SECTION 14240
HYDRAULIC ELEVATORS

PART 1 - GENERAL

REQUIREMENTS OF SECTION 14200 APPLY TO THE WORK OF THIS SECTION. REQUIREMENTS OF THIS SECTION ARE IN ADDITION TO THOSE SPECIFIED IN SECTION 14200. VERIFY THAT HYDRAULIC ELEVATOR WILL OPERATE WITHIN SPECIFIED TOLERANCES WHEN PISTON IS FULLY EXTENDED. IF ADAPTABILITY OF HYDRAULIC ELEVATOR TO THE REQUIRED HEIGHT IS IN QUESTION, CONSIDER THE USE OF A TRACTION ELEVATOR. THE USE OF PISTON ELEVATORS SHOULD BE AVOIDED WHERE THE PISTON MUST OPERATE BELOW THE WATER TABLE. OBTAIN SPECIFIC APPROVAL FOR THE USE OF "HOLELESS" OR "ROPED" (INDIRECT) HYDRAULIC ELEVATORS.

1.1 SUMMARY:

A. Section Includes:

1. Specific requirements for hydraulic elevators. Comply with the requirements of Section 14200 regarding the work of this Section.

B. Related Sections:

1. Section 02351 - Elevator Jack Hole: Including installation of casing provided under this section.

2. Section 14200 - Elevator, General.

1.2 SUBMITTALS:

A. Shop Drawings:

1. Submit shop drawings showing pump layout and cylinder or well hole location.

1.3 QUALITY ASSURANCE:

A. Manufacturer Qualifications:

1. The elevator equipment shall be manufactured as an integrated system by an manufacture who is regularly engaged in the design and manufacture of hydraulic elevators and who designs and manufactures the power unit and the various electrical and mechanical safety systems, except that the fixtures, motor, pump, and valves may be manufactured by qualified manufacturers of these items to the elevators company's specifications.

B. Tolerances:

1. Plumb and secure guide rails within an overall tolerance of 0.063" per 100' (measured with no wind or solar load on building) and within 0.01" joint offset on rail surfaces. Limit short-span tolerance (measured between upper and lower car

guides, continuously) to 0.063".

PART 2 - PRODUCTS

2.1 MACHINES AND EQUIPMENT:

A. Hydraulic Machines:

1. Provide manufacturer's standard single-acting direct hydraulic plunger-cylinder unit for each elevator, with electric pump-tank-control system equipment in machine room.

2. Provide solid state controls.

3. Provide emergency manual lowering valve to release hydraulic pressure and permit car to be lowered.

B. Machine Location:

1. Provide elevator machinery and components designed for location adjacent to hoistway, approximately at the level of the lowest landing served by the elevator.

C. Well Hole Casings:

1. Standard Type: 16 gage corrugated galvanized steel pipe casing of diameter suitable for hydraulic jack unit.

HEAVY DUTY TYPE ONLY TO BE USED AT UNSTABLE SOIL CONDITIONS OR WHERE FUTURE CONSTRUCTION PLANS MAY CAUSE CASING TO MOVE OUT OF PLUMB. DELETE STANDARD TYPE WHEN HEAVY DUTY TYPE IS USED.

2. Heavy Duty Type: Minimum 18" diameter, minimum, steel pipe with 1/4" wall thickness and 1/2" thick steel plate welded to bottom of casing.

D. Electrolysis Protection:

1. Provide PVC or fiberglass reinforced plastic cylinder lining for casing to fit closely around jack unit. Fabricate with watertight sealed bottom, gasketed seal flange at top and two 1" I.D. PVC elbows and caps near top of casing. Fill with U-160 electrolytic protection.

E. Low Oil Control Protective Circuit:

1. In the event the car should stall due to low oil in the system, or if for other cause the car fails to reach the top landing within a predetermined time while traveling "up", a special circuit shall be provided which shall automatically return the car to the bottom landing and open the doors, after which the elevator will be completely shut down.

2. Service shall be restored by recycling the mainline switch.

F. Pumping Plant:

1. Pumping plant shall be self-contained cabinet unit with sound reducing enclosure.
2. Controller:

a. Integral, with door operating relays combined with controller.
b. Solid state reduced voltage motor starter and horsepower rated start switch.
c. Three manual reset overload relays, one in each line, and reverse phase relay.

3. Design controller equipment room to reduce sound and vibration transmission.

G. Valve:

1. Provide UC2A Maxton valve with two-way constant speed.

2.2 LEVELING SYSTEM:

A. Automatic two-way leveling and releveling. Leveling accuracy ±1/4". Provide VS1A by Motion Control Engineering (no substitutions).

2.3 MICROCOMPUTER ELEVATOR CONTROL SYSTEM:

A. Manufacturer: Motion Control Engineering (no substitutions).

B. Model: HMC 1000 and VS1A landing system.

C. Include the following features and options.

1. On board diagnostic station.
2. Secured access to computer diagnostic capability.
3. Modem communication link with controller.
4. UL and CSA labels.
5. Solid state, reduced voltage starting.
6. Permanent display of calls, car position and direction, key modes of operation and condition codes.
7. Door motor protection timer.
8. Single wire registration and acknowledgment.
9. Stuck button protection feature to keep any stuck car call or hall call from holding car at floor.
10. Test feature to allow adjustment of elevator without door operation or interfering with hall calls.
11. Hi/lo inspection speed selector switch.
12. Relay panel inspection switch to allow manual operation of car from machine room.

13. CMS Monitoring System
14. Basic Security Package

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Piping:

1. Install piping without routing underground.

B. Electrolytic Protection:

1. Prior to installation of hydraulic plunger, test integrity of protective coating with megger. Repair or recoat if electrical leakage is detected.

2. Provide PVC casing liner for plunger assembly with bottom cap and set in casing at proper elevation, accurately centered and plumb (within manufacturer's tolerance). Extend PVC sleeve through pit floor slab to underside of jack support beams. Seal watertight at liner flange. Fill space between liner and jack unit with Union Guard 160 poured or pumped into filler elbow with both pipes uncapped. Install caps tightly to both pipes. Seal well hole opening at pit floor with hydraulic quick setting cement so that pit waterproofing is maintained.

3. Where heavy duty well hole casing is used, fill space between PVC liner and steel pipe with loose, clean sand after jack unit is set.

3.2 PROTECTION:

A. Provide complete inspection and maintenance service for elevators in temporary service, if any, for the period of such service. General Contractor to pay costs related to temporary elevator use.

3.3 TESTING:

A. In addition to Section 14200 requirements, perform tests of the following:

1. Pressure relief valve and manual lowering valve.
2. Scavenger valve.
3. Protective circuit.
4. Relief valve setting.
5. Check remote piping for leaking and supports.
6. Pressure switch.

END OF SECTION 14240