Guide for Hydraulic Freight Elevator

PRIDCO (S-1340-0-82-00)

San Juan, PR

Carga #7



Prepared by:

DÍAZ. CONSULTING LLC.
EXPERIENCIA TÉCNICA

[redacted]

HYDRAULIC – FREIGHT ELEVATOR UPGRADE

(Modernization)

PART 1. GENERAL

Section 1.01 SUMARY

(A) This guide provides the general requirements for systems, components, and related equipment for elevator upgrade in Puerto Rico Industrial Development Company (Fomento Industrial)

Section 1.02 SCOPE OF WORK

(A) Furnish and install pre-engineered systems, components and equipment conforming in all aspects to the guides, schedules, and/or as shown on plans or drawings or as indicated by Owner or Owner representative.

(B) Furnish and install any accessories required for elevators upgrade and operation and recommended by manufacturer and/or required by codes.

(C) All work shall be performed in a first class and safe manner.

Section 1.03 JOB SITE

(A) Job Site Information:

Puerto Rico Industrial Development Company
(Fomento Industrial)
301 Calle Soldado Rafael Lamar Guerra,
San Juan, 00918

Section 1.04 PROPOSAL

(A) The bid proposal with pertinent bid documentation shall be addressed to:

Puerto Rico Industrial Development Company
(Fomento Industrial)
301 Calle Soldado Rafael Lamar Guerra,
San Juan, 00918
Attention to Eng. Edgardo Lugo

(B) The bidder is responsible of visiting and inspecting the project and familiarizes himself with the existing conditions.

(C) Bidders assume full responsibility for errors and omissions in their Proposals.

(D) All inquiries and questions shall be officially considered in writing by US postal mail or electronics mail.

(E) The bidder is responsible to notify any condition or omission not taken into consideration on these guidelines. The notification shall be submitted in writing to the owner and consultants.

(F) The bidder shall submit any situation considered under his analysis as hidden damage or related prior to the final submission of the bid.

Section 1.05 INSURANCE AND BOND

(A) The Elevator Contractor must provide a general liability policy with an insurance company registered under the Insurance Commissioner of Puerto Rico with the following limits:

(a) Commercial General Liability (per Occurrence):

1) Each Occurrence - $1,000,000.00
2) Fire Damage (anyone fire) - $250,000.00
3) Medical. Expenses (anyone person)- $10,000.00
4) Personal and Adv. Injury - $1,000,000.00
5) General Aggregate - $1,000,000.00
6) Products-Comp/OP Agg - $1,000,000.00

(b) Employer's Liability:

1) E.L. Each Accident - $1,000,000.00
2) E.L. Disease-Policy Limit - $1,000,000.00

(c) Automotive Liability:

1) Combine Single Limit - $1,000,000.00

(d) Performance Bonds

1) A Performance Bond in the minimum amount of 100% of the contract amount totaling the duration of contract is required under this contract to guarantee the faithful performance of the contract and all obligations arising there under. This Performance Bond shall be renewed proportionally if the service contract is renewed.

(e) Provide a Hold Harmless Agreement that must state: Elevator Contractor and its insurer will hold harmless and release the Owner from and against any and all claims, demands and/or suits, whether judicial or extrajudicial, for any cause whatsoever, arising out of, or related to, the execution of this contract, and the Contractor and its insurer will defend the Owner from such claims, demands and or suits and will bear all the expenses for such defense.

(f) The policy shall include the Owner as additional insured.

(B) The Elevator contractor shall be responsible to submit all insurance certificates.

(C) The Elevator contractor shall obtain all insurance certificates requested and submitted before starting any work.

(D) All insurance and Bonds shall pay and maintained during the life of the contract and all policies shall include an endorsement to provide that sixty (60) days prior notice shall be given to the owner before cancellation.

Section 1.06 RELATED STANDARDS AND REFERENCES

(A) Al7.l: 2019 American National Standards Institute (ANSI/ASME) Standards: Safety Code for Elevators and Escalators. In text, publication will be referred to as the Code.

(B) A17.2: 2020 American National Standards Institute (ANSI)

(C) Standards: Practice for the Inspection of Elevators, Escalators and Moving Walks, Inspector's Manual.

(D) American Society of Mechanical Engineers (ASME), American National Standards Institute of National Standards, Elevator and Escalator Electrical Equipment, ANSI/ASME Al7.5 - 2010

(E) American Society for Testing and Materials (ASTM), standards.

(F) American with Disabilities Act (ADA) of 1994 Federal Regulations 28 CFR Part 36, Accessibility for Building and Facilities

(G) National Electric Code (NEC) NFPA 70 Article 620 Elevators, Dumbwaiters, Escalators, Moving Walks, Wheelchair Lifts, and Stairway Chair Lifts.

(H) National Electric Manufacturers Association (NEMA), LD 3-1985

(I) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) NFPA 70 (2011; Errata 2 2012) National Electrical Code

Section 1.07 SUBMITTALS

(A) Product Data: Submit manufacturer's product data for each system proposed for use. Indicate capacities, sizes, performance, and operating characteristics, features of control system, finishes, and similar information. Indicate any variations from specified requirements. Include the following:

(a) Signal and operating fixtures, operating panels, and indicators.

(b) Cab design, dimensions, and layout.

(c) Electrical characteristics and connection requirements.

(d) Controller – Voltage, Full Load Ampere, Number of Phases, and Heat Dissipation

(e) Power Unit - Storage tank/pump assembly, Valves

1) Pump and motor: HP and RPM rating, Voltage, Starting and Full Load Ampere, Number of phases, heat dissipation, and Gallons per minute.

(f) Car Safety Device: Rupture Valve and Manual Shut Off Valves.

(g) Electric Door Operator; HP, RPM, Voltage, and Ampere rating of motor.

(h) Hoistway Doors and Interlocks

1) Dimensions, Material, and color

(i) Sump Pump, Drum, Spill Kit, and Dolly

(j) Cab Ventilation Unit; HP rating and CFM rating.

(k) Car slide guides/roller guides. lb.

(l) Infrared curtain

(m) Maintenance and diagnostic tools

(n) Operation and Maintenance Data:

1) Operation, maintenance data, and Repair Action Plan (in compliance with the A17.1 Section 8.6)

2) Maintenance Schedule Chart and Log

(o) Shop Drawing Requirements

1) Provide assembly and arrangement of elevator, accessories, and supporting systems.

2) Provide details for materials and equipment, including but not limited to operating and signal fixtures, doors.

(B) Submit complete wiring diagrams and sequence of operations, which show electrical connections and functions of elevator systems, for the machine room, entrances and hoistway.

(a) Provide one set of wiring diagrams in plastic or glass cover, framed, and mounted in the elevator machine room. Deliver 3 set to owner.

(b) Coded diagrams are not acceptable unless adequately identified.

(c) Elevator contractor shall provide complete schematics and wiring diagrams for control systems including information for change of program, on board diagnostics or memories, or other “on board” switches or settings.

Section 1.08 QUALITY ASSURANCE

(A) Elevator contractor has technical qualifications of at least ten years of successful experience, trained supervisory and installation personnel, and facilities to install elevator equipment specified herein.

(B) Elevator contractor, Installer and Maintenance Qualifications:

(a) Contractor must:

1) Be a certified by PROSHA as Elevator Contactor in Puerto Rico.

2) Have installed and maintained four (4) or more similar installations within the last five (5) years.

3) Directly employ sufficient competent personnel within 10 miles radius of project to handle warranty and maintenance requirements.

4) Keep stock of parts adequate for replacement on permanent or emergency basis during warranty period.

(C) Elevator contractor shall submit a list of three or more prior building installations where all the elevator equipment he proposes to furnish on this project has performed satisfactorily together under conditions of normal use. The list shall include projects that have been in operation for a period of not less than two years preceding the date of these guides; include the names and addresses of the building and the names of the administrators.

(D) Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of codes, laws, and/or authorities, including revisions and changes in effect:

(a) Safety Code for Elevators and Escalators, ASME A17.1 – 2019

(b) Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2 -2020

(c) National Electrical Code, NFPA 70 - latest edition

(d) Americans with Disabilities Act, ADA

(e) Local Fire Authority Compliance

(E) PROSHA, By law # 18

(F) Life Safety Code, NFPA 101

(G) Any work involving the installation of elevator equipment and components shall be under the responsibility of installer who is licensed as elevator company in Puerto Rico. Furnish data to the Contracting Officer for verification that such experience is possessed by the person exercising direct supervision of the work.

Section 1.09 WARRANTY

(A) Defective is defined to include, but not limited to; operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar no satisfactory conditions.

(B) The elevator contractor acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The guarantee period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

(C) Retained and Reuse Equipment:

(a) All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition.

(b) Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions. No proration of equipment or parts shall be allowed under preventive maintenance provision.

Section 1.10 DELIVERY, STORAGE AND HANDLING

(A) Elevator contractor shall be responsible for the material handling of all elevator equipment to site storage area. Elevator contractor will be responsible for keeping all stored materials inside storage area with lock and key.

(B) Deliver elevator materials, components, and equipment in manufacturer's protective packaging.

(C) Store materials in a dry area. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.

(D) Should the building or the site not be prepared to receive the elevator equipment prior to the agreed date, the Owner representative is not responsible to provide a proper and suitable storage area on or off the premises.

Section 1.11 MAINTENANCE

(A) Warranty Maintenance

(a) Elevator contractor shall provide after completion for a period of one (1) year as part of this Contract maintenance and 24-hour callback service for the equipment furnished under this guide. This service shall also include regular examination of the alteration during regular working hours by trained employees of this Contractor, and shall include all necessary adjustments, replacement, lubrication, and cleaning to keep the equipment in proper operation, except parts made necessary by misuse, accidents or neglect caused by others.

(b) A detailed record of work performed is maintained in the machine room.

(c) The Contractor shall include all parts, materials, and labor at no additional charge to the Owner.

(d) The elevator contractor shall be responsible to service record and maintain all elevator emergency circuits (including the fire service circuit) as part of the regular elevator maintenance contract.

(e) The elevator contractor shall be responsible to inform any situation not covered under his contract.

Section 1.12 RELATED WORK

This work must be done in accordance with the codes having jurisdiction and the approved drawings, scope, or task of the elevator contractor.

(A) Pit and Hoistway:

(a) Verify that the pit has an access ladder. If not, provide.

(b) All cutting of walls, floors, or partitions, together with any repairs made necessary thereby, if any.

(c) Provide a duplex electrical receptacle (3 ft. above finished floor), light and switch in the pit. Light in the pit shall be operable from hoistway door opening.

(d) Provide an LED light fixture with guard across the entire shaft.

1) The lights must be located between floors for the convenience of the mechanics personnel and to reduce shadow areas.

2) Minimum intensity at the floor level 10 fc.

3) The lights must be turned on and off by the same switch located in the pit area for illumination purposes.

(e)Provide Sump Pump

1) Pumps shall be rated to 3,000 GPH @ 25 ft TDH (minimum).
2) Pump's motor shall be 120 V, 1 Ø, 60 Hz.
3) Shall provide (12"x12"x12" minimum) installation area on the back side of the pit (as presented on the drawings). If the manufacturer required more space for the installation of the equipment, the contractor shall follow the instructions requirement by manufacturer.
4) Shall provide top protection (cover) over the sump pump area.
5) Installation must include the required pipes, valve, and accessories for the proper operation.
6) Provide automatic operation including sensors for the detection and notification of any oil or water on the pit area. The equipment name is Oil-minder.
7) The contractor shall provide the drum with respective caps including the dolly for the mobilization and operation in case of special situation.
   a) The dolly and drum must be located on the machine room near to the oil minder and spill kit.
   b) The contactor shall submit for the approval of the consultant the dolly and drum.

(B) Machine Room:

(a)Provide a properly lighted and ventilated machine room. Lighting in Machine Room shall be LED type. Position lighting so it does not create shadows while service personnel are working on major equipment. Minimum intensity at the floor level 19 fc.

(b)Provide a 10-pound class A-B-C fire extinguisher in elevator machine room.

(c)Remove and replace existing Elevator Machine Room door with 1.5 hours fire rated door and frame without louver. Main entrance UL marking door to elevator machine room shall be self-closing/self-locking type. Including "ELEVATOR MACHINE ROOM AUTHORICED PERSONNAL ONLY".

(d)Remove all non-elevator related equipment within Elevator Machine.

(e)Adequate power from the power mains to fused disconnect switch in elevator machine room as required, including necessary fused mainline disconnect switches. All power work from mainline disconnects switches in elevator machine room to controllers and other elevator equipment shall be provided by the elevator contractor.

(f)Provide one separate 120-volt single phase circuit protected with a heavy-duty type fused disconnect switch in elevator machine room for car lighting.

(g)Provide a duplex electrical receptacle, light and switch within 18" of lock-side of jamb in machine room. Provide duplex electrical receptacle near controller and whatever additional electrical receptacles are needed to meet ANSI 17.1 and N.E.C. Codes.

1) All receptacles shall be GFCI type.

2) Light fixture shall include appropriate guard.

(h) Provide Surge Protectors to protect the elevator equipment.

(i) Provide complete 30 gallons (minimum) spill kit.

(j) Shunt Trip Disconnect (if required)

1) Provide flow switches as indicated by Fire Protection company to comply with ASME A17.1/CSA B44 and NFPA 72 for shunt trip of the main line power supply. For each elevator, provide control wiring connecting the flow switch to a shunt trip equipped circuit breaker located in the elevator machine room. Upon flow of water, flow switch will instantaneously cause opening of the shunt-trip circuit breaker and remove power from the elevator. The flow switch must also send a signal to fire alarm control panel to indicate water flow condition.

2) This work shall be coordinated with Fire Protection company, consult with Owner for details.

Section 1.13 REMOVED MATERIAL AND EQUIPMENT

(A) All equipment replaced under this guide will become the property of the Contactor. The Contractor should be responsible to dispose in the correct manner.

(B) Material or equipment removed and not reused shall be removed daily from the public or staff traffic area.

Section 1.14 ADDICIONAL REQUIREMENTS

(A) Provide protection both inside and outside of hoistway to all personnel inside or outside of hoistway areas.

(a) This includes providing and maintaining of protective barricades at hall entrances, screening of each hoistway during work and protection from trip hazards due to storage or use of materials or drop cords.

(b) Panels may be removed only while the authorized elevator personnel are to perform work in the immediate area of the unprotected opening. Authorized elevator personnel shall re-install all barriers as required to maintain the original solid and safe protection to the opening prior to leaving immediate work area of the opening.

(B) Provide due care to protect building flooring and walls from excessive debris, dirt or damage due to workmen onsite.

(C) Provide fire extinguishers so that they shall be always readily available. (If Required by the Owner)

(D) It shall be the obligation of the Elevator Company to maintain a free and clear passageway in each elevator lobby. Parts, tools, etc. shall be kept within the confines of entrance partitions.

(E) Provide temporary lighting for the duration of the contract. The temporary light needs to be permanent in the working area (machine room, hoistway and pit) prior to the work starts.

(F) Trash and debris shall be removed daily.

(G) Installed equipment not meeting these requirements shall be removed and replaced with conforming equipment at no cost to the Owner.

PART 2. PRODUCT

Section 2.01 SUMMARY

A) Modernization of one (1) freight elevator conforming to all aspects of regulations standards and codes.

Section 2.02 EQUIPMENT DESCRIPTION

(A) Actual Elevator Characteristics:

(a) Use: Freight

(b) Year: 1985

(c) Operation: Simplex

(d) Rated Capacity: 5,000 lbs.

(e) Type: Hydraulic / In-Ground

(f) Rated Speed: 150 fpm

(g) Machine Room location: Behind at ground level (as front view)

(h) Power Characteristics: 480 Volt, 3Ph, 60Hz (FIELD VERIFY)

(i) Number of Stops: 6

(j) Floor Identification: S, 1, 2, 3, 4, 5 (FIELD VERIFY)

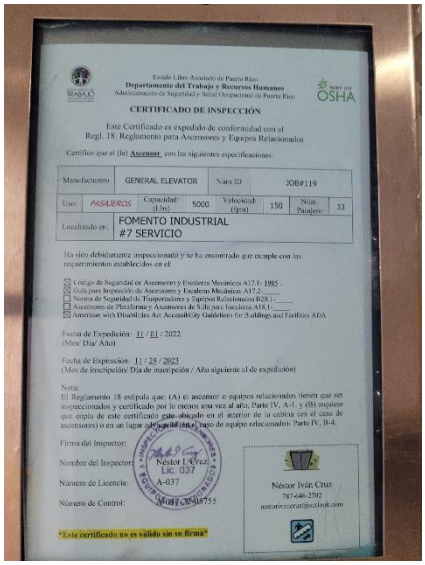
(k) Door opening: (4) Front & (2) Rear Doors.

(l) Travel: 64 ft (FIELD VERIFY)

(m) Door Type: Bi parting

(n) Existing Equipment Brand: General, Harris Preble, Maxton, Montgomery (KONE)

Section 2.03 EXISTING EQUIPMENT PHOTOS






PISO SELECCIONADO
PARA CERRAR LA PUERTA
Mantener oprimido boton de "Door Close"
PARA ABRIR LA PUERTA
Mantener oprimido boton de "Door Open"
PARA MANTENER EL CARRO EN UN PISO
Con puerta abierta, girar la llave hasta "Hold"
Con puertas abiertas, girar la llave hasta "Off"









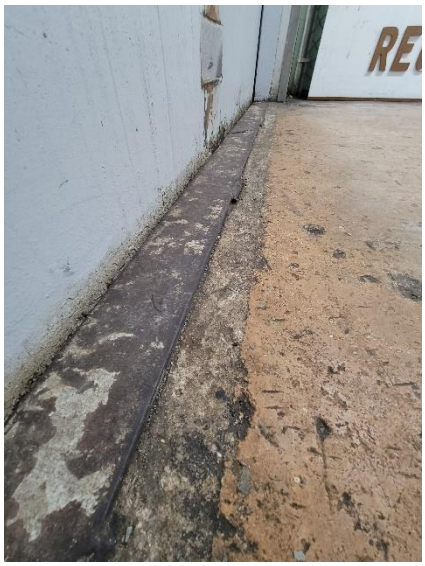


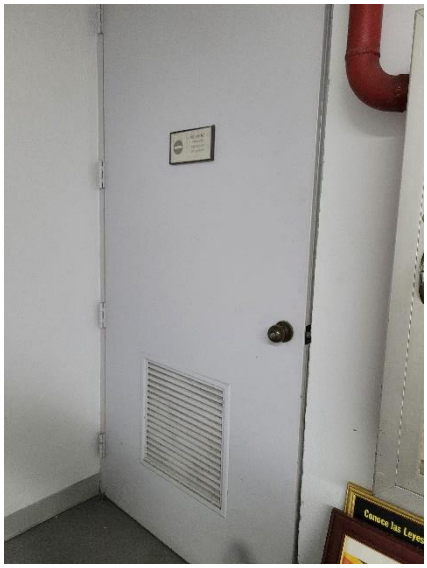





FIRE OR EMERGENCY
ELEVATOR OPERATION

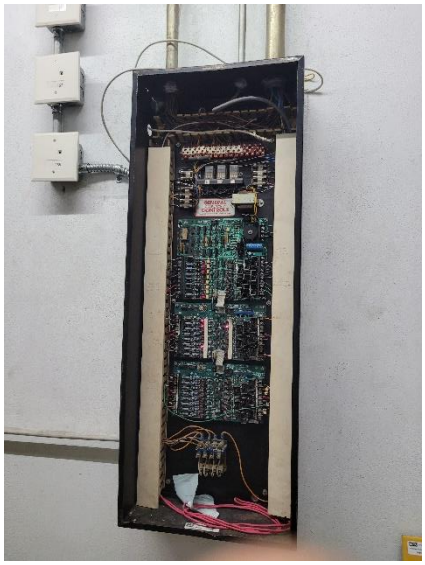




















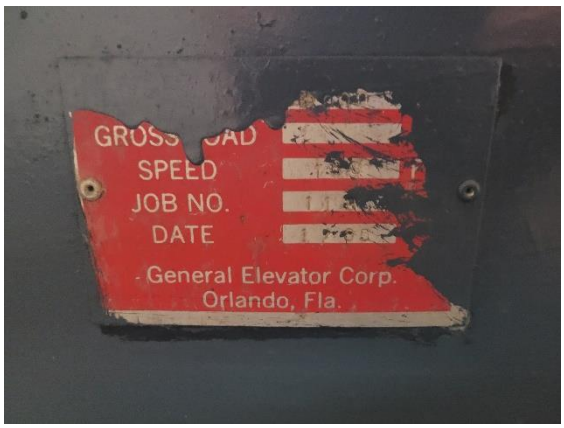

166










SPEED
JOB NO.
DATE
General Elevator Corp.
Orlando, Fla.











Section 2.04 WORKS INCLUDED

(A) Machine Room:

(a) Replace Hydraulic tank with integrated pump and control valve.

(b) Replace Overspeed Valve

(c) Hydraulic piping retrofit.

(d) Replace existing elevators controller.

(e) Refurbish and install Lighting fixture lamps.

(f) Refurbish and install electric outlets GFCI.

(g) Replace machine room door.

(h) Replace existing electrical disconnect switch.

(i) Provide proper seals for piping pass to hoistway.

(B) Pit:

(a) Replace Traveling Cable

(b) Refurbish Guide Rails

(c) Refurbish existing Buffers.

(d) Hoistway and Machine Room Wiring

(e) Replace pit switch.

(f) Provide sump pump.

(g) Refurbish plunger and cylinder.

(C) Top of the Car and Hoistway:

(a) Replace existing hoistway Terminal Stopping Devices (switches)

(b) Replace exiting Guide Rollers.

(c) Provide new doors operators.

(d) Replace existing Selector Band and Reader.

(e) Replace existing Top of Car Inspection Station.

(f) Provide Emergency Exit switch and locks.

(g) Clean and Paint each mechanical, structural or electrical component as per ASME 17.1 and 17.2 into hoistway and guidelines.

(h) Replace hoistway doors.

(i) Provide Hoistway Lighting

(D) Outside of the Hoistway:

(a) Inspect and replace Platform guard

(b) Replace existing Hall Control Stations.

(c) Replace the entrances frames on each floor.

(d) Provide Braille Indicators

(E) Cabin:
(a) Full Cabin replacement
(b) Verify the sling (frame)
(c) Replace existing Car Operating Panel
(F) Fire Service:
(a) Provide Phase 1 & 2 system
(b) Connect building Smoke Detectors.
(G) Seismic
(H) American Disability Act

PART 3. EXECTION

Section 3.01 NEW EQUIPMENT AND COMPONENTS

PART 4.

(A) Machine Room Works:
(a) Elevator Drive System:
1) General:
a) Provide elevator system that is designed for the elevator controller and pump unit to be installed in an elevator machine room.
b) Provide hydraulic elevator drive system, including pump unit, piping, tank, cylinder seals and packing replacements, control valves and associated equipment, which will operate at a maximum working pressure of 500 psi or less.
2) Power Unit:
a) Provide belt drive pump unit (ECCO), including oil-hydraulic elevator pump, electric motor, suction-line, oil strainer, and structural steel outer base with tank supports and isolation pads.
b) Provide oil tank capacity for full plunger displacement plus at least 10 gallons. Provide means to maintain oil temperature between 80- and 100-degrees F regardless of ambient temperature.
a. For this purpose, provide oil cooler with temperature controller.
b. Oil cooler shall be located over the oil tanks.
c) Oil Tank shall be sheet steel welded construction with tight fitting cover.
d) Data Plate: Attached to tank indicating oil characteristics and viscosity and pump specifications.
e) DO NOT exceed existing footprint dimensions.
f) Provide space at each side for maintenance purpose.
g) Recommend providing intermittent-duty pump motor rated at 120 starts/hour.

h) Provide motor that is sized so that the motor amperage does not exceed the motor data tag amperage in any operating condition, exclusive of acceleration and deceleration.
i) Provide a blow-outproof muffler for absorption of hydraulic pulsations shall be installed in the oil line between the pump and the cylinder.
j) Provide motor and pump nameplate and data tags permanently mounted on the outside of the pump unit frame, with all data viewable without the use of mirrors or other tools.
k) Motor power (horsepower) SHALL NOT exceed existing capacity or actual amperage capacity.
l) Do not increase horsepower.

3) Hydraulic Controls and Accessories:
a) Provide constant-velocity, down-speed regulated, control valve. Down-speed regulated control valve allows the car to travel at the same speed in the down direction, regardless of the load on the elevator.
b) Provide control valve (Maxton), valve, blowout-proof muffler, and hydraulic pump discharge strainer in the hydraulic oil supply line. Provide ball valve type manual shutoff valves in the elevator machine room.
c) In addition, the hydraulic control valve must have built-in adjustment capability to operate the elevator at 140 percent of rated speed to facilitate periodic testing of the overspeed safety valve or governor.
d) Manual Lowering Valve:
i) A manually operated valve, located on or adjacent to the control valves, shall be provided and identified, which permits lowering the car at a speed not exceeding 0.10 m/s (20 ft/min). This valve shall be so marked to indicate the lowering position.

4) Pressure Gauge Fittings:
i) A pressure gauge fitting with shutoff valve shall be provided on jack side of the check valve or immediately adjacent to the hydraulic control valve.

5) Low Oil Switch:
a) Type: Electrically operated; designed to prevent the operation of the power unit unless there is an adequate oil level at the tank.

6) Pressure Switch:
a) Type: Electrically operated; designed to prevent the operation of the lowering valve unless there is a positive pressure at the top of the cylinder.

7) Hydraulic Overspeed Safety Valve:
a) A single overspeed valve (Maxton) shall be in the pressure piping within 300mm (12 in.) of each hydraulic jack.
b) The overspeed valve shall be constructed, installed, and adjusted to ensure that the elevator obtains the following performance:

i) The overspeed valve tripping speed shall be not less than 110% nor greater than 140% of the elevator operating speed in the down direction, but in no case shall exceed 0.3 m/s 160 ft/min) above the rated elevator speed.

8) Hydraulic Piping and Accessories:
   a) Provide ASTM A53/A53M or ASTM A106/A106M, Schedule 80, black steel piping with ASME B16.9 or ASME B16.11 fittings for supply piping.
   b) Extend schedule 80 piping from the pump control valve body, inside the pump unit, to the hydraulic cylinder in the hoistway.
   c) Provide threaded forged pipe fittings for all fittings and components of the hydraulic oil supply line. Fittings shall be black steel sch-80. Cast Iron fitting are NOT Permitted.
   d) Provide pipe support each 9 ft and 6 in before and after of each elbow or change direction.
   e) Isolation coupling shall be provided to abate the transmission of noise produced by the vibration of the pump unit.
   f) Oil Strainer shall be provided and installed between the hydraulic machine and the cylinder plunger unit to protect the oil control valve during downward travel of the elevator.
   g) Pipe Sleeves:
      i) Install pipe sleeves where pipes pass through walls, floors, etc.; sleeves to be set during modernization works. After installation of piping, the sleeves shall be equipped with snug fitting inner lining of either fiberglass, firestopping or self-setting foam.

(b) Controller:

1) Provide a microprocessor-based control system to work with Hydraulic motor application to perform all the functions of safe elevator operation.
2) Every elevator controller shall comply with elevator and electrical safety codes applicable in Puerto Rico. Controller shall be UL certification.
3) System shall automatically restart when power is restored. Controller shall be capable to test and check all safeties before restart. Verify with ASME17.1 for limitations.
4) System memory shall be retained in the event of power failure or disturbance.
5) Controller shall be provided with:
   a) The highest possible level (all levels) of microprocessor control testing device, tool or maintenance terminal suitable for all, but not limited to, troubleshooting, system adjustment/modification, emergency or special code required adjustment and maintenance procedures, etc. relating to the particular type of installed controls.
   b) Phase reversal and failure protection shall be provided with the means to prevent overheating of the drive system (pump and motor) due to phase rotation reversals or failure.

c) Anticreep Operation shall be provided to automatically correct a change in car level.
d) This device shall be the sole property of the Owner and shall be of the non self-destructible and/or of the non self-changeable type.
e) the unit(s) will not be leased, borrowed, or returned to the manufacturer. Any need to re-calibrate, replace with a newer version of the unit, adjust and/or modify the unit in any way shall be provided to Owner by the Elevator Contractor at no additional cost.
f) Do not provide door pre-opening function.
g) Independent Service:
   i) Independent service operation shall be provided such that activation of a key switch in the car operating panel (COP) cancels all existing car calls and holds the doors open at the landing. When the key switch is activated, the car shall only respond to car calls disregarding all hall calls. Constant pressure on a car call button or a door close button shall be required, until the car starts to move, to close hoistway and car doors. All hall and jamb mounted lanterns shall be inactive when independent operation is activated.
h) Diagnostics:
   i) The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator status conditions as an integral part of the controller.
i) Emergency Power Operation:
   i) When emergency power generation is detected, elevator cars shall automatically continue in operation.
   ii) The emergency power signal must be connected to the controller for the proper and safe operation of the controller. The owner shall provide the signal into the elevator controller located on the machine room.
j) Automatic Lowering Device:
   i) Operation: Designed to automatically lower elevator to the lowest landing in the event of a power failure. Unit keeps doors closed until lowest landing is reached, then doors automatically open and elevator safely shuts down until normal power is restored.
k) Inspection Switch:
   i) Inspection and up/down switchgear shall be provided on the controller dashboard to allow the elevator car to be controlled manually in inspection mode of operation. Inspection operation shall only be enabled when the top-of car and in-car inspection switches are not active, and all safety and door protection circuits are on normal operation.

l) Fire Service:

i) The fireman service operation and normal operating features shall be incorporated in accordance with the American National Standard Safety Code (ANSI A17.1) and NFPA code applicable in Puerto Rico.

ii) Elevators fire service shall be activated by machine room smoke or heat detector, hoistway smoke detector and/or central fire protection system.

m) Data Plate:

i) A data plate shall be provided by the elevator contractor that indicates the A17.1 Code to be used for inspections and tests.

ii) The data plate shall be of such material and construction that the letters and figures stamped, etched, cast, or otherwise applied to the face shall remain permanently and readily legible.

iii) The data plate shall be in plain view, securely attached on the main line disconnect or on the controller. The height of the letters and figures shall be provided as per code.

(c) Machine Room Door:

1) Remove and replace existing Elevator Machine Room door with 1.5 hours fire rated door and frame without louver.

2) Provide closer and door latch, always locked from the corridor side and open from the room side. Close up all existing openings in walls enclosing the Elevator Machine Room with 1.5 hours fire rated construction.

3) Provide lettering indicate Elevators Machine Room.

4) The contractor shall provide all required labor for the installation, not limited to final requirements of the consultant (calibration, painting or any other).

(B) Pit

(a) Traveling Cable:

1) Install new traveling cables conforming with requirements of NEC. All connections to terminal blocks shall be either terminal eyelet connections or pressure wire connectors of the clamp-type that meet UL 486A requirements or stranded wire.

2) Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.

3) Provide minimum three (3) pair of shielded wires and one (1) RG-6/U type coaxial cables for security cameras.

4) Provided shielded communication wires and car lighting circuits from machine room to car connection points on elevator.
5) Provide spare conductors equal to ten percent of the total number of conductors required.
6) The outer covering must remain intact between junction boxes. Abrupt bending or twisting producing distortion of cable shall not be allowed.
7) Provide stainless steel mesh grip for hanging travelling cable conforming NEC requirements.

(b)Guide Rails:

1) Retain car guide rails in place.
   a) Clean, remove rust and lubricate as required.
2) Check all rail and bracket fastenings and tighten. Torque as recommended by bolt grade.
   a) Submit torque - tightening certification. Report any findings.
   b) Submit certification for rail guide alignment verification.

(c)Buffers (Car):

1) Retain existing.
2) Clean and remove rust from cross bracing channel and base. Use an electric grinder wire brush for these applications.

(d)Hoistway and Machine Room Wiring:

1) New travel and hoistway wiring are required. All wiring inside machine room to control system is required to be new. All runs of travel cable or hoistway cable shall include a minimum of 10% spare wires after completion of installation of all devices.
2) Provide and install all new wiring throughout the elevator machine room and hoistway, adequately sized and constructed for the proper operation of the equipment. Multi-conductor type wiring for light and signal circuits shall be used in the elevator hoistway. All conductors will be copper and the minimum size of conductors, excluding those which form an integral part of control devices, shall be No. 14 for lighting circuits and No. 18 for operating, control and signal circuits. All wiring will be installed in accordance with applicable NEC and latest applicable edition of ASME A17.1 code. Hoistway door interlock wiring will be replaced with heat resistance wiring and shall include a grounding conductor. All other new wiring will have flame retarding and moisture resistant outer covering.

3) Equipment grounding shall be provided. The equipment grounding conductor will be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC.
4) Replace all ducts and conduits in machine room and hoistway. Install new ducts and conduit as required. Conduits and raceways in as new condition may be utilized by the contractor providing no open holes or covers.
5) Hoistway travel cable and associated wiring shall be coordinated with controller manufacture for wiring configuration requirements to match all controller wiring color coded and numbered diagrams for installation.
6) Emergency Communication wiring is to be included in all wiring runs to the elevator machine room designated location.
7) Do not run shielded and power wires in the same conduit as mentioned by manufacturer.

(e)Pit Access stop switch:

1) Replace existing pit switch.
2) Emergency stop switches shall conform to the Code.
3) Provide new pit switch, toggle, or mushroom type. Switch plate shall be clearly marked (run-stop). Toggle shall be red.

(f)Ladder and pit access:

1) Existing ladders will remain.
   - Check spacing from wall and between steps.
   - Check distance from entrance to pit.
2) Paint as indicated.
3) Paint rug tubes with anti-slip grit additives.

(g)Plunger and Cylinder:

1) The plunger shall be verifying.
2) Replace the seal packing.
3) The bottom of the plunger shall be fitted with a heavy steel disc welded in place and provided with a suitable extended edge to provide a positive stop designed to prevent the plunger from leaving the cylinder.
4) The Contractor shall submit certification of alignment verification, pressures testing and no leak.
5) The top of the plunger shall be fastened to the car sling plate.

(C) Top of the Car and Hoistway:

(a) Terminal Switches:

1) Replace existing terminal devices (whole assembly).
2) Terminal switches shall conform to the Code.

(b) Guide Shoes (Rollers):

1) Rubber-tired roller guides shall be mounted on top and bottom of the car to engage the guide rails.
2) Rubber tired roller shall be at least 3 rollers for each assembly.

(c) Door Operator (front & rear):

1) Replace existing Harris Preble for Curion door operators.
2) Provide new belt, retaining cam, clutch or cams to provide positive, smooth operation. Design clutch so car doors can be closed, while hoistway doors remain open.
3) Provide all necessary hardware and material for installation.
4) Provide information to Controller manufacturer for compatibility of new door operators.
5) Install following manufacturer instructions.
6) Adjust timing closing and opening to standards and requirements by code.
7) Provide a new door protection system.
    a) Door protection shall be slim type.

(d) Selector Tape and Reader:

1) For this application selector tape shall be stainless steel.

(e) Top of Car Inspection Station:

1) Remove existing inspection stations and replace with a permanent inspection station on top of the car for inspection and maintenance including a 20A, 125V duplex GFCI receptacle and one LED ultra-white lights with guards and standard light switch.
2) The inspection station shall have a control fixture with continuous pressure buttons for up and down. The fixture will have an emergency stop button, a toggle switch to make the control operative and a fire jewel and alarm. Check other section for more requirements. Include any other ASME 17.1 requirements and not indicated.
3) Emergency Exit:
    a) Provide emergency exit switch as required in code.
    b) The top emergency exit cover must open outward and be securely attached to the car top by a chain or hinges. The chain may not be longer than 12 inches.
    c) Provided a keyed lock that is capable of being opened from inside the car with a key and from the car top without the use of "special" tools".

(f) Hoistway Doors and Accessories:

1) Frames (including jamb):
    a) The door frames need to be adjusted for the installation as required for the automatic doors.

b) The equipment requires a minimum distance for the side wall to door frame of inches, the contractor shall install a steel structure over the existing door frame to obtain the required dimensions. The minimum thickness for the overlap on the existing frame is 5 inches on each side.
c) The contractor shall submit for approval by the consultant before the order of the equipment.
   i) Replaced jamb shall be painted as indicated by the Owner.
   ii) The Contractor shall provide all labor and material.
d) Entrance frames shall be verifying and securely fastened to fixing angles mounted in the hoistway.
e) Provide all door bumpers.

2) Hangers and tracks:
   a) Replace all existing Preble Harris to Curion equipment.
   b) Certify the alignment of the tracks.
   c) Provide anyone damage or missing component.

3) Safety Device / Hoistway door lock:
   a) Replace hoistway door locks.
   b) Replace entire mechanism.
   c) Check and tighten all fastenings.
   d) Provide wiring from the hoistway riser.

4) Doors:
   a) Replace hoistway doors panels.
   b) Paint as indicated by Owner.
   c) Provide stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors and hoistway fascia in location visible from car. Provide numbering in both doors/per floor.

5) Guide Shoes (gibs):
   a) Provide new gibs.
   b) All vertical bi-parting hoistway and car doors shall have a minimum of two gibs at the sides of the doors. One of gibs shall be fire resistance.
   c) Check and tighten all fastenings.
   d) Provide all new shoes and replace the rails for smooth operation.

6) Fascia:
   a) Reuse as possible, provide anyone damage or missing.
   b) If necessary, galvanized 14-gauge sheet steel fascia shall be provided at the front of the hoistway as required by ASME 17.1 code and shall be properly supported to prevent excessive deflection so to meet code requirements “Clearance Between Loading Side of Car.

(D) Outside of the Hoistway:

(a) Hall Control Stations:

1) Hall control station shall be traditional standard.

2) Pushbuttons:

a) Provide new surface mounted faceplates (verify ADA requirements and make changes as necessary).

3) Include push buttons for each direction of travel which illuminate to indicate call registration. Push buttons shall match car operating panel.

4) Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate.

5) Provide Braille plates indicating floor number, Up and Down.

6) Pushbutton design shall match car operating panel. Submit brochure depicting provider's proposed designs with bid.

7) Provide enlarged faceplate to cover existing wall blackout and facilitate handicapped access requirements.

8) Include key switches as required in others section (Fire or Emergency situations).

9) Provide as required by ASME 17.1 code.

10) Provide Position Indicator (PI) in Hall Control Station.

11) Provide hoistway access switches for elevator at top terminal landing to permit access to top of car, and at bottom terminal landing to permit access to pit.

a) Provide switch with faceplate. Provide any cutting and patching required.

12) The hall stations shall be vandal resistant.

(b) Braille:

1) Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille adjacent.

2) Markings shall be provided on both sides of the entrance.

3) The entrance should include the elevator number identification.

(E) Cabin

(a) Car Enclosure:

1) Shell:

a) Reinforced 10-gauge galvanized sheet, Interior will be formed panels.

b) Interior side shall be painted with the color selected by the Owner.

c) In case existing shell sheet its thicker than specified, use existing gauge.

2) Canopy/Dome:

a) Reinforced 10-gauge furniture steel with lockable, hinged emergency exit.

b) In case existing shell sheet its thicker than specified, use existing gauge.

3) Ventilation:

a) Forced Ventilation:

a. Fan shall be located at top of car. Secure with bolts and grills.
b. Operation shall be 2 speeds, on-off.

4) Flooring:
   a) Replace using similar thickness with fire retardant wood as indicated by ASME 17.1, NFPA and ANSI standards.
   b) Provide under floor steel protection as require in ASME 17.1 section 2.15.
   c) Top finish flooring shall be furnished with new diamond plate of the type and color selected by Owner.
5) Car Gate (Interlock):
   a) Replace the car gate assembly and contacts.
6) Tracks:
   a) Replace the existing.
   b) Provide anyone damage or missing component.
7) Cabin Doors & Frames:
   a) Replace the bi-parting front and rear doors with steel mesh.

(b) The doors and frame shall be installed as specified by the manufacturer.

1) Lighting:
   a) Provide an emergency power unit.
   b) Totally static circuits shall be provided to illuminate the elevator car and provide current to the emergency siren in the event of building power failure.
2) Handrails & Bumpers:
   a) Provide two sides (left and right), 6” flat bar with returned ends.
      i) The handrails shall be installed as required per code (31” height from the finish floor).
      ii) The bumpers shall be installed and secure (fastened) to the floor to provide walls protection.

(c) Sling:

1) A suitable car frame shall be verified and repaired (as needed) for adequate bracing to support the platform and car enclosure.
2) Verify bolt torque and re-tight, paint as indicated.
3) Submit certification for sling alignment verification.

(d) Toe Guard:

1) Check for location and conditions.
2) Reuse and tight. Reinforce if required. Only provide any missing platform guard or anyone damage.
3) Paint as indicated by Owner or Owner representative.
4) In case of replacements, Minimum 14-gauge steel, reinforced and braced to car platform with Provider’s standard finish.

5) Shall extend a minimum 48 inch below the sill.

(e) Car Operating Panel:

1) General:
   a) One car operating panel with faceplate, consisting of:
      i) Elevator designation
      ii) Capacity in pounds
      iii) Car Position Indicator (CPI)
      iv) Emergency light (LED as standard)
      v) Inspection certificate frame
      vi) Firefighter box
      vii) Call button section.
      viii) Open door button
      ix) Close door button
      x) Alarm button
      xi) Emergency telephone button / speaker
      xii) Service box
   b) Faceplates shall be hinged to the wall side.
   c) Configure plates per ADA and ASME 17.1-2019, including Braille.
   d) Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
   e) The car operating panel shall be vandal resistant.
2) Elevator designation:
   a) Ascensor # 7 (Carga)
3) Use engraved Helvetica medium lettering for indicated total elevator capacity in pound or as Owner selection.
   a) 5,000 Lbs.
4) Car Position Indicator (CPI):
   a) Car Position Indicator: provide new alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2.5" high to indicate floor served and direction of car travel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel. Led as standards.
5) Audio Voice System:
   a) Audio voice shall announce floor designations, and direction of travel.
   b) The voice announcement system shall comply with ADA requirements for audible car position indicators.
   c) The voice announcer shall have a full range loudspeaker, located on top of the cab.

6) Emergency Light:
   a) Provide emergency light with charger and battery pack as required by code. Not less than 2 Lx (2 fc) intensity, battery at least for 4 hrs. and no minimum of two light similar in power (watts).
7) Alarm button:
   a) Provide alarm button to ring bell located on car and sound distress signal at control panel. Illuminate button when actuated.
8) Firefighter service box:
   a) Provide firefighters' Phase II key switch (On-Off-Hold) with engraved instructions filled red. Include light jewel (outside of box), buzzer, and call cancel button. Instructions shall be in English and Spanish.
9) Emergency telephone:
   a) Provide a button to activate the communication system in case of emergencies.
   b) If the communication or call is acknowledged within 45 seconds, the call shall be automatically directed to an alternated on or off-side location.
   c) "Push to Call," two-way communication instrument in car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room.
   d) "Push to Call" button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase "PUSH TO CALL," "HELP - AYUDA" engraved signage adjacent to button.
   e) Provide "Push to Call" button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel. In compliance with code A17.1-2019, section 2.26.12.1.
   f) Provide instruction to operate emergency phone in Spanish and English.
   g) The system shall comply with the code A17.1-2019, sections 2.27.1.1.3 – 2.27.1.1.5.
10) Close door button:
   a) Provide "door close" button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters' operation.
11) Open door button:
   a) Provide "door open" button to stop and reopen doors or hold doors in open position.
12) Call Button section:
   a) Include as necessary buttons and one for each floor.
   b) Include Braille number designation.
13) Service box:
   a) Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:

i)Light switch.

ii)Three-position ventilation fan switch.

iii)Independent service switch.

iv)Inspection service switch

v)Constant pressure test button for battery pack emergency lighting.

vi)120-volt, AC, GFCI protected electrical convenience outlet.

vii)In–Car Stop switch. Marked stop-run. Optional to be located outside service box and near to alarm button.

14) Inspection certification frame:

a) Provide frame to insert PROSHA inspection certification. Standard dimensions for OSHA certificate are 8”X 10” (approx..).

b) Frame shall be included on the car operating panel.

(F) Fire Service:

(a)Replace and install phase I and II in control panel.

(b)Refurbish and install smoke detectors as required by code.

1) Smoke detector shall be connected with central fire alarm system. Consult with Owner for coordination with Fire Protection company.

2) If Central fire alarm system is not available, hoistway, entrances and machine room smoke detector shall be connected to elevator controller. Machine room require heat and smoke detectors.

(c)Firefighters’ Emergency Operation Service Key switch as required by Building Code including operations required by as required by latest applicable edition of ASME A17.1.

(d)The “FIRE OPERATION” switch, the “CALL CANCEL” button, the “STOP” switch, the door open button(s), the door close button(s), the additional visual signal, and the operating instructions shall be grouped together at the top of the main car operating panel behind a locked cover.

a) The firefighters’ operation panel cover shall be open by the same key that operates the “FIRE OPERATION” switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation at the recall level. When the key is in the “FIRE OPERATION” switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.

b) All buttons and switches shall be readily accessible, located not more than (72 in.) above the floor.

c) The front of the cover shall contain the words “FIREFIGHTERS’ OPERATION” in red letters at least 0.4 in. high. Also lettering in Spanish.

d) Fire service instructions are to be either engraved or permanently mounted on the inside of the Phase 2 compartment door (in Spanish and English).

(G)Seismic Requirements:

Functions: Protect the elevator from damaging when an earthquake occurring.

(a)Rails brackets and bolts shall be verified.

(b)Rupture valve shall provide.

(c)Provide hydraulic equipment mounted on vibration isolators with seismic restraints.

(H) American Disability Act:

(a)The elevator shall comply with ANSI A17.1, the American National Standard for Accessible and Usable Buildings and Facilities.

(b)Furnish and install Braille indicators in hall station, control panel and hoistway door frame.

(c)The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of 0.25" (6.35 mm) or better under all loading conditions up to the rated load.

(d)Car Position Indicators: The controller shall have a position indicator output to drive the required position indicator which shall indicate the corresponding floor numbers as the car passes or stops at a floor. An audible signal shall sound as the position indicator changes floors.

Section 4.02 Recommended Equipment:

(A) Controller: ELEVATOR CONTROLS

(B) Traveling Cable And Hoistway: ELEVATOR CONTROLS

(C) Power Unit: EECO

(D) Control Valve: MAXTON

(E) Overspeed valve: MAXTON

(F) Door Operators: CURION

(G) Doors and Frames: CURION

(H) Fixtures: MAD

(I) Oil Coolers: EECO or ZZIPCO

(J) Rollers: DELCO or ELPRO

(K) Oil Minder: STANCOR

- The Contractor shall provide any similar or equivalent equipment for the consideration, evaluation, and approval by the consultants.

Section 4.03 WORK DURATION:

(A) The estimated work duration is between 10-12 weeks. This time does not include the manufacture time.

Section 4.04 SITE INSPECTION:

(A) Prior to beginning installation of equipment, examine hoistway and machine room. Verify that no irregularities exist which affect execution of work specified and not observed in pre-bid meeting.

(B) Do not proceed with installation until the work conditions in the place conform to project requirements, codes and standards.

(C) Examine work of other trades on which the work of this Section depends. Report defects to the Owner Representative in writing that may affect the work of this alteration.

(D) Ensure that machine room is properly illuminated, ventilated, and equipment correctly located complete with floor and access door.

(E) Before fabrication, take necessary job site measurements. Check measurement of space for equipment and means of access for installation and operation.

Section 4.05 WORK PREPARATION:

(A) Contractor shall remove the existing equipment and controls according to schedules and/or as indicated by Owner or Owner Representative.

(a) Removing include electrical connection not necessary for futures works or new equipment. Consult with Owner or Owner representative for complete scope of removing works.

(b) Final disposition of removed equipment and material shall be according with Puerto Rico environmental standards and regulations and EPA.

(B) Contractor shall permit to Owner to retain any part, accessories or material required, necessary or useful in the future, before disposal. Consult with Owner or Owner representative.

(C) Contractor shall coordinate any work with Owner or Owner representative.

(D) Contractor shall be responsible by all necessary authorizations and taxes to transport any material or equipment from distributor or fabrication facilities to installation site.

Section 4.06 INSTALLATION:

(A) Install all equipment in accordance with manufacturer instructions, referenced Codes, guides and approved submittals.

(B) Install machine room equipment with clearances in accordance with referenced Codes and guides.

(C) Install all equipment so it may be easily removed for maintenance and repair.

(D) Install all equipment to afford maximum accessibility, safety, and continuity of operation.

(E) Patching and Repairing:

(a) Contractor shall be responsible for patching and repairing any holes or penetrations.

(F) Cutting and Welding:

(a) Owner required notification process prior to performing any welding or other fire hazardous work.

Section 4.07 PAINTING AND FINISHING:

(A) All painting of hoistway, machine room floor, walls and ceiling, and elevator pit floor and walls. Including but not limited to:

(a) Support Beams
(b) Door Frame
(c) Headers
(d) Inside hall Doors
(e) Facias
(f) Rails
(g) Hoist Beams
(h) Cabin Cross Head
(i) Car Top and Railings
(j) Deflector Cover
(k) Sling
(l) Headers
(m) Sill Supports

Section 4.08 QUALITY CONTROL

(A) Work at jobsite will be checked during installation by Owner or Owner representatives. Full cooperation with Owner personnel is mandatory. Accomplish any corrective work required prior to performing further installation.

(B) The Elevator contractor shall assign supervision staff for meetings requested by the owner.

Section 4.09 PAYMENTS:

(A) The Elevator Contractor shall submit for approval the Break Down for Payments proposed to the Owner.

Section 4.10 ACCEPTANCE AND TEST:

(A) The elevator contractor shall conduct preliminary functional testing to ensure that the elevator installation is complete and ready for acceptance testing. The Owner or Owner Representative shall then schedule an acceptance inspection of the installation with the PROSHA elevator inspector selected by the Owner.

(B) The elevator contractor and any other project contractors associated with the elevator installation shall provide assistance as required to demonstrate to the PROSHA Elevator Inspector and Owner that the elevator installation is in compliance with all of the requirements of the ASME 17.1-2019.

(a) The elevator contractor shall be responsible for any re-inspection fees required on the project that is caused by their omissions or errors. Owner will discount from payment certification the cost of re-inspection. Owner will deduct $500 per day in arrears to correct any deficiencies.

(C) Testing: Elevator contractor shall provide testing of load, speed, endurance, and operation in accordance with ASME A17.2.

(a) Special Tools: Elevator contractor shall have digital tachometer and weight set of 100% of total capacity of elevators. Other tools will be required.

Section 4.11 TRAINING:

(A) On-Site Training: Contractor shall provide session of training at new installation locations on the complete operation, including rescue principles.

Section 4.12 DOCUMENTS AND INFORMATION:

(A) Non-Proprietary Equipment Design: Provide three sets of neatly bound written information necessary for proper maintenance and adjustment for equipment before final acceptance. Final retention will be withheld until data is received by Owner or Owner Representative. Include the following as minimums:

(a) Wiring diagrams of “as-installed” elevator circuits with index of location and function of components. Provide one set reproducible master (USB). These diagrams are Owner property. A legend sheet shall be furnished with each set of drawings to provide the following information:

1) Name and symbol of each relay, switch, or other apparatus.
2) Location on drawings, drawing sheet number and area, and location of all contacts.
3) Location of apparatus, whether on controller or on car.

(b) Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, biweekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

(a) Printed instructions explaining all operating features.

(c) Complete software documentation for all installed equipment.

(d) Lubrication instructions including recommended grade of lubricants.

(e) Parts catalogs listing all replaceable parts including drawings and ordering instructions.

(f) Five (5) sets of keys for all switches and control features properly tagged and marked, including emergency door release key.

(g) Diagnostic test devices together with all supporting information necessary for interpretation of test data and troubleshooting of elevator system and performance of routine safety tests.

(h) The elevator installation shall be a design that can be maintained by any licensed elevator maintenance company in Puerto Rico without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor or manufacturer.

(i) Provide upgrades and/or revisions of software during the progress of the work, warranty period, and the term of the ongoing maintenance agreement between the Owner and Elevators Contractor.