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.

- E. Install and hook-up piping between machine and cylinder, run piping underground.
- F. Erect hoistway sills, headers and frames prior to erection of rough walls and doors; erect fascias and toe guards after rough walls are finished.
- G. Grout sills and hoistway entrance doors.
- H. Finish stainless steel license holders in each elevator car to suit certificate issued. Design holder with non-visible tamper-proof fastenings.

### 3.05 **CLEANING**

- A. Prior to final acceptance remove protection from finished or ornamental surfaces and clean and polish surfaces with due regard to type of material.
- B. At completion of Work of this Section, remove tools, equipment, and surplus materials from site.

### 3.06 **ADJUST AND BALANCE**

- A. Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.

### 3.07 **PROTECTION**

- A. Locate and protect moveable equipment and controls, such that they can only be operated by authorized persons.

### 3.08 **INSPECTION**

- A. Obtain and pay for inspections and permits. Make such tests as are required by regulations of authorities. Make tests in presence of Design Consultant.
- B. Final inspection shall be after elevator installation, hoisting enclosure and machine room are complete and certified by State Elevator Inspector.
- C. Inspect installation in accordance with ANSI A17.2.
- D. Deliver test certificates and permits to Architect.

END OF SECTION

## SECTION 14256

# HYDRAULIC ELEVATOR ISOLATION

### PART 1 – GENERAL

- A. The following is the vibration and noise isolation requirements for the Hydraulic Elevator planned for the KPLU Studios.

### PART 2 – PRODUCTS

#### 2.01 TANK, PUMP, AND OIL VALVE

- A. The pumps and the oil control valve(s) should be mounted inside the oil tank.
- B. The tank should be isolated from direct contact with the machine room floor on springs isolators equivalent to MASON SSLFH.
- C. Allow at least 12” of clearance between the tank and machine room walls.

#### 2.02 RAIL GUIDES ATTACHMENTS TO STRUCTURE

- A. Elevator rail guides should be isolated from direct contact with the shaft structure via MASON Type RCA isolator, or equal.

#### 2.03 HYDRAULIC PIPEWORK

- A. All hydraulic pipework should be wrapped with 1” thick rigid formed fiberglass pipe insulation and 1 psf sheet lead outside of the mechanical room (101) and elevator mechanical room (228).
- B. Hydraulic pipework penetrations through partitions should be isolated as described under Part 3 of Section 15240 – Vibration Isolation Specification.
- C. All hydraulic pipework supports should be isolated from direct contact with the building structure via MASON Type HD, or equal. Avoid wall mounting of the hydraulic piping. If wall mounting cannot be avoided, isolate hydraulic piping clamps or attachments using isolator Toko IPS as identified in the vibration specification 15200.

**2.04 RELAYS CONTROL PANEL**

- A. Relay control panel should be isolated via MASON Type RCA isolator, or equal.

**2.05 ELECTRICAL CONDUITS**

- A. Use flexible electrical conduit to isolate all electrical connections to the tank and the relays panel.
- B. Flex conduits should be sized large enough to allow for a non-stressed loop, unrestrained in all directions.
- C. Recommended minimum flex conduit length is 6'.

END OF SECTION