# TECHNICAL SPECIFICATIONS AND GUIDELINES

# FOR THE ALTERATION AND MODERNIZATION OF TWO PUBLIC PASSENGER ELEVATORS

## Arecibo Judicial Center
## 553 José A. Cedeño Avenue
## Arecibo, Puerto Rico 00612



CRUZ MOYA®
Elevator Consultants

Certified Women-Owned Small Business (WOSB)

**JULY 2026**

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## PART 1 – GENERAL

## 1.1 PROJECT INFORMATION

**Project Name:** Hydraulic Passenger's Elevator Upgrade and Alteration

**Location:** Arecibo Judicial Center

**Address**: 553 Ave José A. Cedeño, Arecibo, 00612

**Seismic zone**: 2 or greater (zone D)

## 1.2 PROJECT DESCRIPTION

This specification establishes the minimum requirements for the complete modernization, upgrade, and alteration of two (2) existing automatic hydraulic passenger elevators serving the public at the **Arecibo Judicial Center**, located at 553 José A. Cedeño Avenue, Arecibo, Puerto Rico 00612.

The elevators covered by this specification are two (2) existing Otis hydraulic passenger elevators originally installed in approximately 1989. Both elevators are equipped with direct-acting hydraulic jacks installed below ground. The Elevator Contractor shall verify all existing equipment data, dimensions, capacities, speeds, number of stops, electrical characteristics, and field conditions before submitting the proposal and before releasing any equipment for manufacture.

The purpose of this document is to establish the technical, safety, performance, accessibility, and code-compliance requirements necessary to modernize the existing elevators and return them to safe, reliable, maintainable, and fully operational service.

The scope of work shall include the removal, replacement, rehabilitation, testing, adjustment, and commissioning of elevator components affected by age, wear, deterioration, corrosion, obsolescence, prolonged use, and limited availability of replacement parts.

As part of the modernization, the existing below-ground hydraulic jacks and cylinders shall be removed and replaced with new direct-acting hydraulic jack assemblies. The new jacks shall be furnished with all required protective systems, including corrosion protection and any other safeguards required by the applicable provisions of ASME A17.1-2019 and the Authority Having Jurisdiction for hydraulic cylinders installed below ground.

The Elevator Contractor shall provide all necessary excavation, removal, drilling, casing, liners, seals, supports, piping connections, oil containment provisions, testing, and restoration required for the complete installation of the new hydraulic jacks. All work shall be coordinated with existing site and hoistway conditions.

Certain major existing components may be retained, including the car frames, platforms, guide rails, hoistway entrances, door panels, frames, sills, and other components specifically identified in these Specifications, provided they are inspected and determined to be structurally sound, code-compliant, compatible with the new equipment, and suitable for continued service.

All retained equipment shall be cleaned, repaired, adjusted, tested, and reconditioned as required. The reuse of any existing component shall not reduce the safety, performance, reliability, accessibility, maintainability, or anticipated service life of the modernized elevators.

Upon completion, the Arecibo Judicial Center shall be provided with two (2) fully modernized hydraulic passenger elevators offering improved reliability, maintainability, safety, accessibility, ride quality, leveling accuracy, door performance, and operational efficiency.

The completed modernization shall comply with the applicable requirements of **ASME A17.1-2019**, including the provisions governing hydraulic elevators and alterations, as well as all applicable electrical, fire alarm, accessibility, building, and local regulatory requirements enforced by the Authority Having Jurisdiction.

The modernization shall be completed with the objective of providing a new service-life cycle of approximately twenty (20) years, subject to proper preventive maintenance, operating conditions, equipment usage, and manufacturer recommendations.

The scope of work shall include, but shall not be limited to, the following:

1. The two (2) existing hydraulic passenger elevators serve the Arecibo Judicial Center and are used by the general public. The Elevator Contractor shall verify the number of stops, openings, entrance configurations, capacities, speeds, travel, and all related field conditions for each elevator before submitting the proposal and before releasing equipment for manufacture.
2. Existing hoistway entrances, corridor doors, frames, sills, headers, tracks, door panels, and related entrance components shall be inspected, cleaned, adjusted, repaired, and reconditioned as required to provide safe, smooth, reliable, and code-compliant operation with the new modernization equipment.
3. Remove the existing direct-acting hydraulic jacks installed below ground and provide new direct-acting hydraulic jack and cylinder assemblies, including all required corrosion protection, protective containment, casings, liners, seals, supports, piping connections, and safeguards required by ASME A17.1-2019 and the Authority Having Jurisdiction.
4. Provide the replacement, rehabilitation, testing, adjustment, calibration, and commissioning of all elevator-related controls, hydraulic equipment, power units, valves, electrical systems, operating devices, safety devices, door equipment, signal fixtures, emergency systems, communication equipment, and related components required for the complete modernization of both elevators.
5. Coordinate the operation of the two elevators as required by the final control arrangement and building operating needs. The completed installation shall provide safe, reliable, accessible, and efficient passenger service for the general public and authorized Judicial Center personnel.
6. Provide complete preventive maintenance and service for a minimum period of three (3) months beginning upon the Owner’s written Final Acceptance of the Work. Maintenance shall include scheduled preventive maintenance, lubrication, adjustments, callbacks, troubleshooting, replacement of defective parts, software corrections, and all labor necessary to maintain the elevators in fully operational condition.
7. Within thirty (30) calendar days after Final Acceptance, furnish the Owner with all required certificates, permits, inspection records, test reports, operation and maintenance manuals, schematic diagrams, final wiring diagrams, parts lists, warranties, and all other required closeout documentation.
8. Reuse of any existing component shall not relieve the Elevator Contractor of responsibility for the final safety, code compliance, performance, reliability, maintainability, accessibility, and proper operation of the completed modernization.
9. Provide all labor, materials, equipment, testing, coordination, incidental work, and corrections necessary to deliver two complete and fully operational modernized

hydraulic passenger elevators, whether or not every required item is specifically identified in this summary.

## 1.3 EXISTING CONDITION

The characteristics of the equipment are as follows:

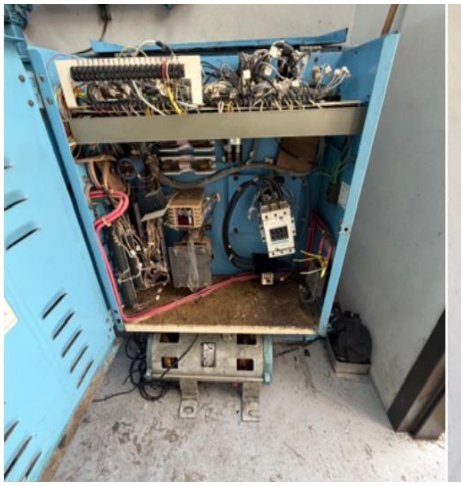
| EXISTING EQUIPMENT DATA | DESCRIPTION |
|---|---|
| Existing control panel | Otis Elevator |
| Year | 1989 |
| Rated Load – (lbs) | 3,500 lbs |
| Rated Speed - (fpm) | 150 fpm |
| Door Configuration | Center Opening. |
| Stops | 4 |
| Number of elevators in the public area | 2 |
| Control Operation | Duplex Selective Collective |
| Hydraulic Jack Type | Direct-Acting, Below-Ground |

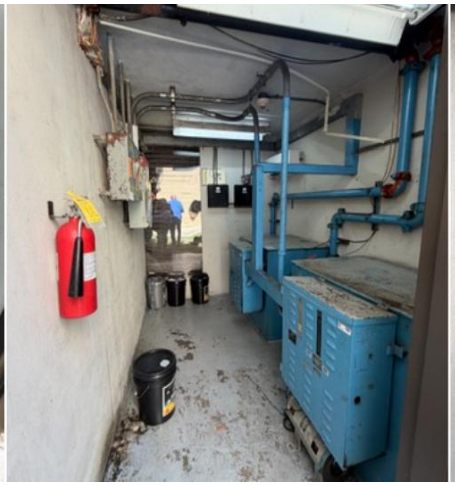
Below are photos of the existing condition of the equipment.




The existing identification plate located on top of the elevator car indicates that the elevator is rated for a capacity of **3,500 lb** and a speed of **150 ft/min**. All new modernization equipment, including the controller, hydraulic power unit, pump, motor, valve, jack assembly, safety devices, operating fixtures, and related components, shall be selected and configured for a rated capacity of **3,500 lb** and a

rated speed of **150 ft/min**, unless otherwise specifically indicated in these Specifications.








The existing machine room has limited available space and contains the controllers, hydraulic power units, disconnecting means, piping, and other equipment serving both elevators. At the time of the inspection, **Elevator No. 2, located on the right-hand side, was out of service**.

The Elevator Contractor shall carefully verify all existing machine-room dimensions, equipment locations, access routes, ceiling heights, wall clearances, door openings, electrical service locations, piping arrangements, and required working spaces before selecting or ordering any new equipment.

All proposed controllers, hydraulic power units, disconnecting means, transformers, auxiliary panels, and related components shall be selected and arranged to fit within the available machine-room space while maintaining the required electrical working clearances, access for inspection and maintenance, and safe circulation around the equipment.

The Contractor shall not assume that standard equipment layouts will fit within the existing room. Where necessary, compact or specially configured equipment shall be provided to improve the existing arrangement and achieve compliance with applicable electrical and elevator code requirements.

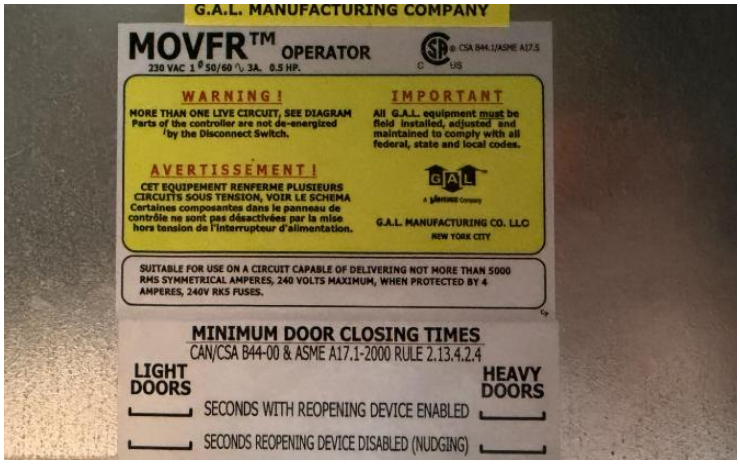




The existing hoistway entrances are provided with center-opening doors.




Elevator No. 2, located on the right-hand side, is equipped with an existing Otis door operator. The existing door operator shall be removed and replaced with a new heavy-duty door operator as specified in Part 2 – Products.







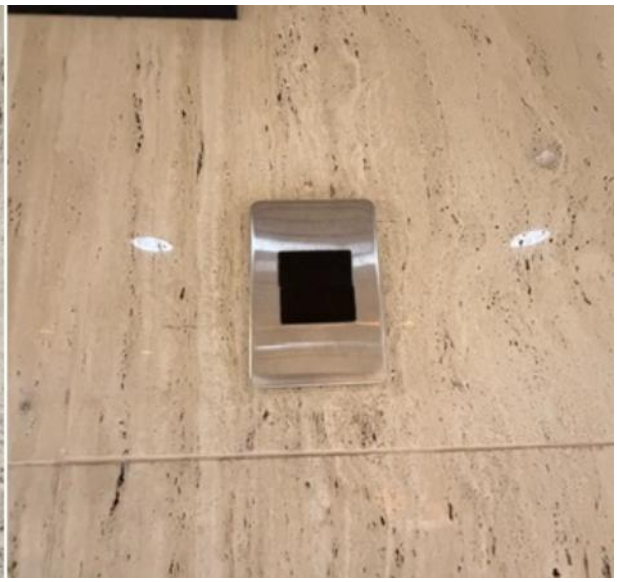
Elevator No. 1, located on the left-hand side, is equipped with an existing GAL MOVFR door operator. This operator is intended to be retained, subject to inspection, testing, adjustment, and confirmation that it is in satisfactory operating condition and compatible with the new control system. The new door operator provided for Elevator No. 2 shall be a heavy-duty GAL operator of the same or equivalent type, selected to provide similar performance, operation, and maintenance characteristics for both elevators.











Existing car operating panels, indicators, emergency communication devices, and other operating fixtures shall be removed and replaced with new equipment as specified in **Part 2 – Products**.



The existing elevators are equipped with direct-acting hydraulic jacks installed below ground. The existing jack assemblies, including the pistons and cylinders, shall be completely removed and replaced. Provide new direct-acting hydraulic jack assemblies with all corrosion protection, protective casing, sealing, supports, piping connections, and safeguards required by ASME A17.1-2019. The installation shall be properly aligned, secured, tested, and protected against groundwater infiltration, corrosion, and hydraulic oil leakage.

## 1.4 SUMMARY OF SCOPE OF WORK

The following table provides a general summary of the principal equipment, systems, and work included in the modernization of the two (2) hydraulic passenger elevators operating as a duplex group at the Arecibo Judicial Center.

This summary is provided for reference and pricing coordination only. It is not intended to define the complete contractual scope of work, nor shall it replace, limit, or modify the detailed technical requirements contained in **Part 2 – Products**, the execution requirements, special conditions and all other applicable sections of these Specifications.

The Elevator Contractor shall review the Contract Documents in their entirety and shall include all labor, materials, equipment, accessories, interfaces, testing, adjustments, documentation, permits, coordination, and incidental work required to provide two complete, safe, reliable, code-compliant, and fully operational hydraulic passenger elevators functioning as a coordinated duplex system.

## RECOMMENDATIONS FOR MODERNIZATION OF HYDRAULIC ELEVATOR DIRECT PISTON ASME A 17.1 – 2019

| MACHINE ROOM |
|---|
| 1. Replace the existing controllers with new microprocessor-based hydraulic elevator controllers complying with the applicable requirements of ASME A17.1-2019. The controllers shall be configured to operate both elevators as a coordinated duplex system.<br><br>Each controller shall include an electrohydraulic pump-motor protection function that will stop the affected elevator and return it to the lowest landing when the system detects operation on a single motor contactor, a contactor failure, or a software-related condition that causes the hydraulic-fluid temperature to exceed the permitted operating limit.<br><br>This protection shall be furnished as an integral part of the controller package and shall be specifically included in the controller order. |
| 2. Provide a new hydraulic power unit for each elevator, complete with a properly sized oil reservoir, submersible pump and motor assembly, control valve, muffler or silencer where required, shutoff valve, pressure gauge, relief valve, oil-level indicator, oil-temperature protection, piping connections, electrical protective devices, and all accessories required for safe, smooth, quiet, reliable, and code-compliant operation.<br><br>The power unit shall be selected for the existing machine-room space and for operation at the specified capacity and speed. A non-submersible arrangement shall be permitted only when the Elevator Contractor demonstrates in writing that a submersible configuration is unsuitable for the existing installation and obtains approval before ordering the equipment. |
| 3. Provide a new hydraulic control valve. |
| 4. Provide Oil Strainer |
| 5. Provide a Low Oil and temperature Control |
| 6. Supply new hydraulic oil. |
| 7. Check and replace the hydraulic piping. |
| 9. Connect smoke detectors to the control panel. |
| OVER THE CAB (WELL) |
| 1. Recondition the existing center-opening hoistway doors and retained entrance assemblies. Replace all worn or moving components, including hanger rollers, upthrust rollers, eccentric rollers, door gibs, fire-rated retainers, interlocks, electrical contacts, pickup devices, door-closing springs, relating devices, bushings, fasteners, and other |

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| associated hardware.<br><br>Inspect, clean, align, secure, and restore the existing tracks to eliminate noise, vibration, binding, and irregular door travel. Replace any track that is excessively worn, damaged, or unsuitable for continued service. |
| 2. Replace final limits, level limits, and selector system. It must have a safety integrity certification (SIL). |
| 3. Replace the inspection box above the cab. It must provide a receptacle and lighting. It must have a safety integrity certification (SIL). It must have a speed sensor device. |
| 4. Replace the car guides rollers. |
| 5. Provide safety switch to emergency hatch. |
| 6. Replacement of travel cables. The traveling cable must be provided to allow the use of cameras inside the cabin, phone line and communication. |
| 7. Replace wiring inside the shaft and cabin. |
| 9. Retain the existing GAL MOVFR door operator serving Elevator No. 1, located on the left-hand side, subject to inspection, testing, adjustment, and verification of compatibility with the new controller.<br><br>Remove the existing Otis door operator serving **Elevator No. 2, located on the right-hand side**, and provide a new high-speed, heavy-duty GAL door operator of the same or current equivalent model as the unit retained on Elevator No. 1.<br><br>The new operator shall automatically open the car and hoistway doors simultaneously when the elevator is properly positioned at the landing and shall close the doors upon expiration of the programmed door-open time. Both door operators shall be adjusted to provide similar operating performance, timing, reliability, and maintenance characteristics. |
| 10. Replacing corridor door interlocks. |
| 11. Provide a new car door restrictor for each elevator, compatible with the existing center-opening door configuration and the new or retained door operator. The restrictor shall prevent opening of the car door outside the unlocking zone and permit emergency opening from the landing side when the car is within the unlocking zone. Detailed requirements are specified in **Part 2 – Products**. |
| 12. Provide standard car top railing on the outside perimeter of the car enclosure top on all sides where a 300 mm (12 in.) ball can pass between the edges of the car enclosure top and the adjacent hoistway enclosure and on sides where there is no hoistway enclosure. |
| 13. Clean shaft, paint over the cabin and the inside of the corridor doors. |
| PIT |
| 1. Remove the existing below-ground direct-acting hydraulic jack assembly and |

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| provide a complete new jack, including the piston, cylinder, seals, protective casing, corrosion protection, piping connections, supports, and all related components required for a complete installation.<br><br>The new jack assembly shall be properly sized for the elevator's rated capacity, travel, and operating conditions and shall comply with the applicable requirements of **ASME A17.1-2019**. Detailed installation, protection, testing, and acceptance requirements are specified in **Part 2 – Products**. |
| 2. Provide an emergency stop button in pit. |
| 3. The modernization of the hydraulic elevator will include the installation of an over-speed valve in the hydraulic line between the power unit and the cylinder, with the aim of enhancing system safety. This valve is designed to detect and respond to an abnormal increase in the downward speed of the car by blocking the flow of hydraulic fluid and stopping the car's movement in the event of a control system failure or significant leak, in accordance with the requirements established by current regulations. |
| 3. Verify the Plunger Stops - Metal stops and/or other means shall be provided at one end of the plunger and at the packing head end of the cylinder to prevent the plunger from traveling beyond the limits of the cylinder. |
| 4. Reconditioning of cabin springs. |
| INSIDE CABIN |
| 1. Replace the car operating panel (COP). Must comply with ADA handicapped law including audible signal, emergency lamp, Phase II fire system, inspection, etc. It must comply with the 2019 Code. The stop switch inside the cab must activate the alarm. A visual signal labeled "EARTHQUAKE MODE" shall be provided on the car push button panel. This may be part of an alphanumeric message display panel. |
| 2. Provide a complete two-way emergency communication system for each elevator, complying with the applicable requirements of **ASME A17.1-2019**. The system shall include an identified Help button, visual call acknowledgment, text-based communication for passengers who cannot hear or speak, and a permanently installed video camera providing a clear view of the car interior.<br>Emergency calls shall be answered by authorized personnel; an automated answering system alone shall not be accepted. Where required based on building height, provide the additional in-building communication means for emergency personnel. Detailed system, monitoring, wiring, display, and testing requirements are specified in **Part 2 – Products**. |
| 3. Provide cabin door reopening system (infrared curtain). This component, when detecting an object, shall reopen the cabin and corridor doors. It shall be out of operation when a reduction of the closing kinetic energy is detected. It must meet the requirements of detecting objects within 18 inches and be able to self-monitor, among other functions. |

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| This component shall comply with ASME A 17.1-2019. |
| 4. **Provide new digital floor position indicators at the existing indicator locations and new car lanterns at each elevator entrance.** The position indicators shall display the current floor location and direction of travel of the elevators. Existing wall openings shall be reused where practical and affected finishes shall be properly repaired as required. |
| 5. **Provide visible and audible signaling through the car lanterns and audio voice system.** The car lanterns shall identify the arriving elevator and direction of travel, while the audio voice system shall announce floors and required operating conditions, including Firefighters' Emergency Operation, earthquake operation, and other special modes. |
| 6. Retain the existing car enclosure and provide new interior decoration in accordance with the final design and finishes selected by the Owner. Replace or modify the front return panels as required to accommodate the new car operating panels, signal fixtures, emergency communication equipment, and door components. Detailed requirements are specified in **Part 2 – Products**. |
| CORRIDOR |
| 1. Provide ASME A 17.1-2019 compliant corridor pushbutton panels - Include a "Do not use elevators in case of fire" sign. This corridor pushbutton panels must include the system that monitors the telephone line (COMMUNICATION FAILURE). In addition, the corridor push-button panel should be provided with a visual signal labeled "ELEVATOR EMERGENCY POWER". This warns that the elevators are operating on emergency floors. The Phase I Fire text should be red on a contrasting background or vice versa. |
| 2. Provide a sign that indicates, "IN CASE OF FIRE DO NOT USE ELEVATORS, USE STAIRS". The same must be engraved on the pushbutton panel. |
| 3. Provide Braille plaque on door frames and elevator identification number. |
| 4. Provide "Access Switches" on end floors. They can be part of the corridor button panel. |
| OTHER |
| 1. Provide electrical drawings and manuals of the unit. |
| 2. Perform acceptance tests. |
| 3. Apply for installation permit from the Department of Labor. |

## 1.5 QUALIFICATIONS

A. Owner's approval is required for proposed manufacturer, suppliers and installers products or services upon submission by the Elevator's Company, accompany of a certificate stating the following:

1. The Elevator Contractor is currently and regularly engaged in the installation of elevator equipment as one of its principal products.
2. The Elevator Contractor shall have ten (10) years of successful experience, trained supervisory personnel, and facilities to install elevator equipment specified herein.
3. The Elevator Contractor shall submit a list of five 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 specifications; include the names and addresses of the building and the names of the administrators.

B. The Elevator Contractor shall provide and install safety devices that have been subjected to tests witnessed and certified by an independent professional testing laboratory that is not a subsidiary of the firm that manufactures supplies or installs the equipment.

## 1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification. The elevator installation shall meet the requirements of the latest editions published and adopted by PROSHA on the date the contract is signed.
B. American Society of Mechanical Engineers (ASME):
A17.1 - Safety Code for Elevators and Escalators - 2019
C. A17.2 - Inspectors Manual for Electric Elevators and Escalators - 2019
D. National Fire Protection Association:
E. .... NFPA 13 - Standard for the Installation of Sprinkler Systems
F. NFPA 70 - National Electrical Code (NEC)
G. .... NFPA 72 - National Fire Alarm and Signaling Code
H. NFPA 101 - Life Safety Code
I. NFPA 252 - Fire Test of Door Assemblies
J. International Building Code (IBC).
K. American Society for Testing and Materials (ASTM):
L. Underwriter's Laboratories (UL)
M. ANSI A-117.1 – Accessible and usable Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped.

1.5 SUBMITTALS

A. Before execution of work, furnish information to evidence full compliance with contract requirements for proposed items. Such information shall include, as required: Manufacturer's Name, Trade Names, Model or Catalog Number, Nameplate Data (size, capacity, and rating) and corresponding specification reference. All submitted drawings and related elevator material shall be forwarded to the Owner.

B. Name of manufacturer, type or style designation, and applicable data of the following equipment shall be provided:

1. Power unit
2. Controller.
3. Rupture valve
4. COP and hall buttons
5. Electric Door Operator; HP, RPM, Voltage, and Ampere rating of motor.
6. Hoistway Door Interlocks.
7. Cab Ventilation Unit; HP rating and CFM rating.
8. Jack and piston

**1.6 WIRING DIAGRAMS AND MANUALS**

A. Provide three complete sets of field wiring and straight-line wiring diagrams showing all electrical circuits of the controller. Maintained one set in the elevator machine room. In the event field modifications are found necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection.

B. Provide the following information relating to the specific type of microprocessor controls installed:

1. Owner's information manual, containing job specific data on major components, maintenance, and adjustment.
2. System logic description.
3. Complete wiring diagrams needed for field troubleshooting, adjustment, repair, and replacement of components. Diagrams shall be base diagrams, containing all changes and additions made to the equipment during the design and construction period.
4. Changes made during the warranty period shall be noted on the drawings in an adequate time to have the finalized drawings reproduced for mounting in the machine room no

later than six months prior to the expiration of the warranty period.

C. Provide written information necessary for proper maintenance and adjustment of the equipment prior to final acceptance as follows:
    1. Lubricating instructions and recommended lubricant grade.
    2. Parts catalogs and maintenance manuals.
    3. Include any special tools, passwords and manuals that are required for maintenance, trouble shooting, adjustments or performance of safety tests for the Owner's use.
    4. If the Company requires the Owner to sign a lease for a special trouble-shooting tool, a copy of the agreement, with all costs associated with its use, shall be submitted with the bid.

## 1.7 WORK SCHEDULE

A. Before starting work submit a detailed work schedule for approval and arrange with owner sequence of procedure, means of access to premises, space for storage, use of approaches, corridors, stairways, elevators, location of temporary partitions, disposal of trash and recyclable materials. No work may begin on any elevator until the materials are available. The availability of storage space should be discussed with the Owner's Representative. The phasing of work on the elevators shall be coordinated with the Owner's Representative.

## 1.8 SAFETY PRECAUTIONS

A. Elevator Contractor Responsibility: The Elevator Contractor shall assume full responsibility and liability for compliance with applicable codes, standards and regulations pertaining to the health and safety of personnel during execution of the Work and shall hold the Government harmless for any action on the Elevator Contractor's part, or that of the Elevator Contractor's employees or sub Elevator Contractors, that results in illness, injury, or death.

B. First Aid and Emergency Response Requirements: The Elevator Contractor shall provide emergency first aid equipment. Additionally, a 110-pound ABC-rated fire extinguisher should be maintained on-site as well as absorbent material of sufficient quantity to collect any spill which might occur during this project.

C. The Elevator Contractor shall provide for site visitors Personal Protective Equipment (PPE) per OSHA for use during their visits.

D. It shall be the obligation of the Elevator Contractor to maintain a free and clear passageway in each elevator lobby. Parts and tools shall be kept within

the confines of entrance partitions. Trash and debris shall be removed daily.

E. The Elevator Contractor shall provide protection, barricades and coverings required by local ordinances, and shall maintain lights and/or signals as a warning during the work; removing the same when completed.

## 1.9 REMOVAL OF MATERIALS AND EQUIPMENT

A. Material and equipment that are not specified to be reused or retained under contract shall be removed daily from the site at the expense of the Elevator Contractor. The Elevator Contractor shall receive title to all material and equipment not specified to be reused as of date of withdrawal from service. Equipment replaced under this specification will become the property of the Elevator Company. The Elevator Company should be responsible for disposing in the correct way the unused equipment from the premises.

## 1.10 PERFORMANCE STANDARDS

A. The elevators shall meet the highest standards of the industry and specifically the following:
   i. Contract speed is average speed in either direction of travel with rated capacity load in the elevator. Speed variation under all load conditions, regardless of direction of travel, shall not vary more than three (3) percent.
   ii. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per ft/s/s and the maximum acceleration and retardation shall not exceed 0.2G per ft/s/s.
   iii. Starting, stopping, and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration.

B. Passenger door operator shall open the car door and hoistway door at 2.5-feet per second and close at 1-foot per second. Freight door operators should open and close at 1 foot per second.

C. Floor level stopping accuracy shall be within 3 mm (.125 in.) above or below the floor, regardless of load condition.

D. Noise and Vibration Isolation: All elevator equipment including their support and fastening to the building, shall be mechanically and electrically isolated from the building structure to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.

E. Sound Isolation: Noise level relating to elevator equipment operation in the machine room shall not exceed 80 db. All dB readings shall be taken three (3) feet off the floor and three (3) feet from the equipment.

F. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 db in elevator lobbies and 60 db inside car under any

condition including door operation and car ventilation exhaust blower on its highest speed.

## 1.11 WARRANTY

A. The One-Year Warranty and 3-month Guarantee Period of Service shall commence and run concurrently after final inspection, completion of performance test, and upon acceptance of each elevator.
B. During the warranty period if a device is not functioning properly in accordance with specification requirements, more maintenance than the contract requires keeping the device operational, the device shall be removed and a new device meeting all requirements shall be installed as part of work until satisfactory operation of installation is obtained. The warranty shall start anew for such parts from the date of completion of each new installation performed, in accordance with the foregoing requirements.

## 1.12 POWER SUPPLY

A. Main Line Fused Disconnect Switch/Shunt Trip Circuit Breaker for each controller shall be located inside the machine room at the strike side of the machine room door and lockable in the “Off” position.
B. Provide Surge Suppressors to protect the elevator equipment.

## 1.13 EMERGENCY POWER SUPPLY

A. Emergency power supply, its starting means, transfer switch for transfer of elevator supply from normal to emergency power, two pairs of conductors in a conduit from an auxiliary contact on the transfer switch (open or close contacts as required by Elevator Controller Manufacturer) to terminals in the group elevator controller and other related work shall be provided by the Electrical Elevator Contractor.
B. Upon loss of normal power supply there shall be a delay before transferring emergency power of 10 seconds minimum to 45 seconds maximum, the delay shall be accomplished through an adjustable timing device.
C. The emergency or standby power system shall be capable of operating the elevator(s) with a rated load, at least one at a time.
D. Prior to the return of normal power an adjustable timed circuit will be activated and that will cause all cars to remain on the floor if already there or stop and remain on the next floor if in flight. The actual transfer of power from emergency power to normal building power shall take place after all cars are stopped on the floor with their doors open.
E. Car lighting circuits shall be connected to the emergency power panel.

## 1.14 ELEVATOR MACHINE ROOM

A. Reuse the existing machine room and meet the requirements of ASME A17.1, NFPA 70, NFPA 101 and IBC. The elevator hydraulic machine and elevator controller shall be in the same code approved machine room.

## 1.15 ELEVATOR SERVICE

A. To discover and resolve conflicts or lack of definition which might create problems, Elevator Company must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structural, electrical, and mechanical provisions for compatibility with the Company's products. The owner will not pay for changes to structural, mechanical, electrical, or other systems required to accommodate the Company's equipment.

B. The Elevator Company shall furnish adequate equipment and use great care in the hoisting and handling of materials and equipment so as not to damage adjacent and existing construction. All damage to the existing building, adjacent structures, walks, drives, and facilities caused by the Company's work shall be repaired by the Company, at no additional cost to the Owner.

## 1.16 ADDITIONAL EQUIPMENT

A. Additional equipment required to operate specified equipment manufactured and contemplated for this installation shall be furnished and installed. The cost of such equipment shall be included in the base bid.

## 1.17 ELEVATOR ELECTRICAL REQUIREMENTS

All electrical equipment placement and installation shall be coordinated with the elevator Company and shall not be located until elevator equipment is installed or coordination has been arranged with the elevator Company's equipment placement.

A. **The following items are part of the Owner responsibilities:**

a. GFI Receptacles**:** GFI receptacles shall be required in all elevator machine rooms, machinery spaces and elevator pit areas. ASME A17.1 NEC, 620.23(C) & 620.24(C).
b. Lighting Required in Elevator Machine Rooms**:** Fluorescent light fixtures should be provided in elevator machine rooms (and machinery spaces when present). Lighting shall be adequate to work on all equipment without shadowing. ASME A17.1.
c. Lighting Required in Elevator Pits**:** Four foot, 2 tubes, guarded fluorescent light fixtures shall be required in all elevator pits. The location shall be determined after coordination with the elevator Company so that the light fixture is located out of the way of all elevator equipment. ASME A17.
d. Bulls Eye (Simplex) Receptacles: Bulls eye (simplex) receptacle for Sump pumps (not – GFI) on a designated circuit, shall be required in all elevator pits, for the elevator pit sump pump. ¾-inch conduit is required to the sump pump. *(ONLY IF THE PIT HAS SUMP PUMP)*
e. Main Line Breaker or Disconnect (lockable, fused or breaker, a listed device): Shall be supplied in all elevator machine rooms in sight of elevator motor and controller and adjacent to machine room entry door, one disconnects required for the elevator. A label on the disconnect is required stating the location of the overcurrent protection device. NEC 620-51.
f. Car Lighting Disconnect**:** A separate branch circuit shall supply the car lights, receptacles(s), auxiliary lighting power source, and ventilation on each elevator car. It shall be fused/breaker and lockable and shall be supplied in all elevator machine rooms. One disconnects required for each elevator. A label stating the location of the supply side overcurrent protection device is required on the disconnect. NEC 620.22(A) & 620.51(D).
g. Light outlet for the elevator, pit and machine room, as indicated by your elevator Company.
h. Smoke Hole: Is required floor elevators of 5 stops or more if the machine room has air conditioning.
i. The door to access to machine room must be fire rated 1 1/2hr labeling.
j. Lighting, convenient GFCI outlets, cooling and ventilation of machine room. Machine room temperature to be maintained between 55° F and 90° F (13° C and 32° C) or between manufacturing specifications. Relative humidity to be maintained at 95% or less non-condensing.
k. It requires all machine room, ABC type fire extinguisher. This will be accessible from the door that provides access to these rooms.

l. Elevator Firefighter's Service is required per ASME A17.1 Rule 2.27.3. Elevator Firefighter's Service wiring and interconnections to automatic sprinkler systems or heat and smoke sensing devices furnished by others.
m. Emergency Phone and Data Line: Conduit shall be provided by electrical Company in all elevator machine rooms to the elevator controller. Electrical Company shall provide electrical conduits for both the emergency elevator phone and required data line to the elevator machine room, to the elevator controller, and terminated on the elevator controller with coordination from the elevator Company.

B. **The following will be the Company's responsibilities:**

a. **Electrical Component NEC Clearances:** Clearances around all electrical equipment in the elevator machine room shall comply with NEC 110-26 electrical clearances requirements. The electrician's work and equipment placement shall be coordinated with the elevator Company's equipment placement. NEC 620.5
b. **Electrical Piping Runs:** All electrical piping runs provided by the electrical Company and elevator Company to the elevator equipment shall be run overhead or in a manner which does not restrict access to and around any equipment.

## 1.18 CONTROL OF SMOKE AND HOT GASES (OWNER RESPONSIBILITIES)

A. When required by the building code, the hoistway shall be provided with means to prevent the accumulation of smoke and hot gases.
B. Where hoistway pressurization is provided, it shall be designed, installed, and maintained so as not to impede elevator operation.

## 1.19 SUBSTANTIAL COMPLETION

A. Elevator Company:

Notify the Owner's Representative in writing that the project, or designated portion thereof, is substantially complete. Upon completion of the preliminary Elevator Consultant punch list, the Elevator Contractor shall submit the following:

i. Operation and maintenance data.
ii. Guarantees and warranties.

iii. Interfacing information.
iv. Keys and Manuals
v. Electrical Drawings.

## 1.20 CORRECTION OF INSTALLED DEFECTIVE WORK

A. As part of the warranty, the Elevator Contractor is responsible for the following: Repair or remove and replace defective installation.

a. Restore damaged substrates and finishes.
b. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and proper adjustment of operating equipment.
c. Restore permanent facilities used during construction to their specified condition.
d. Remove and replace damaged surfaces that are exposed to view if the surfaces cannot be repaired without visible evidence of repair.

## 1.21 CHANGES IN SCOPE AND EXTRA WORK

a. The Owner may at any time make changes to the specifications, omit work, and require additional work to be performed by the Elevator Contractor.
b. Each such addition or deletion to the Contract shall require the Owner and the Elevator Contractor to negotiate a mutually acceptable adjustment to the contract price, and, for the Elevator Contractor to issue a change order describing the nature of the change and the amount of price adjustment.
c. The Elevator Contractor shall make no additions, changes, alterations, or omissions or perform extra work except on written authorization of the Owner.
d. Each change order shall be executed by the Elevator Contractor, Owner, and the Consultant.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURED PRODUCTS

A. Materials, devices, and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. The elevator equipment, including controllers, door operators, and supervisory systems, shall be the product of manufacturers of established reputation, provided such items are capably engineered and produced under coordinated specifications to ensure compatibility with the total operating system.
B. Manufacturers of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit. Components shall be compatible with each other and with the total assembly for the intended service.
C. Mixing of manufactures related to a single system or group of components shall be identified in the submittals.
D. If key operated switches are furnished in conjunction with components of this elevator installation, furnish four (4) keys for each individual switch or lock. Provide different key tumblers for different switch and lock functions. Each key shall have a tag bearing a stamped or etched legend identifying its purpose.
E. Pre-approved Equipment Manufacturers

1. The following manufacturers' equipment and materials have been pre-approved for use on this project.
2. Other equipment not specifically mentioned shall be considered for approval on an individual basis.
3. Certain Original Equipment Manufacturers' equipment is acceptable unless otherwise specified.

    a. Controller –Elevator Controls, Alpha Elevator, GAL Elevator, Smartrise or approved equal.
    b. Hangers, Interlocks and Door Operators - G.A.L.or approved equal.
    c. Fixtures (Car Operating Panel, Hall Push Button) Vandal Resistant MAD, PTL, or approved equal.
    d. Door Protective Device: ICU/Gatekeeper 2000 from Adams Elevator Equipment Company, Juans Model 3D.
    e. Hydraulic Machine –Minesota, Vantage or approved equal
    f. Electrical Traveling Cables - Draka, James Monroe

g. Guide Shoes– ELSCO or approved equal
h. Intercommunications/Telephones - RATH, Three King, Janus, approved equal.

4. Original Equipment Manufacturers may substitute their own branded equipment subject to the following:

   a. All requirements of the specifications are met regarding performance, appearance, serviceability, and support.
   b. A full stock of all regular and critical replacement parts required for this project are maintained at a facility near the project site. Any parts not stocked at the above-mentioned facility shall be identified with the location of the nearest source and shall be available for next-day delivery upon demand.
   c. All parts and software shall be made available for purchase by a qualified elevator maintenance firm with one-business day delivery without direct Owner involvement.
   d. All specialized tools, equipment, software, and passwords required to maintain, repair, adjust the operation, and perform code mandated inspections are provided to the Owner as part of the base installation.
   e. Technical support for the product(s) should be available to the Owner's elevator service provider.

## 2.2 CONDUIT AND WIREWAY

A. Reuse existing ones where possible and provide new conduit and wireway where needed. Install electrical conductors, except traveling cable connected to the elevator, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Rigid conduit smaller than .75 inch or electrical metallic tubing smaller than .50-inch electrical trade size shall not be used. All raceways completely embedded in concrete slabs, walls, or floor fill shall be rigid steel conduit. Wireway (duct) shall be installed in the hoistway and to the controller and between similar apparatus in the elevator machine room. Fully protects self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than .375-inch electrical trade size may be used, not exceeding 18 inches in length unsupported, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC.

B. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. Install a steel lock nut under the bushings if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.
C. Rigid conduct and EMT fittings using set screws or indentations as a means of attachment shall not be used.
D. Connect motor or other items subject to movement, vibration, or removal to the conduct or EMT systems with flexible, steel conduits.

## 2.3 CONDUCTORS

A. Remove existing and provide new conductors, excluding the traveling cables. Conductors shall be stranded or solid coated annealed copper. Multiple conductor cables shall have color or number coding for each conductor. Conductors for control boards shall be in accordance with NEC. Tap connectors may be used on wireways provided they meet all UL requirements.
B. Provide all conduct and wiring between machine room, hoistway and fixtures.
C. All wiring must test free from short circuits or ground faults. Insulation resistance between individual external conductors and between conductors and ground shall be a minimum of one megohm.
D. Where the size of conductor is not given, voltage and amperes shall not exceed limits set by NEC.
E. Provide grounding equipment. Ground the conduits, supports, controller enclosure, motor, platform and car frame, and all other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, green insulated and sized as required by NEC. Bond the grounding wires to all junction boxes, cabinets, and wire raceways.

## 2.4 TRAVELING CABLES

A. Remove existing and provide new flexible traveling cables conforming to the requirements of NEC. Traveling cables shall run from the junction box on the car directly to the controller. Junction boxes on the car shall be equipped with terminal blocks. Cables shall be securely anchored to avoid strain on individual terminal connections. Flame and moisture resistant outer covering must remain intact between junction boxes. Abrupt bending, twisting and distortion of the cables shall not be permitted.
B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 5 spare conductors on each traveling cable.

C. Provide shielded wires for the auto dial telephone system within the traveling cable, five (5) pair shielded wires for card readers, one (1) RG-6 Ethernet cable for Wi-FI, two (2) pair 14-gauge wires for 110 Volt power supply, camara and wire for video display monitor if specified.
D. If traveling cables contact the hoistway or elevator due to sway or change in position, provide shields or pads to the elevator and hoistway to prevent damage to the traveling cables.
E. Hardware cloth may be installed from the hoistway suspension point to the elevator pit to prevent traveling cables from rubbing or chafing and securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flat wall.

## 2.5 PROGRAMMABLE CONTROLLERS FOR HYDRAULIC ELEVATOR

A. Remove existing and provide new UL/CSA Labeled Controller. Mount all assemblies, power supplies, chassis switches, and relays on a steel frame in a NEMA Type 1 General Purpose Enclosure.
B. Properly identify each device on all panels by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors to controller and supervisory panel shall be neatly formed, laced, and identified.

C. Controller Description:
1. The elevator controller shall utilize a microprocessor-based logic system and shall comply with ASME 17.1-2019 safety code for elevators and escalators. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices and shall have permanent indicators to indicate important elevator status as an integral part of the controller. **The elevator control equipment shall be provided such that at least three (3) elevator service companies can maintain the equipment**. The controller shall be provided with the capability of in-the field changes for certain variables such as door time. These changes should be stored permanently using non-volatile memory. Thus, if the power to the unit is disconnected, the system will maintain the programmed variables.
2. Failure of any single magnetically operated switch, conductors, or relay to release in the intended manner; or the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is UNLOCKED or if any hoistway door or car door or gate contact is not in the position. Furthermore, while on car top inspection

or hoistway access operation, failure of any single magnetically operated switch, conductors or relay to release in the intended manner; or the occurrence of a single accidental ground shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

3. The controller should be designed in such a way that it recognizes the proper function when a door monitor failure occurs, low oil level, shutdown devices, among others.
4. Provide a motor limit timer function which in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close them and the elevator shall then be rendered unresponsive to any automatic operation car door open pushbutton shall remain operational. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.
5. Provide a valve limit timer function which in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close them and the elevator will then be rendered unresponsive to any automatic operation car door open push button shall remain operational. Operation may be restored by cycling to power disconnect switch or putting the car on access or inspection operation.
6. Low Oil Control:
    - A low oil control feature shall protect the hydraulic components if the elevator fails to complete its upward journey in the normal time.
    - Actuation of the low oil control circuit shall stop the pump and lower the car to the lowest landing. Power-operated doors should open to permit passengers to depart and should then close. The car door open push button shall remain operational. The car shall remain parked at that landing completely removed from demands for service.
    - To return the car to normal service, the malfunction shall be corrected and the elevator controls reset in the machine room.
7. Provide an out-of-service timer (T.O.S.) which will automatically take the car out of service if the car is delayed in

leaving the landing while there are calls existing in the building. The car shall not respond to hall calls while in this mode of operation.

8. Provide door protection timers for both the open and close directions which will help protect the door motor and which will help prevent the car from getting stuck at a landing. The door-opening protection timer shall cease attempting to open the door after a predetermined time if the door is prevented from reaching the open position. The door-closing protection timer will reopen the doors for a short time if the door-closing attempt fails to close the door locks after predetermined time.
9. Phase Protection: Provide 3-phase power monitor for elevator power supply, which monitors phase loss, low voltage, phase reversal, phase unbalance, and has manual and automatic reset. Level in manual position.
10. Elevator controller is to be factory equipped with provisions for emergency power connections.
11. **Duplex Selective Collective Operation -** The two elevators shall operate as a coordinated duplex selective collective automatic passenger elevator system. The controllers shall register car calls and hall calls and assign each hall call to the most appropriate elevator based on car location, direction of travel, existing calls, operating status, and estimated response time.

    Each elevator shall respond to calls in the proper direction of travel while the duplex system minimizes unnecessary travel, duplicate responses, and passenger waiting time. If one elevator is removed from service, placed on independent service, inspection operation, Firefighters' Emergency Operation, or otherwise becomes unavailable, the remaining elevator shall automatically continue to serve applicable hall calls as a single-car selective collective system.

12. **Automatic Operation of Car Lighting -** Automatic operation of the car lighting shall be provided in accordance with the applicable requirements of **ASME A17.1-2019**. The feature shall allow the car lights to be automatically turned off when all of the following conditions exist for not less than five (5) minutes:

    a. The car is stopped at a landing.
    b. The doors are closed.
    c. There is no demand for service.

d. The elevator is in automatic operation.

Interruption of any of these conditions shall cause the car lights to automatically turn on. The automatic car lighting feature shall be capable of being enabled or disabled as desired by the Owner through the elevator controller or approved control setting.

13. **Controller Code Compliance -** The elevator controller shall perform all operating, control, monitoring, safety, and diagnostic functions required for a simplex hydraulic passenger elevator in accordance with **ASME A17.1-2019**, applicable hydraulic elevator requirements, alteration requirements, NEC, and all requirements of the Authority Having Jurisdiction.

## 2.6 OIL-HYDRAULIC POWER UNIT

### A. General

The Elevator Contractor shall furnish and install one new hydraulic power unit for each of the two (2) hydraulic passenger elevators at the **Arecibo Judicial Center**. Each power unit shall be designed for an elevator rated capacity of **3,500 lb**, a rated speed of **150 ft/min**, the actual travel and number of stops, the new direct-acting below-ground hydraulic jack assembly, the existing electrical service, the duplex control system, and the available machine-room conditions.

### B. Power Unit Construction

Each hydraulic power unit shall be furnished as a complete manufacturer-coordinated assembly and shall include:

1. Properly sized oil reservoir.
2. Submersible pump and motor assembly.
3. Hydraulic control valve.
4. Muffler or silencer, where required.
5. Pressure gauge.
6. Pressure-relief valve.
7. Oil-level indicator.
8. Oil-temperature monitoring and protection.
9. Shutoff valves.
10. Isolation couplings and vibration-isolation pads.
11. Electrical protective devices.
12. All piping connections, fittings, supports, guards, and accessories required for complete operation.

A non-submersible arrangement may be proposed only when the Elevator Contractor demonstrates in writing that it is better suited to the existing installation and limited machine-room layout. The proposed arrangement shall be approved before the equipment is released for manufacture.

### C. Hydraulic Calculations and Submittals

Submit complete manufacturer's data and calculations for each hydraulic power unit, including:

1. Motor horsepower.
2. Pump capacity and operating pressure.
3. Valve manufacturer and model.
4. Reservoir capacity.
5. Hydraulic-oil requirements.
6. Electrical characteristics.
7. Heat generation and oil-temperature considerations.
8. Overall equipment dimensions.
9. Sound- and vibration-control provisions.
10. Required machine-room clearances.
11. Compatibility with the new controller and hydraulic jack.
    The submittal shall demonstrate that both power units can be installed within the existing machine room while maintaining the required electrical working clearances, service access, ventilation, inspection access, and safe circulation.

### D. Pump

Provide a positive-displacement screw-type pump selected for smooth, quiet, and reliable elevator operation.
The pump shall be properly sized for the rated load, speed, travel, system pressure, motor, control valve, and new hydraulic jack assembly. Where a submersible power unit is provided, the pump and motor shall be designed by the manufacturer for operation within the hydraulic-oil reservoir.

### E. Motor

Provide a premium-efficiency motor specifically rated for hydraulic elevator service and compatible with the proposed controller, pump, electrical service, and starting method.
The motor shall have the required horsepower, torque, duty rating, insulation class, overload protection, and temperature protection for repeated elevator operation at the

specified load and speed.

### F. Hydraulic Control Valve

Provide an electrically actuated and hydraulically operated control-valve assembly designed for smooth acceleration, deceleration, leveling, stopping, and load-independent performance. All principal adjustments shall be readily accessible without removing the valve assembly from the hydraulic piping. The valve assembly shall include:

1. Controlled bypass for smooth starting and stopping in the up direction.
2. Adjustable up-leveling speed.
3. Adjustable lowering and down-leveling speeds.
4. Automatic closing upon loss of electrical power.
5. Safety check valve to hold the car when the pump is not operating.
6. Pressure-relief valve capable of bypassing the full pump output.
7. Manual lowering valve.
8. Required solenoids, filters, pressure ports, and related accessories.
   The pressure-relief valve shall limit system pressure in accordance with the applicable code and manufacturer's requirements.
   Provide a permanently installed, liquid-filled pressure gauge located at or adjacent to the control-valve assembly.

### G. Oil Reservoir

Provide an oil reservoir of sufficient capacity to accommodate the full displacement required for elevator travel, plus an adequate operating reserve. The reservoir shall include:

1. Drain connection.
2. Removable cover.
3. Oil-level indicator.
4. Protected venting.
5. Pump suction strainer.
6. Means of isolating the oil for servicing the pump and valves.
7. Internal arrangement that minimizes aeration, turbulence, foaming, and heat buildup. The vent system shall prevent the entry of liquids, dirt, and debris and shall be protected against accidental blockage or tank deformation during elevator operation.

## H. Hydraulic Oil

Provide the quantity and type of hydraulic oil recommended by the power-unit, valve, pump, and jack manufacturers.
The oil shall have the proper viscosity, lubricating qualities, oxidation resistance, anti-foaming properties, and fire-safety characteristics for the operating conditions. The hydraulic oil shall have a flash point greater than **400°F**, unless a higher value is recommended by the equipment manufacturer.

## I. Noise and Vibration Reduction

Select and install the complete hydraulic system to minimize airborne and structure-borne noise. Provide:

1. Blowout-resistant hydraulic muffler or pulsation suppressor in the oil line, where recommended.
2. Rubber or elastomeric vibration-isolation pads beneath the power unit.
3. Isolation couplings in the hydraulic piping.
4. Flexible connections or other manufacturer-approved vibration-control provisions.
5. Sound-attenuating enclosure panels where required to control pump and motor noise.
   Sound-control components shall not obstruct ventilation, inspection, adjustment, or maintenance access.

## J. Hydraulic Supply Piping

Provide new hydraulic supply piping as required to connect each new power unit to its corresponding hydraulic jack assembly. Hydraulic piping shall be a minimum of Schedule 40 black steel pipe or another material specifically permitted for the application. The complete system shall be properly sized, supported, aligned, protected, and free from leakage or seepage at all joints. Verify the condition and routing of any existing piping proposed for retention. Replace all piping that is corroded, damaged, improperly supported, contaminated, undersized, or unsuitable for the new installation.

## K. Shutoff Valves

Provide two manually operated shutoff valves for each elevator:

1. One valve in the machine room near the hydraulic power unit.

2. One valve in the pit near the hydraulic jack assembly.
   The valves shall permit the jack and cylinder assembly to be isolated from the hydraulic power unit for inspection, servicing, testing, or emergency purposes.
   Each valve shall be readily accessible, permanently identified, suitable for the system pressure, and capable of being secured in the required operating position.

**L. Oil Strainer**

Provide a high-pressure oil strainer in the return line between the hydraulic jack and control-valve assembly to protect the valve system during downward operation. The strainer shall include:

1. A screen suitable for removing solid contaminants.
2. A magnetic drain plug or equivalent means for collecting ferrous material.
3. A housing rated for the maximum hydraulic-system pressure.
4. Accessible provisions for inspection, cleaning, and servicing.
   A nominal 40-mesh screen may be provided unless the valve manufacturer requires another filtration rating.

**M. Isolation Couplings**

Provide hydraulic isolation couplings in the oil-delivery piping to reduce transmission of pump and motor vibration into the piping, jack assembly, hoistway, and building structure. The number, type, size, pressure rating, and location of the isolation couplings shall be determined by the Elevator Contractor and coordinated with the hydraulic-equipment manufacturer.

**N. Manual Lowering Valve**

Provide a manually operated lowering valve located on or adjacent to the hydraulic control-valve assembly. The valve shall permit controlled lowering of the elevator during a loss of normal power or other emergency condition. Lowering speed shall not exceed **20 ft/min**. The valve shall be readily accessible and permanently identified with its function and direction of operation.

**O. Anticreep and Automatic Releveling Operation**

Provide each elevator with automatic anticreep and releveling operation. The system shall automatically correct a change in car-floor level caused by hydraulic leakage, oil-temperature changes, load changes, or normal settling. Releveling shall occur at

reduced speed and only within the permitted leveling zone. The operation shall be coordinated with the controller, hydraulic valve, door-locking circuits, door operator, and required safety devices.

## 2.7 FIREFIGHTER'S SERVICE

### A. General

Provide complete Firefighters' Emergency Operation for both elevators, including Phase I Emergency Recall Operation and Phase II In-Car Emergency Operation, in accordance with the applicable requirements of ASME A17.1-2019 and the Authority Having Jurisdiction.

1. **Designated Recall Floor: _____**
2. **Alternate Recall Floor: _____**
3. The designated and alternate recall floors shall be confirmed with the Owner before the controllers and operating fixtures are released for fabrication.

### B. Smoke Detection and Fire Alarm Interface

New smoke detectors required to initiate Phase I Emergency Recall Operation shall be furnished and installed by others as part of the Owner's fire alarm system work. Detectors shall be provided in the elevator lobbies, machine room, and other required elevator-related areas. The Elevator Contractor shall provide all required controller inputs, terminals, relays, programming, interfaces, and coordination necessary for proper operation of the elevators upon receipt of the fire alarm signals.

1. Smoke detectors located in a common elevator lobby shall initiate recall of both elevators serving that lobby.
2. Elevators or elevator groups serving separate or isolated areas of the same floor shall be provided with independent initiating circuits, where applicable.
3. Smoke detectors located in the machine room shall initiate Phase I Emergency Recall Operation for both elevators having equipment located in that room.
4. Activation of the smoke detector at the designated recall floor shall cause the elevators to recall to the alternate recall floor.
5. Activation of smoke detectors at other elevator lobbies or in the machine room shall cause the elevators to recall to the designated recall floor.

### C. Recall During Hydraulic Protective or Auxiliary Operation

If Phase I Emergency Recall Operation is initiated while an elevator is operating in response to any of the following conditions, the elevator shall discontinue the applicable

operation and proceed to the designated or alternate recall floor, provided the car is capable of movement:

1. Low-oil protection.
2. Plunger-follower guide protection.
3. Auxiliary-power lowering.
4. Oil-tank overtemperature shutdown or protection.
5. Other hydraulic protective operation affecting normal service.

If the elevator is unable to reach the required recall floor, the car shall descend to the nearest available landing where it can safely stop. Upon arrival, the power-operated doors shall open and remain in the condition required by the applicable Firefighters' Emergency Operation sequence.

**D. Coordination and Testing**

The Elevator Contractor shall coordinate the complete sequence of operation with the fire alarm contractor, electrical contractor, Owner, and Elevator Consultant.

Integrated testing shall verify:

1. Recall to the designated floor.
2. Recall to the alternate floor.
3. Machine-room recall operation.
4. Proper response during hydraulic protective and auxiliary lowering operations.
5. Phase II in-car operation.
6. Door operation, visual indicators, audible signals, and restoration to normal service.

## 2.8 INDEPENDENT SERVICE

A. Provide an INDEPENDENT SERVICE key switch on the face of the main car operating panel that shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch buttons and shall bypass all calls registered on landing push buttons. The car should start when a car call is registered, car call button or door close button is pressed, car and hoistway doors are closed, and interlock circuits are made. When the switch is returned to the "OFF" position, normal service shall be resumed.

## 2.9 LOAD BYPASS OPERATION

Provide load bypass operation for each elevator as part of the duplex control system. When the car load reaches an adjustable preset threshold, the affected elevator shall bypass, but not cancel, registered hall calls and shall respond only to car calls until the load is reduced below the programmed value.

The feature shall be coordinated with the load-weighing device, rated capacity of **3,500 lb**, duplex dispatching logic, and controller manufacturer's requirements.

## 2.10 ANTI-NUISANCE FEATURE

A. If the weight in the car is not commensurate with the number of registered car calls, cancel car calls. Systems that employ either load weighing or door protective device for activation of this feature are acceptable.

## 2.11 SEISMIC REQUIREMENTS

A. The modernization work shall comply with the alteration requirements applicable to the components being replaced or modified.
B. A seismic detection device and earthquake emergency operation are not included as part of the base scope of work unless specifically required by the Authority Having Jurisdiction or by the building code determined to be applicable to this alteration.
C. If seismic provisions are determined to be applicable, the Elevator Contractor shall identify the additional equipment, controls, supports, restraints, interfaces, testing, cost, and schedule impact required before proceeding with such work.
D. Regardless of whether a seismic detection device is required, all new hydraulic power units, controllers, tanks, piping, supervisory panels, and related equipment shall be securely supported and fastened in accordance with the applicable elevator, electrical, and manufacturer's installation requirements.

## 2.12 CAR SPRINGS

A. Recondition springs for each car. Securely fasten and support the pit channels and align with striker plates on car and counterweight.

## 2.13 HYDRAULIC JACK AND PLUNGER ASSEMBLY

### A. Complete Replacement

As part of the modernization, the Elevator Contractor shall completely remove and replace the existing direct-acting, below-ground hydraulic jack assembly serving each elevator.

The replacement work shall include a new plunger, cylinder, packing gland, seals, wipers, gaskets, O-rings, protective casing, corrosion-protection system, piping

connections, supports, fasteners, and all related components necessary for a complete, safe, reliable, and code-compliant installation.

## B. Design Requirements

Each new hydraulic jack assembly shall be specifically designed and sized for the elevator's rated capacity of **3,500 lb**, rated speed of **150 ft/min**, actual travel, platform and car weight, operating pressure, pit conditions, and existing hoistway configuration.

The new jack shall be compatible with the proposed hydraulic power unit, control valve, piping system, controller, and automatic releveling operation.

## C. Below-Ground Cylinder Protection

Because the hydraulic cylinders will be installed below ground, each new cylinder shall be provided with the corrosion protection and protective containment required by the applicable provisions of ASME A17.1-2019.

Provide a protective casing or liner that isolates the cylinder from direct contact with the surrounding soil and groundwater and permits monitoring or detection of hydraulic-fluid leakage, where required.

The protective system shall be installed continuously around the below-ground portion of the cylinder and shall not be damaged during installation.

## D. Existing Jack Removal and Borehole Conditions

Remove the existing plunger, cylinder, packing assembly, and related components from the borehole. The Elevator Contractor shall inspect and verify the condition, depth, alignment, diameter, and accessibility of the existing borehole before manufacturing or installing the new jack.

Provide all excavation, drilling, cleaning, pumping, casing, alignment work, dewatering, seals, supports, backfilling, grouting, and restoration required to accommodate the new jack assembly. Any obstruction, collapsed casing, groundwater infiltration, misalignment, insufficient depth, or other condition affecting installation shall be documented and reported before proceeding.

## E. Plunger and Cylinder Construction

The new plunger shall have a smooth and accurately finished surface free from scratches, scoring, pitting, corrosion, porosity, deformation, weld defects, or other imperfections that could affect sealing, leveling, ride quality, or reliable operation.
The cylinder and plunger shall be properly aligned to prevent binding, uneven seal wear, side loading, vibration, or abnormal movement throughout the full travel of the elevator.

## F. Packing and Sealing System

Provide a complete new packing and sealing system compatible with the jack assembly, hydraulic fluid, operating pressure, temperature range, and manufacturer's requirements.
The sealing system shall provide reliable, leak-free operation and shall include all required packing materials, wipers, gaskets, O-rings, retaining devices, drainage provisions, and related hardware.

## G. Hydraulic Connections and Shutoff Valve

Provide all new piping connections, fittings, seals, supports, and isolation components required to connect the jack assembly to the hydraulic system.
Provide a manually operated shutoff valve in the pit near each jack assembly, as specified elsewhere, to permit isolation of the jack from the hydraulic power unit.

## H. Installation and Alignment

Install the new jack assembly in accordance with the jack manufacturer's written instructions.
The assembly shall be properly centered, plumbed, aligned, supported, and secured. The installation shall not impose lateral loads or abnormal stresses on the plunger, cylinder, car frame, platform, guide system, or hydraulic piping.

## I. Testing

Upon completion, test each hydraulic jack assembly for:

1. Hydraulic-fluid leakage.
2. Pressure stability.
3. Smooth movement throughout the full travel.
4. Proper leveling and releveling.

5. Acceptable ride quality.
6. Correct alignment.
7. Proper operation at rated load.
8. Absence of binding, vibration, jerking, drifting, or abnormal noise.
9. Proper operation of the protective casing and leakage-monitoring provisions, where provided.

All deficiencies shall be corrected before Final Acceptance.

## 2.14 HYDRAULIC OVERSPEED VALVE - PROTECTION AGAINST UNCONTROLLED DOWNWARD MOVEMENT

A. As part of the modernization of the existing direct-acting hydraulic passenger elevator, the Elevator Contractor shall furnish and install a new hydraulic overspeed valve in the pressure piping serving the hydraulic jack.
B. The overspeed valve shall be installed in the pressure piping as close as practicable to the hydraulic jack and, for a single-jack arrangement, shall be located within 300 mm (12 inches) of the hydraulic jack, in accordance with ASME A17.1-2019, Section 3.19.4.7.3.
C. The overspeed valve shall conform to ASME A17.1-2019, Section 3.19.4.7, including applicable requirements for engineering testing, permanent marking, installation, pressure piping and fittings, performance, field sealing, inspection, and testing. ASME requires each type or model of overspeed valve to be engineering tested, and the valve must be permanently marked with manufacturer identification, type designation, component rated pressure, and rated flow range.
D. Acceptable manufacturers shall include EECO, Maxton, or approved equal, provided the proposed valve is specifically suitable for hydraulic elevator service, rated for the elevator’s working pressure and flow, and compatible with the existing hydraulic jack, hydraulic power unit, control valve, pressure piping, rated load, rated speed, travel, and operating conditions.
E. The overspeed valve shall be selected, installed, adjusted, sealed, and tested so that it will stop the elevator car traveling in the down direction with rated load within the limits required by ASME A17.1-2019. The Code requires the valve tripping speed to be not less than 110% and not greater than 140% of the elevator operating speed in the down direction, and in no case more than 60 FPM above rated speed; it also establishes deceleration performance limits.
F. The Elevator Contractor shall verify the existing hydraulic piping arrangement, jack type, pipe size, flow rate, working pressure, rated speed, and available installation space before ordering or installing the overspeed valve. Any required

pipe modifications, fittings, supports, unions, shutoff provisions, or access provisions necessary for proper installation, inspection, testing, and future maintenance shall be included.

G. Pressure piping, fittings, mufflers, valves, and related hydraulic components shall be properly rated for the elevator's working pressure and shall comply with ASME A17.1-2019 Section 3.19 requirements. Existing piping shall not be reused unless verified to be properly rated, supported, free of corrosion, free of leakage, and suitable for continued hydraulic elevator service.

J. The Elevator Contractor shall provide a written overspeed valve test procedure from the valve manufacturer or installer and shall perform the required acceptance test. The overspeed valve shall be inspected and tested to verify that it will stop the car traveling down with rated load within the applicable ASME A17.1-2019 limits. Test results shall be recorded and submitted as part of the closeout documentation.

K. The overspeed valve installation shall not create unsafe piping stresses, inaccessible test conditions, maintenance conflicts, reduced serviceability, interference with the hydraulic jack, or non-compliant hydraulic system conditions. The completed installation shall be accessible for inspection, adjustment, sealing, testing, and future maintenance.

L. The Elevator Contractor shall include all labor, materials, engineering, pipe modifications, fittings, supports, testing, adjustment, documentation, and coordination required to provide a complete and code-compliant overspeed valve installation.

## 2.15 GUIDE RAILS, SUPPORTS, AND FASTENINGS

A. Retain existing car guide rails and brackets.

B. Thoroughly clean all guide rails of dust, grease, oil, rust, and other foreign substances. File and remove all rough edges and surfaces and tighten bracket bolts and guide clips for smooth and quiet operation of car.

C. Elevator Contractor may provide new roller guide assemblies, of equal or greater quality, in lieu of rebuilding the existing, as part of the base bid subject to the approval of the Consultant. Costs associated with replacement shall also be included in the base bid cost.

## 2.16 NORMAL AND FINAL TERMINAL STOPPING DEVICES

A. Terminal Slowdown and Normal Stopping Devices

Provide new terminal slowdown and directional stopping devices for each elevator. Install the devices on the car or within the hoistway, as appropriate,

to initiate controlled deceleration, reduce the elevator speed, and bring the car to a normal automatic stop at the terminal landings.

1. The devices shall operate reliably under all normal operating conditions and with loads up to and including 125 percent of the rated capacity.
2. Operation of a directional stopping device shall prevent continued movement in the affected direction while permitting movement in the reverse direction when otherwise safe and permitted by the control system.
3. The devices shall be securely mounted, properly aligned, protected from accidental damage, and coordinated with the controller, hydraulic power unit, control valve, leveling system, and position-detection system.

B. Final Terminal Stopping Devices

Provide new final terminal stopping devices in the hoistway, independent of the normal terminal stopping and slowdown devices. The devices shall be positively opened if the car travels beyond the normal terminal stopping position.

1. Operation of a final terminal stopping device shall remove power from the hydraulic pump motor and the applicable control-valve circuits to stop further movement in the affected direction.
2. The devices shall prevent continued operation beyond the terminal landing while permitting only the movement or recovery operation allowed by the applicable code and approved control sequence.
3. Final terminal stopping devices shall be manually reset where required and shall not automatically return the elevator to normal operation without correction and verification of the condition that caused their activation.

## 2.17 CROSSHEAD DATA PLATE AND CODE DATA PLATE

A. Permanently attach a non-corrosive metal Data Plate to car crosshead.
B. Permanently attach a non-corrosive Code Data Plate to the controller.

## 2.18 WORKMAN'S LIGHTS AND OUTLETS

A. Provide new duplex GFCI protected type receptacles and lamps with guards on top of each elevator car. The receptacles shall be in accordance with NEC, rated as 15 amperes and 125 volts.

## 2.19 CARTOP OPERATING DEVICE

A. Provide a new cartop operating device.
B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked "INSPECTION" and "NORMAL" on the faceplate, with 6 mm (.25 in.) letters.
C. Movement of the elevator shall be accomplished by continuous pressure on the direction button and a safety button.
D. Provide an emergency stop switch, push to stop/pull to run.
E. Provide permanent identification for the operation of all components in the device.
F. The device shall be permanently attached to the elevator crosshead on the side of the elevator nearest to the hoistway doors used for accessing the top of the car.

## 2.20 CAR LEVELING DEVICE

A. Car shall be equipped with a new two-way leveling device to automatically bring the car to within 3 mm (.125 in.) of exact level with the landing for which a stop is initiated regardless of load in car or direction.
B. If the car stops short or travels beyond the floor, the leveling device within its zone shall automatically correct this condition and maintain the car within 3 mm (.125 in.) of level with the floor landing regardless of the load carried.

## 2.21 EMERGENCY STOP SWITCHES

A. Provide an emergency stop switch, push to stop/pull to run, for the top-of-car device, pit, machine space, service panel and firefighter control panel inside the elevator. Mount stop switches in the pit adjacent to pit access door, at top of the pit ladder 1220 mm (48 in.) above the bottom landing sill and 1220 mm (48 in.) above the pit floor adjacent to the pit ladder.
B. Each stop switch shall be red in color and shall have "STOP" and "RUN" positions legibly and indelibly identified.

## 2.22 MAIN CAR OPERATING PANEL

A. Provide a new main car operating panel in the car enclosure on the front return panel for passenger elevators. The top floor car call push button shall not be more than 1220 mm (48 in.) above the finished floor. Car call push buttons and indicator lights shall be LED illuminated, round with a minimum diameter of 25 mm (1 in.). Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered.

B. One-piece tilt panel shall have the firefighter's service panel recessed into the upper section and the service operation panel recessed into the lower section fitted with hinged doors. Doors shall have concealed hinges, be in the same front plane as the faceplate and fitted with key operated locks. Secure the faceplate with stainless steel tamperproof screws.
C. All terminology and tactile symbols on the faceplate shall be on square or rectangular plates recessed into the faceplate with its surface flush with the surface of the faceplate. Use 6 mm (.25 in.) letters to identify all devices in the faceplate. The tactile symbols with contrasting background shall be 12.5 mm (0.5 in.) high raised .075 mm (.030 in.) on the plate. Surface mounted plates are not acceptable.
D. The upper section shall contain the following items in order listed from top to bottom:
    1. Elevator number, 12.5 mm (.50 in.) high with black paint for contrast.
    2. Capacity plate information with black paint contrasting the freight loading class and the number of passengers allowed.
    3. LED illuminated digital car position indicator with direction arrows.
    4. Emergency car lighting system consisting of a rechargeable battery, charger, controls, and LED illuminated light fixture. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall maintain a minimum illumination of 1.0 foot-candle when measured 1200 mm (48 in.) above the car floor and approximately 300 mm (12 in.) in front of the car operating panel, for not less than four (4) hours.
    5. Firefighter's Emergency Operation Panel shall be 167.6 mm (66 in.) minimum to 1830 mm (72 in.) maximum to the top of the panel above finished floor.
    6. Firefighter's Emergency Indicator Light shall be round with a minimum diameter of 25 mm (1 in.).
    7. Key operated Independent Service Switch or toggle switch inside service panel.
    8. Provide a Door Hold Button on the faceplate next to the Independent Service Key Switch. It shall have "DOOR HOLD" indelibly marked on the button. Button light when activated. When activated, the door shall stay open for a maximum of one minute. To override the hold timer, push the car call button or door close button.
    9. Complete set of round car call push buttons, minimum diameter of 25 mm (1 in.), and LED white light illuminated, corresponding to the floors served. Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 12.5 mm (.50 in.) high in the face of the call button.

10. Door Open and Door Close buttons shall be located below the car call buttons. They shall have “OPEN” and “CLOSE” legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door jamb.
11. Red Emergency Alarm button that shall be located below the car operating buttons. Mount the emergency alarm button not lower than 888 mm (35 in.) above the finished floor. It shall be connected to audible signaling devices. Provide audible signaling devices including the necessary wiring.
12. Emergency Help push button shall activate two-way communications by Auto Dial telephone system that is compatible with the Recuse Entity telephone system. The help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button “HELP” in the face of the button with 12.5 mm (.50 in.) high letters.

E. The service operation panel in the lower section shall contain the following items:
   1. Light switch labeled “LIGHTS” for controlling interior car lighting with its two positions marked “ON” and “OFF”.
   2. Inspection switch that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled “ACCESS ENABLE” with its two positions marked “ON” and “OFF”.
   3. Three position switch labeled “FAN” with its positions marked “HIGH”, “LOW” and “OFF” for controlling car ventilating blower.
   4. Two-position Spring return toggle switch or push button to test the emergency light and alarm device. It shall be labeled “TEST EMERGENCY LIGHT AND ALARM”.
   5. Two-position toggle switch labeled “Independent Service” with its positions marked “ON” and “OFF”.
   5. Two-position emergency stop switch, when operated, shall interrupt power supply, and stop the elevator independently of regular operating devices. Emergency stop switch shall be marked “PUSH TO STOP” and “PULL TO RUN”.

## 2.23 AUDIO VOICE SYSTEM

A. Provide a digitized audio voice system. Audio voice shall announce floor designations, direction of travel, and special announcements. The voice announcement system shall be a natural sounding human voice that receives messages and shall comply with ADA requirements for audible car position indicators. The voice announcer shall have two separate volume controls, one for the floor designations and direction of travel, and another for special announcements. The voice announcer shall have a full range loudspeaker, located on top of the cab. The audio voice unit shall contain the number of ports

necessary to accommodate the number of floors, direction messages, and special announcements. Install voice announcer per manufacturer's recommendations and instructions. The voice system shall be the product of a manufacturer of established reputation. Provide manufacturer literature and a list of voice messages.

1. Fire Service Message.
2. "Please do not block doors".
3. Seismic Operation.
4. Others

## 2.24 CAR EMERGENCY SIGNALING DEVICES

A. Furnish and install a complete ADA compliant auto dial telephone.

B. Provide a two-way communication device in the car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with two numbers.

A means of communication shall be provided in or adjacent to a car operating panel. **The push button shall be visible and permanently** identified with the "PHONE" symbol (see 2.26.12.1). The identification shall be on or adjacent to the phone push button. The communications mean shall be initiated when the push button is actuated.

C. On the same panel as the phone a message shall be displayed push button that is activated by authorized personnel to acknowledge that communications are established. The message shall be extinguished permitted to be where necessary to display a new message [see 2.27.1.1.3 (d) and (e)] or when the communications are terminated.

D. On the same panel as the phone push button, messages shall be displayed which permit authorized personnel to communicate with and obtain responses from a trapped passenger(s) including a passenger(s) who cannot verbally communicate or cannot hear.

E. On the same panel as the phone push button a message shall be displayed that is activated by authorized personnel to indicate when help is on the way. The message shall continue to be displayed until a new message is displayed [see 2.27.1.1.4 (c)] or the communications are terminated.

F. A means to display videos to observe passengers at any location on the car floor to authorized personnel for entrapment assessment shall be provided.

G. Operating instructions shall be incorporated with or adjacent to the means of communication outside the car. Instructions shall conform to 2.27.7.3.




## 2.25 CORRIDOR OPERATING DEVICES

A. Provide new elevator operating and signal devices from not less than 3 mm (.125 in.) thick flat stainless steel with all edges beveled 15 degrees.

B. Corridor push button faceplates shall be sized to accommodate corridor pictograph on faceplate. The centerline of the landing push buttons shall be 15- to 48 inches above the corridor floor.

C. Elevator Corridor Call Station Pictograph shall be engraved on the faceplate.

D. Fasten all car and corridor operating device and signal device faceplates with stainless steel tamperproof screws.

E. All terminology and tactile symbols on the faceplate shall be raised by 030 inch with contrasting background, on square or rectangular plates recessed into the faceplate with its surface flush with the surface of the faceplate. The handicapped markings with contrasting background shall be 12.5 mm (0.5 in.) high raised .030 inch on the plate, square or rectangular. Use 6 mm (.25 in.) letters to identify all other devices in the faceplate. Surface mounted plates are not acceptable.

F. Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered.

G. The direction of each button shall be legibly and indelibly identified by arrows not less than 12.5 mm (.50 in.) high on the face of each button.

H. Landing push buttons should not re-open the doors while the car and hoistway doors are closing at that floor, the call shall be registered for the next available elevator. Calls registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button or infrared curtain unit.

I. Provide a separate fixture above the hall button fixture for emergency power indicator light, fire service recalls key switch and indicator light, fire recall instruction, communication failure light, communication audible enunciator, and reset key switch at the designated main floor.

J. Remove old fixtures, repair, and refinish walls.
K. Submit design of hall pushbutton fixtures for approval.
L. Remove old fixtures, repair, and refinish walls.

## 2.26 CAR LANTERN

A. Provide elevators with new car lantern indicators mounted on the car door entrances.
B. Provide means to indicate direction of elevator travel in response to a call. Lanterns shall light with the door open movement and shall stay lit until doors begin to close. Audible signal shall sound when the lantern is lit and shall sound once for up travel and twice for down travel.
c. Remove old fixtures, repair, and refinish walls.

## 2.27 HOISTWAY ACCESS

A. Provide new hoistway access switches for elevators at the top terminal landing to permit access to the top of car, and at bottom terminal landing to permit access to pit. Elevators with side slide doors, mount the access key switch 1830 mm (6 ft.) above the corridor floor in the wall next to the strike jamb.
B. Exposed portion of each access switch or its faceplate shall have legible, indelible legends to indicate "UP", "DOWN", and "OFF" positions.
C. Each access switch shall be a constant pressure cylinder type lock having not less than five pins or five stainless steel disc combination with key removable only when switch is in the "OFF" position.
D. Arrange the hoistway switch to initiate and maintain movement of the car. When the elevator is operated in the down direction from the top terminal landing, limit the zone of travel to a distance not greater than the top of the car crosshead level with the top floor. Submit design and location of access switches for approval.
E. Provide emergency access for all hoistway entrances, keyways for passengers and service elevators.

## 2.28 HOISTWAY ENTRANCES: PASSENGER ELEVATORS

### A. Existing Entrance Assemblies

Inspect and verify the condition of the existing center-opening hoistway entrance assemblies, including door panels, frames, sills, headers, hanger supports, strut angles, fascia plates, toe guards, and related components.

The existing door panels, frames, and entrance assemblies shall be retained and reconditioned where found structurally sound and suitable for continued service.

### B. Reconditioning of Retained Components

Clean, align, secure, adjust, and reuse the existing sills, hanger supports, strut angles, fascia plates, toe guards, and other retained entrance components.
Repair or replace any retained component that is damaged, excessively worn, corroded, loose, misaligned, or unsuitable for continued service.

### C. Dust and Hanger Covers

Provide new covers where the existing dust covers, hanger covers, or protective covers are damaged, deteriorated, improperly secured, or missing.

### D. Moving and Operating Components

Replace all moving entrance components, including:

1. Hanger rollers.
2. Upthrust or eccentric rollers.
3. Door gibs and retainers.
4. Separate fire-retaining devices where required.
5. Door-closing devices, springs, cables, relating devices, and associated hardware.
6. Pickup rollers and drive-roller assemblies.
7. Bushings, bearings, fasteners, and other operating components.

### E. Tracks

Inspect the existing door tracks for wear, deformation, corrosion, damaged running surfaces, loose fastenings, misalignment, vibration, and noise.
Clean, realign, secure, and recondition the tracks as required to provide smooth and quiet door operation. Replace tracks that are excessively worn, damaged, or unsuitable for continued service.

### F. Braille and Tactile Floor Identification

Provide new tactile floor-designation plates with Grade 2 Braille on both sides of each hoistway entrance frame.
Install the plates at the required accessible height and location. Replace all damaged, missing, incorrect, or noncompliant existing plates.

### G. Elevator Identification

Provide permanent identification of each elevator at the designated main Firefighters' Emergency Operation floor. Elevator numbers shall be clearly visible and not less than 3 in. high.

### J. Door Restrictor and Door Monitoring

Provide new car-door restrictors and door-position monitoring as specified elsewhere. Coordinate these systems with the center-opening entrances, door operators, interlocks, controller, and Firefighters' Emergency Operation.

### K. Final Adjustment and Testing

After completion of the work, adjust and test every entrance to verify smooth and quiet center-opening operation, proper panel alignment, secure gib and retainer engagement, positive interlock operation, correct door clearances, and reliable coordination with the car-door equipment and controller.

## 2.29 CAR GUIDES

A. Install four new adjustable roller guides, each assembled on a substantial metal base, to permit individual alignment to the guide rails.
B. Each guide shall consist of not less than three (3) wheels, each with a durable, resilient oil-resistant material tire rotating on ball bearings sealed-in lubrication. Assemble rollers on a substantial metal base and mount to provide continuous spring pressure contact of all wheels with the corresponding rail surfaces under all conditions of loading and operation. Secure the roller guides at top and bottom on each side of car frame and counterweight frame. All mounting bolts shall be fitted with nuts, flat washers, split lock washers, and if required, beveled washers.
C. Provide metal sheet guards to protect rollers on top of cars.
D. The entire elevator car shall be properly balanced to equalize pressure on all guide rollers. Cars shall be balanced in post-wise and front-to-back directions. A test for this balanced condition shall be witnessed at the time of final inspection.

## 2.30 CAR FRAME: PASSENGER ELEVATORS

A. Reuse the existing car frame. Tighten bolts and replace missing bolts.

## 2.31 CAR PLATFORM: PASSENGER ELEVATORS

A. Provide a platform guard (toe guard) of not less than 12-guage sheet-steel on the entrance side, extending 76 mm (3 in.) beyond each side of the entrance jamb. Securely brace platform guard to car platform and bevel bottom edge at a 60-75-degree angle from horizontal. Install the platform in the hoistway, so that the clearance between front edge and landing threshold shall not exceed 32 mm (1.25 in.).

## 2.32 CAR ENCLOSURE: PASSENGER ELEVATORS

A. Existing Car Enclosure

Retain the existing elevator car enclosures, subject to inspection and confirmation that the car shells, platforms, wall supports, front returns, ceilings, and related structural components are suitable for continued service.

The existing interior finishes, wall panels, flooring, ceiling components, handrails, trims, and accessories shall be removed, retained, refinished, or replaced as required by the final decorative design approved by the Owner.

B. Final Interior Design

Provide complete new interior decoration for both elevator cars. The final design, materials, colors, finishes, and arrangement shall be submitted to and approved by the Owner before fabrication or installation.

The completed cars shall present a uniform, durable, professional appearance appropriate for intensive public use within the Arecibo Judicial Center.

C. Wall Panels and Finishes

Provide new decorative wall panels, reveals, trims, bases, corner details, and related finishes in accordance with the approved design.

All materials shall be suitable for elevator use, securely attached, resistant to impact and normal wear, and compliant with applicable flame-spread, smoke-development, accessibility, and safety requirements. Existing wall surfaces and supports shall be cleaned, repaired, aligned, and prepared before installation of the new finishes.

D. Front Returns and Car Doors

Remove the existing front return panels and provide completely new front return assemblies for both elevator cars.

The new front returns shall be coordinated with the new car operating panels, service cabinets, digital indicators, emergency communication and video system, access panels, door equipment, and all related fixtures. Provide all required cutouts, reinforcement, mounting provisions, supports, fasteners, and removable access sections necessary for a complete installation.

The existing stainless-steel car-door panels shall be inspected, cleaned, repaired, adjusted, and refinished where suitable for continued use. Replace any car-door panel that is damaged, corroded, deformed, excessively scratched, or otherwise unacceptable to the Owner.

All new exposed stainless-steel components shall be Type 316 stainless steel with a No. 4 brushed finish, unless another material or finish is approved by the Owner.

F. Ceiling and Lighting

Provide a new suspended ceiling and LED lighting system coordinated with the approved car interior design. The ceiling shall be securely supported and arranged to permit access to lighting equipment, ventilation, emergency lighting, and the car-top emergency exit. Provide uniform illumination throughout the car and eliminate exposed wiring, damaged panels, loose components, and excessive glare.

G. Flooring

Remove the existing floor finish and provide a new floor system selected by the Owner. The flooring shall be durable, slip-resistant, securely installed, and suitable for heavy public use. The finished floor shall remain level with the car sill and shall not create a tripping hazard or reduce required door or accessibility clearances.

H. Handrails and Accessories

Provide new handrails, protective trims, base materials, and other accessories included in the approved design. Handrails shall be securely mounted, free of sharp edges, and arranged so they do not interfere with the clear floor area, operating fixtures, doors, or accessibility requirements.

I. Equipment Coordination

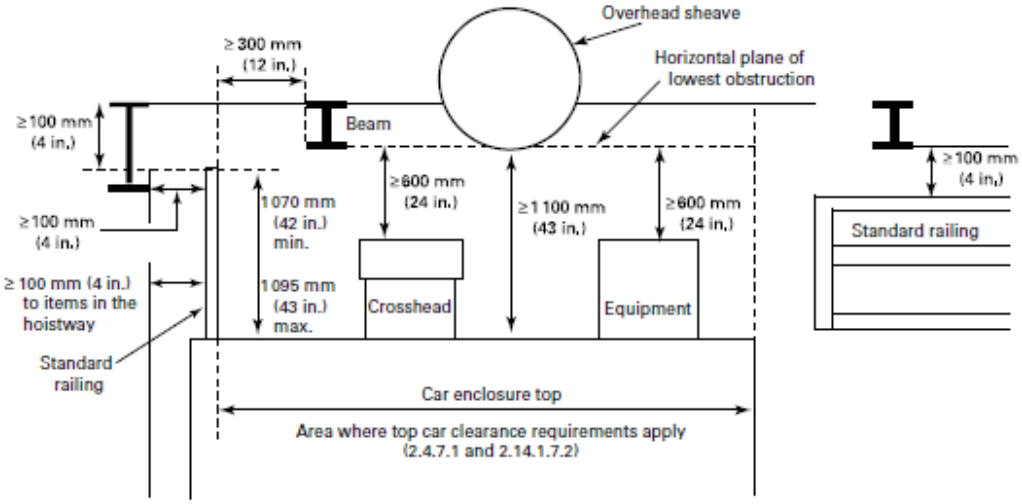
Coordinate the car decoration with the new car operating panels, door equipment, ventilation, lighting, emergency communication system, video camera, audible annunciation, inspection access, and all other modernization components.

Decorative panels ceilings, or accessories shall not obstruct the emergency exit, ventilation openings, communication devices, cameras, operating fixtures, door movement, or required maintenance access.

## 2.33 TOP OF CAR STANDARD RAILING (IF APPLY)

A. **Top Rail.** The top rail shall have a smooth surface, and the upper surface shall be located at a vertical height not less than 1 070 mm (42 in.) and not more than 1 095 mm (43 in.) from the working surface.

**Figure G-1 Top-of-Car Clearance Requirements (2.4.7.1 and 2.14.1.7.2)**




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## 2.34 POWER DOOR OPERATORS: PASSENGER ELEVATORS

### A. Existing and New Door Operators

Retain the existing **GAL MOVFR door operator serving Elevator No. 1, located on the left-hand side**, subject to inspection, testing, adjustment, and

verification that it is in satisfactory operating condition and fully compatible with the new controller and door equipment.

Remove the existing Otis door operator serving **Elevator No. 2, located on the right-hand side**, and provide a new high-speed, heavy-duty **GAL door operator of the same or current equivalent model** as the operator retained on Elevator No. 1.
Both operators shall be adjusted and coordinated to provide similar operating characteristics, door timing, reliability, maintenance requirements, and performance.

**B. Door Operator Performance**
The door operators shall automatically open the car and hoistway doors simultaneously when the elevator is properly positioned at the landing and shall automatically close the doors upon expiration of the programmed door-open time.

Provide microprocessor-based door control capable of continuously monitoring and adjusting door velocity, position, acceleration, deceleration, motor current, and torque. The system shall provide smooth, quiet operation, controlled stopping at the limits of travel, and prompt reversal when initiated by the Door Open button or door-reopening device.

Door speed, force, kinetic energy, timing, and reversal performance shall comply with the applicable requirements of ASME A17.1-2019.

**C. Car-Door Contact**

Provide a new car-door electrical contact for each elevator arranged to prevent normal operation unless the car door is fully closed, except when operation is specifically permitted during leveling, inspection, or hoistway-access operation.
The contact shall be protected against tampering from inside the car.

**D. Manual and Powered Door Operation**

The car and hoistway doors shall be capable of manual emergency operation when the elevator is within the unlocking zone. The doors shall not be opened by power unless the elevator is properly positioned within the permitted landing or leveling zone.

### E. Full-Height Door-Reopening Device

Provide a new full-height infrared door-reopening device for each elevator. The device shall prevent closing or cause the car and hoistway doors to reopen fully when a passenger or object is detected within the entrance.
The device shall remain operative whenever required during normal operation and shall function in accordance with the applicable Firefighters' Emergency Operation sequence.

### F. Obstruction Operation

If the door-reopening device remains continuously activated for an adjustable period of approximately 15 to 30 seconds, the doors shall remain open and an audible buzzer and voice message shall sound inside the car during automatic operation.

Door nudging shall not be provided. If an obstruction prevents the doors from closing without activating the infrared device, the door operator shall detect the abnormal resistance, reverse the doors to the fully open position, and keep them open until the obstruction is removed or an authorized closing command is initiated.

### G. Door Open and Door Close Buttons

Provide Door Open and Door Close push buttons in each car operating panel.
When the Door Open button is pressed and held, open doors shall remain open, and closing doors shall stop, reverse, and reopen. Momentary operation of the Door Close button shall initiate closing before expiration of the normal door-open time when permitted by the applicable operating mode.

## 2.35 HOISTWAY DOOR INTERLOCK

Provide a new listed landing-door interlock assembly for each hoistway entrance. Each interlock shall incorporate the required electrical and mechanical locking functions and shall comply with the applicable requirements of ASME A17.1-2019, Section 2.11. The interlocks shall:

1. Prevent normal operation of the elevator unless all applicable hoistway doors are closed and locked.

2. Prevent a hoistway door from being opened from the landing side unless the elevator car is within the permitted unlocking zone, except by an authorized unlocking means.
3. Confirm electrically that the door is closed and mechanically locked before the elevator is permitted to move.
4. Provide positive and secure engagement throughout normal operation.
5. Be suitable for heavy-duty public-building service and arranged for convenient inspection, adjustment, testing, and maintenance.

The interlocks shall be fully compatible with the existing center-opening hoistway entrances, the new controllers, the door clutch or vane assemblies, and the new or retained car-door operators. Provide all required pickup rollers, brackets, mounting plates, contacts, hardware, and adjustments necessary for proper mechanical and electrical operation.

G. INTERLOCK WIRING

Provide new wiring from the hoistway riser to each landing-door interlock and associated electrical contact.

The wiring shall be suitable and approved for elevator use and shall comply with the applicable requirements of ASME A17.1-2019 and the National Electrical Code. Conductors shall be properly supported, protected, identified, terminated, and routed to avoid interference with moving door equipment.

Flexible wiring used at moving entrance components shall be rated for repeated movement and shall be installed to prevent abrasion, strain, pinching, or damage during door operation.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Examine the work of other trades on which the work of this section depends. Report defects to the owner in writing that may affect the work of the Elevator Contractor.
B. Examine machine room for proper illumination, ventilation, electrical equipment, and beams are correctly located complete with access stairs and door.
C. Before fabrication, take necessary job site measurements. Check measurement of space for equipment and means of access for installation and operation. Obtain dimensions from site for preparation of submittals.
D. Work required prior to the completion of the elevator installation:
    1. Supply of electric feeder wires to the terminals of the elevator control panel, including circuit breaker.
    2. Provide light and GFCI outlets in the elevator pit and machine room.
    3. Furnish electric power for testing and adjusting elevator equipment.
    4. Furnish circuit breaker panel in machine room for car and hoistway lights and receptacles.
    5. Supply power for cab lighting and ventilation.
    6. Machine room enclosed and protected from moisture, with self-closing, self-locking door, and access stairs.
    7. Provide a fire extinguisher in the machine room.

### 3.2 ARRANGEMENT OF EQUIPMENT

A. Arrange equipment in the machine room so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same machine room. Locate controller near and visible to its respective hoisting machine.

### 3.3 WORKMANSHIP, INSTALLATION, AND PROTECTION

A. Installations shall be performed by Trained Mechanic and Apprentices to the best possible industry standards. Details of the installation shall be mechanically and electrically corrected. Materials and equipment shall be new and without imperfections.
B. Recesses, cutouts, slots, holes, patching, grouting, refinishing to accommodate installation of equipment shall be included in the Elevator Contractor's work. All new holes in concrete shall be drilled.
C. Structural members shall not be cut or altered. Work in a place that is damaged or defaced shall be restored equal to original new condition.

D. Finished work shall be straight, plumb, level, and square with smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. On completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.
E. Sleeves for conduct and other small holes shall project 50 mm (2 in.) above concrete slabs.
F. Hoist cables that are exposed to accidental contact in the machine room and pit shall be completely enclosed with 16-gauge sheet metal or expanded metal guards.
G. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact.

## 3.4 CLEANING

A. Clean machine room and equipment.
B. Perform hoistway clean down.
C. Prior to final acceptance remove protective coverings from finished or ornamental surfaces. Clean and polish surfaces regarding type of material.

## 3.5 PAINTING AND FINISHING

A. All equipment shall be painted one coat of approved color, conforming to manufacturer's standard.
B. Hoist machine, motor, shall be factory painted with manufacturers’ standard finish and color.
C. Controller, sheave, car frame and platform, counterweight, beams, rails and buffers except their machined surfaces, cams, brackets, and all other uncoated ferrous metal items shall be painted one factory primer coat or approved equal.
D. Stencil or apply decal floor designations not less than 100 mm (4 in.) high on hoistway doors, fascia, or walls within door restrictor areas. The color of paint used shall contrast with the color of the surfaces to which it is applied.
E. Elevator hoisting machine, controller, governor, main line shunt trip circuit breaker, safety plank, and crosshead of car shall be identified by 100 mm (4 in.) high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled or decaled.
F. Hoistway Entrances of Passenger Elevators:
    1. Door panels, except stainless steel surfaces, shall be given rust resistant treatment and a factory finish of one coat of baked-on primer and one factory finish coat of baked-on enamel.
    2. Fascia plates, top and bottom shear guards, dust covers, hanger covers, and other metalwork, including built-in or hidden work and structural metal (except stainless steel entrance frames and surfaces to receive baked enamel finish)

shall be given one approved prime coat in the shop, and one field coat of paint of approved color.

G. Elevator Cabs for Passenger Elevators:
   1. Interior and exterior steel surfaces shall be given rust resistant treatment before the finish is applied.
   2. Interior steel surfaces shall be factory finished with one coat of paint of approved color.
   3. Give exterior faces of car doors one finish coat of paint of approved color.

H. Elevator Cabs for Passenger:
   1. Interior and exterior steel surfaces shall be given rust resistant treatment before the finish is applied.
   2. Interior steel surfaces shall be factory finished with one coat of paint of approved color.
   3. Give exterior faces of car doors one finish coat of paint of approved color.

## 3.6 ELEVATOR GUARANTEE PERIOD OF SERVICE: MAINTENANCE SERVICE

A. Furnish complete maintenance service on each elevator installation for a period of one (1) year after completion and acceptance of each elevator in this specification by the Owner. This maintenance service shall run concurrently with the warranty. Maintenance work shall be performed by Elevator Mechanics and Apprentices.

B. This contract will cover full maintenance including emergency callback service, inspections, and servicing the elevators listed in the schedule of elevators. The Elevator Contractor shall perform the following:
   1. Monthly systematic examination of equipment.
   2. During each maintenance visit the Elevator Contractor shall clean, lubricate, adjust, repair, and replace all the parts necessary to keep the equipment in new condition and proper working order.
   3. Furnishing all lubricants, cleaning materials, parts and tools necessary to perform the work required. Lubricants shall be only those products recommended by the manufacturer of the equipment.
   4. Equalizing tension, shorten or renew hoisting ropes.
   5. As required, motors, controllers, selectors, leveling devices, operating devices, switches on cars and in hoistways, hoistway doors and car doors or gate operating device, interlock contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, signal system, car safety device, governors, tension sheaves, and buffers shall be cleaned, lubricated and adjusted.

6. Guide rails, overhead sheaves and beams, counterweight frames, and the bottom of platforms shall be cleaned every three months. Car tops and machine room floors should be cleaned monthly. Accumulated rubbish shall be removed from the pits monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Cleaning supplies and vacuum cleaner shall be furnished by the Elevator Contractor.
7. Always maintain smooth starting and stopping and accurate leveling.

C. Provide 24-hour emergency callback service that should consist of promptly responding to calls within two hours for emergency service should a shutdown or emergency development between regular examinations. Overtime emergency call-back service shall be limited to minor adjustments and repairs required to protect the immediate safety of people and equipment in and about the elevator.
E. Service and emergency personnel shall report to the Owner or his authorized representative upon arrival at the building and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the Owner or his authorized representative.
F. The Elevator Contractor shall maintain a logbook in the machine room. The log shall list the date and time of all weekly examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary correction performed, or parts replaced.
G. Written “Maintenance Control Program” shall be in place to maintain the equipment in compliance with ASME A17.1.

## 3.7 BIDDER’S QUALIFICATIONS

Each bidder must submit literature of the equipment it intends to furnish. Bids submitted without the equipment’s literature will not be considered. To qualify each bidder, they must submit a list of clients to whom similar work has been performed in the last ten years. The list must include names, addresses and the contact person telephone number, for each job.

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