PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes electric elevator equipment for cars and entrances specified in Division 14 Section “Elevator Cars and Entrances”.

1.3 QUALITY ASSURANCE

A. The work of this section shall be manufactured and installed by a company which specializes in the type of electric elevator work specified in this section and elevator cars/entrances specified in Division 14 Section “Elevator Cars and Entrances” as a single-source responsibility, with a minimum of 10 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents.
   1. Work shall be performed in compliance with Owner's insurance underwriters' requirements.
   2. Elevator subcontractor shall maintain locally an adequate stock of replacement parts for emergency purposes.

B. Contractor shall submit with bid a written certificate stating that a fully workable elevator system will be installed in full compliance with code requirements and Contract Documents.
   1. Certificate shall also state that, after Contract is signed, extra material, tools and labor for modifications, changes or additions which may be necessary to provide or maintain the required elevator system shall be provided at no additional cost to Owner.
      a. The certificate shall include the heat release/unit (BTU's/Hour) and power characteristics of the Contractor's elevators.
   2. Modifications, changes or additions include but are not limited to the following:
      a. Modifications to structure to accommodate elevator work.
      b. Modifications to mechanical and plumbing systems to accommodate elevator work.
      c. Modifications to electrical system to accommodate all requirements for the elevator work including normal power, emergency power, transfer switches and disconnect devices.
      d. Modifications associated with custom design finishes in Division 14 Section “Elevator Cars and Entrances”.
      e. Modifications required because of a change in heat release characteristics from those stated in the certificate above.

C. The controls shall not have any software embedded that shuts the elevator down if the equipment is not malfunctioning, and forces the Owner to call the manufacturer for service.

D. Elevator manufacturer shall guarantee that it will sell parts and printed circuit boards directly to the Owner and its designated representative.

E. Acoustical Environment:
   1. Elevators and associated equipment noise levels shall not produce noise levels in excess of NC40 in Lease Space.
   2. Acoustical environment within Lease Spaces will be free of any pure tone noises due to operation of elevator equipment for this Project.
      a. For the purposes of this specification, a pure tone shall be defined as a sound level in any one-third octave band which is greater than 5 dB above both adjacent one-third octave bands, in the range of 45 to 11,200 Hertz.

F. Manufacturer’s identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.
   1. Evidence of “patching” after removal of tags or marks is not acceptable.

1.4 SUBMITTALS

A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.

B. Shop Drawings: Shall clearly indicate but not be limited to:
   1. Coordination with car and entrance requirements specified in Division 14 Section "Elevator Cars and Entrances".
   2. Design information, including equipment lists and compliance with applicable agencies.
   3. Shaft layout in plan and section, including plan of car.
   4. Dimensioned layout of all Elevator Machine Rooms showing elevator equipment, air units, ductwork, mechanical, electrical and plumbing lines, structural elements and all accessories required to complete the work in compliance with Contract Documents.
   5. Connection requirements to building structure.
   6. Locations and amounts of loads and reactions to be carried on the building structure.
   7. Power confirmation which includes hp, code letter, starting current, full load running and demand factor for applicable motors.
   8. Design of hall lanterns, hall call push button and plates and car position indicators, including elevations and details of each.
   9. Description of each operating control and emergency device.
   10. Type of finish for all components and accessories.
   11. Rail calculations and design data to verify the following:
      a. Rails and brackets, designed for Seismic Zone criteria as shown on Structural Drawings.
      b. System to remain intact and fully functional while accommodating an inter-story drift ratio of .005H.
      c. Machinery and remaining components to accommodate the above.
   12. Vibration isolation materials and products noting minimum static deflections to be achieved and methods of mounting.

C. Samples:

Item No.	Quantity	Size	Description
S1	1	Actual	Illuminated hall call push-button and plate, completely fabricated to demonstrate design, finish and method of mounting.
S2	1	Actual	Hall lantern (each type).
S3	1	Actual	Illuminated arrival light, completely fabricated.
S4	1	Actual	Call push button fixtures for car operating panel.
S5	1	Actual	Braille identification medallion adjacent call push button fixtures in car operating panel.

NOTE: Coordinate with samples required for elevator car specified in Division 14 Section "Elevator Cars and Entrances".

D. Operations and Maintenance Manual: Shall clearly indicate manufacturer's printed instructions for operations and maintenance of installed work, including methods and frequency recommended for maintaining optimum conditions under anticipated use conditions and precautions against materials and methods which may be detrimental to finishes and performance and shall include:
   1. Straight line wiring diagrams of as-installed elevator circuits with index of location and function of all components.
      a. Leave one set in machine rooms.
      b. Provide 2 corrected sets of all documents, diagrams and manuals for Owner's file, 90 days after acceptance. Documents are property of Owner at time of completion.
   2. Lubricating instructions and recommended lubricant grade.
   3. Parts manuals for all components with sources indicated.
   4. Maintenance procedure manuals.
   5. Trouble shooting manuals.
   6. Special equipment for trouble shooting and adjusting, adjustments and performing safety tests.
   7. Adjusting procedure manuals.
   8. Verification that manufacturer warehouses parts locally with immediate access to major components, rotating elements, etc.
   9. If the Contractor requires the Owner to sign a lease for the special trouble shooting tool, a copy of the lease shall be submitted with the bid.

E. Forms of the following types:
1. Scheduled preventive maintenance activity copy.
2. Periodic inspection and test form.
3. Service order time sheet.
4. Maintenance time sheet.

F. Project Record Documents: Drawings as required and specified in [General Conditions and] [Division 1 Section “Closeout Procedures”].

G. Written Certifications: Required as follows:
1. Contractor shall provide a Certification which clearly indicates the following:
   a. Elevators are manufactured and installed in compliance with requirements of this section and Contract Documents.
   b. Elevators and associated equipment noise levels will not exceed levels as defined in Quality Assurance.
   c. Fabrication and installation of elevator hoistway doors, frames, hardware and accessories comply with code requirements for fire-rating.

H. Test Reports: Required as specified in this section under "Inspections and Testing".

I. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.

J. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions or using format in Division 1 Section “Closeout Procedures.”

1.5 DELIVERY, HANDLING, STORAGE

A. Comply with General Conditions and Division 1 Section “Product Requirements”, including the following:
1. For storage of materials and tools, a dry and protected area located adjacent to elevator hoistways is required.

1.6 WARRANTY

A. Comply with General Conditions and Division 1 Section “Product Requirements”, agreeing to repair or replace specified materials or Work that has failed within the warranty period. Failures include but are not limited to the following:
1. Unit which fails or does not operate properly due to inadequate field or factory workmanship, engineering or design, and requires replacement, repairs, or restoration of parts or components.
2. Rough or noisy operation.
3. Inability to operate at design capacity.

B. Warranty Inspection: At least 30 days prior to warranty expiration, schedule final inspection and retest with Owner.
1. Requirements shall include close examination of all equipment.
2. Replace, repair and adjust any equipment found defective prior to expiration of warranty period, with Owner’s consultation.

1.7 MAINTENANCE FOR NEW INSTALLATION

A. After equipment is accepted by the Owner, furnish regular maintenance for each elevator for a period of 3 months.
1. Maintenance service shall include a mechanic 40 hours per week (regular time Monday through Friday), and shall include all necessary adjustments, greasing, oiling, cleaning, and supply of parts and accessories necessary to keep the equipment in good operating condition, except such replacement of parts made necessary by misuse, accidents not attributable to failure of equipment or workmanship, and negligence on the part of Owner.

B. Repair Work: Shall be carried out only by the elevator subcontractor's personnel, using only standard parts furnished by Elevator Manufacturer.
1. Only genuine parts and supplies of quality used in manufacturing and installation of original equipment shall be provided.

2. Maintenance shall be carried out directly by the elevator subcontractor, and shall not be assigned or transferred to any agent.

C. Emergency Call-Back Service: 24-hour type with 30 minute response time is required.

D. All elevator work shall be performed by Contractor with construction personnel.
1. Maintenance personnel will not be allowed to complete the Work.

1.8 FULL-MAINTENANCE PROPOSAL

A. Submit a separate price for a full maintenance service with the necessary on-site staff for all elevators included in this section based on a 5 -year contract with price for extending on an annual basis for 5 years, in accordance with the following:
1. The service agreement shall commence at the termination of the maintenance period and shall continue for a period of 5 years thereafter.
   a. Either party may terminate this agreement at the end of the initial five year period.
2. Include annual, and 5 year safety tests and rail adjustments. Full 5 year tests shall be performed in year five, and included in agreement.
3. Submit alternate price for a full time mechanic and helper.
4. Include occupancy discount schedule.
5. Price shall be fixed for 5 years, subject to escalation criteria listed below.
6. The maintenance work shall be performed by workers directly employed and supervised by the manufacturer and installer of the equipment who are experienced and skilled in maintaining elevators similar to those to be maintained under this agreement.
7. Except for emergency minor adjustment call-back service, all work shall be performed during the regular working hours of regular working days of the Trade.
   a. If at any time it should become necessary, and only when so authorized by the Owner, to perform any portion of the work other than emergency call-back service during overtime hours, the maintenance contractor shall be reimbursed at the established billing rates for the difference between regular and overtime labor.
8. The maintenance contractor shall maintain all parts of the elevators consisting of, but not limited to, machines, motors, controllers, coils, brake shoes, windings, contacts, coils and resistance for operating and motor control circuits, governors and accessory equipment.

B. Maintenance work shall consist of the following:
1. Regular and systematic examinations, cleaning and lubrication.
   a. All lubricants, cleaning materials, paint, cotton waste, etc., are to be supplied by the maintenance contractor.
   b. All lubricants shall be of the proper grade for the purpose used.
2. Supplying, repairing and replacement of all parts of every description made necessary by wear and tear shall be at the maintenance contractor's cost.
   a. Only parts that are correctly designed and suitable in all respects shall be used.
   b. The maintenance contractor shall have and maintain on hand locally a supply of spare parts sufficient for the normal maintenance and repair of the equipment.
3. Keeping the exterior of the machinery and any other parts of the equipment subject to rust properly painted and presentable at all times.
   a. The motor windings are to be periodically treated with proper insulating compound.
4. The maintenance contractor shall not be required to make renewals or repairs necessitated by reason of negligence or misuse of the equipment by persons other than the maintenance contractor, maintenance contractor's representatives and employees, or by reason of any other cause beyond the control of the maintenance contractor, except ordinary wear and tear.
   a. The maintenance contractor will not be required under this agreement to install new attachments as may be recommended or directed by insurance companies or governmental authorities.
5. This service shall be performed solely by the manufacturer and installer of the equipment and shall not be assigned or transferred to any agent or subcontractor.
6. The price shall be subject to adjustment each year as follows:
   a. The material portion of the price shall be increased or decreased by the percentage of increase or decrease shown by the index of "Wholesale Commodity Price for Metals and Metal Products" published by the US Department of Labor, Bureau of Statistics, for the month within which falls the anniversary of the commencement of the service as compared with the index for the month as of the date of the Contract.

b. The labor portion of the price shall be increased or decreased by the percentage of increase or decrease in the straight time hourly cost for the month within which falls the anniversary of the commencement of the service as compared with such straight time hourly labor cost on the date of the contract.

1.9 PARTS AND PRINTED CIRCUIT BOARDS

A. Contractor guarantees that it will sell parts, printed circuit boards and microprocessor boards to the Owner and the Owner's Agent.
   1. The same shall not be dependent on an exchange component.

1.10 USE OF ELEVATORS

A. Elevators shall not be used for construction purposes, or during the period prior to turning over the Project to Owner, except with written authorization from Owner. If Owner authorizes temporary use of elevators, the following conditions shall apply:
   1. Contractor shall provide a "Temporary Acceptance Form" for user to sign.
   2. Neither the new installation period nor the guarantee shall start without Owner's written approval.
   3. User shall provide all temporary enclosures, guards or other protection of hoistway openings, power, signal devices, car lights, protection of any elevator entrances, cars, fixtures, and any other equipment installed.
   4. User shall return elevators in the condition which existed when Owner approved the "temporary use".
      a. User shall pay Contractor for all repairs and clean-up.
   5. User shall allow Contractor to perform routine maintenance and repairs.

B. As elevators are completed, Owner shall have the prerogative of accepting and using elevators, shutting the elevators down or accepting the elevators under an "Interim Service Agreement" described below:
   1. Owner shall have the prerogative of continuing the "Interim Service Agreement" until elevators in the group are complete.
   2. Guarantee period and new installation service shall start at the termination of "Interim Service Period".
   3. Cost of interim service shall not exceed the prorated cost of maintenance agreement required in this section.

PART 2 PRODUCTS

2.1 UNAUTHORIZED MATERIALS

A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 ACCEPTABLE MANUFACTURERS

A. General: Elevator systems of the following manufacturers are acceptable only after conforming with requirements of this section, Contract Documents and Architect's and Owner's approval:
   1. Otis Elevator Co.
   2. Schindler Elevator Corporation
   3. Thyssen Krupp Elevators
   4. KONE, Elevator
   5. Fujitec America
   6. Mitsubishi Elevator Company

B. Substitutions: Comply with General Conditions and Division 1 Section “Product Requirements” using form in Division 1 Section “Substitution Request Form”.

2.3 ELECTRIC ELEVATORS

A. Type: Electric elevator equipment system shall be complete with cars and entrances specified in Division 14 Section “Elevator Cars and Entrances”, and shall be designed, manufactured and installed in compliance with requirements of this section, Contract Documents and the following agencies:
   1. ASME A17.1 - Safety Code for Elevators and Escalators.
   2. ASME A17.2 - Inspectors' Manual for Elevators and Escalators.
   3. NFPA 80 - National Fire Protection Association Standard.
   4. NEC - National Electric Code.
   5. ADA - Americans With Disabilities Act of 1990 and 2010 Federal ADA Design Guide, and Regulations for Handicap Accommodations for State in which this Project is located. Shall comply to all federal, state and local requirements.

6. All applicable governing codes for locality in which Project is located.
7. City of San Francisco Bulletin AB090, if destination dispatch alternate is selected.

B. The Contractor shall provide for the following requirements for Work of Other Sections:
1. Elevator pit, including sump, block-outs, grouting for elevator sills, support for machine beams for overhead machines, block-outs in machine room floor slabs and other similar concrete work.
2. Structural steel work including divider beams if necessary to meet seismic requirements.
3. Elevator pit and buffer ladders, railings, chain-link fence partitions and sump pit grates.
   a. Installation of a vertical type ladder of noncombustible material where walk-in pits are not provided, and in pits that extend more than 3' below sill of pit access door.
   b. Installation of ladder within reach of access door and extend a minimum of 42" beyond sill of access doors.
4. Hoistway and enclosures, including cutouts for elevator equipment and components penetrating the enclosures.
5. Providing 75° cant or bevel guards at all projections, recesses or setbacks into hoistway which exceed 4" .
6. Field painting of any hoistway structural elements made visible when the elevator doors are open.
7. Providing machine room and hoistway ventilation and air conditioning units.
8. Protective enclosure around hoistway openings during construction and the protection of entrances after hoistway walls are in place, and elevator doors are in place.
   a. Protecting sills and thresholds.
9. Locating a Class "C" fire extinguisher with mounting bracket in machine room adjacent to machine room access door.
10. Electrical:
    a. Electrical wiring complying with ANSI and National Electrical Code.
    b. Conduits as required to complete the electrical work.
    c. Power for construction and testing.
    d. Two separate electrical feeders and disconnect devices for normal and emergency mainline power.]
    e. Electrical feeders and disconnect devices for normal and emergency car lighting and ventilation power.
    f. Emergency power to run designated elevators from emergency generator.
       1) Coordinate proper elevator operation with emergency generator control and ATS controls.
       2) Pair of conductors carrying a signal to the Elevator Machine Room to signal the loss of normal power and presence of emergency power.
    g. Pit and machine room lighting and GFCI convenience outlets, with a pit light switch accessible from pit access door.
    h. Smoke sensors to provide signal to elevators including wires in conduit to Elevator Machine Rooms.
    i. Two-way Firefighter's Telephone System and cable connected to Floor 1 Fire Command Station. Installation of speaker horn and strobe for fire alarm and communication system.
11. Building Security System:
    a. Providing two-way Security Voice Communication System (SVCS) cables from Elevator Machine Room to security system.
    b. Furnishing all security equipment that is required to be within the elevator cars.
    c. Furnishing all housings, brackets, mounts, and any other hardware required.
    d. Providing all cable terminations from provided traveling cable onto the Security equipment.

12. Contractor shall coordinate requirements for running clearances and cutouts of floor of the work platform.

C. Seismic Requirements:
1. In addition to code requirements design the elevator system to ensure that the following requirements are met:
   a. Elevator system including rails, brackets, machinery and all components are designed for the seismic criteria as shown on the Structural Drawings "General Notes".
   b. Elevator system including rails, brackets, machinery and all components to remain intact and fully functional while accommodating an inter-story drift ratio of .005H.

D. Mounting of Security Equipment:
1. The elevator subcontractor shall mount all security equipment that is required to be within the elevator cabs and shall allow the security subcontractor to terminate the provided cabling onto the mounted Security equipment and test the connections before sealing hidden equipment locations.

E. Elevator Intercom System:
1. Providing two-way Intercom System cables from Elevator Machine Room to Security Desk, as well as machine room to cab.
2. Providing all intercom equipment that is required to be within the elevator cars.
3. Providing all housings, brackets, mounts and any other hardware required.
4. Providing all cable terminations from provided traveling cable onto the intercom equipment.
5. Provide security desk intercom phone set.

2.4 CONTRACTOR'S RESPONSIBILITIES

A. The power source of the building is incapable of absorbing any energy created by an overhauling load on emergency power.
1. Contractor shall provide a means for absorbing regenerated power during emergency generator power operations.
2. Contractor shall be responsible for handling energy generated by an overhauling load during the switching to or from normal and emergency generator power operations.
3. Modifications requested at a later date will be at the expense of the Contractor.

B. The Contractor shall carefully review all architectural, structural, mechanical, electrical, graphics, security and plumbing drawings, specifications and any building conditions as they may affect the design, installation, use and maintenance of the elevators.
1. The Contractor shall review the emergency power circuitry and sprinkler design data to coordinate elevator connections with the electrical work.
2. The Contractor shall submit with its bid a certificate in writing stating its acceptance of all such elements of the design.
   a. Any exceptions shall be so noted on this certificate.
3. The cost for any changes required to produce a full workable, code-complying elevator system shall be borne by the Contractor, including structural, MEP and architectural changes.

C. The mechanical and electrical design for the elevators will be based on heat release and power characteristic information listed below in this specification.
1. The Contractor shall submit with bid any power characteristics or heat releases of this equipment that exceeds those listed below.
2. Any conditions or modifications requested at a later date will be at the expense of the Contractor.

D. POWER CHARACTERISTICS:

	Elev. Group	**Capacity (Lbs.)**	**Speed (FPM)**	**H.P.**	**Start AMP**	**Run AMP**	**Heat Release/Unit BTU's/Hour**
	PE I-4 Low Rise	3500	700	52	165	77	20,100
	PE 5-12 Low Mid Rise	3500	1000	78	240	100	29,800
	PE 12-20 High Mid Rise	3500	1200	92	285	115	34.900
	PE 21 – 28 High Rise	3500	1400	110	320	132	36,700
	PE-29 - 30 Public	2500	350	25	48	35	9,200
*	SE-1 & 2	5000	1000	71	190	89	31,200
	GE-1, GE-2 Garage	3500	350	29	52	40	10,130

All Amp. based on 460 volt system.
Maintain 50°F to 90°F, with 90% noncondensing humidity.

2.5 BUILDING ELEVATORS PE-1 THROUGH PE-4

A. Description of Equipment:

1.	Bank:	Low Rise.
2.	Function:	Passenger service.
* 3.	Floors Served:	Floor 1, 3 - 14.
* 4.	Stops & Openings:	13 stops, 13 openings; all in line.
5.	Rise:	Refer to Drawings.
6.	Quantity & Type:	4 gearless traction; machine located overhead.
7.	Capacity & Speed:	3500 lbs. at 700 fpm.
8.	Operation:	Group automatic.
9.	Control:	Variable voltage, variable frequency.
10.	Power Supply:	480 volts, 3 phase, 60 Hertz.
11.	Cab Inside:	6'-8" W x 5'-5" D clear inside.

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. Two hall call push-button risers.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.
7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.
8. Traveling cable provisions as indicated in Division 13 Section "BSS Elevator Interface" for security devices.

D. Cars and Entrances: As specified in Division 14 Section "Elevator Cars and Entrances".

2.6 BUILDING ELEVATORS PE5 THROUGH PE12

A. Description of Equipment:

1.	Bank:	Low Mid Rise.
2.	Function:	Passenger service.
3.	Floors Served:	Floor 1, 5, 15 - 30.
4.	Stops & Openings:	18 Stops, 18 openings; all in line.
5.	Rise:	Refer to Drawings.
6.	Quantity & Type:	8 gearless traction; machine located overhead.
7.	Capacity & Speed:	3500 lbs. at 1000 fpm.
8.	Operation:	Group automatic.
9.	Control:	Variable voltage, variable frequency.
10.	Power Supply:	480 volts, 3 phase, 60 Hertz.
11.	Cab Inside:	6'-8" W x 5'-5" D clear inside

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. Two hall call push-button risers.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.

7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.
9. Traveling cable provisions as indicated in Division 13 Section “BSS Elevator Interface” for security devices.

D. Cars and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances”.

2.7 BUILDING ELEVATORS PE13 THROUGH PE20

A. Description of Equipment:

1.	Bank:	High Mid Rise.
2.	Function:	Passenger service.
* 3.	Floors Served:	Floor 1, 5, 31 – 46 (2 elevators also serve Floor 2).
* 4.	Stops & Openings:	19 Stops, 19 openings; all in line.
5.	Rise:	Refer to Drawings.
6.	Quantity & Type:	8 gearless traction; machine located overhead.
7.	Capacity & Speed:	3500 lbs. at 1200 fpm.
8.	Operation:	Group automatic.
9.	Control:	Variable voltage, variable frequency.
10.	Power Supply:	480 volts, 3 phase, 60 Hertz.
11.	Cab Inside:	6’-8” W x 5’-5” D clear inside

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. Two hall call push-button risers.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.
7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.
9. Traveling cable provisions as indicated in Division 13 Section “BSS Elevator Interface” for security devices.

D. Cars and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances”.

2.8 BUILDING ELEVATORS PE21 THROUGH PE28

A. Description of Equipment:

1.	Bank:	High Rise.
2.	Function:	Passenger service.
3.	Floors Served:	Floor 1, 5, 47-61.
4.	Stops & Openings:	17 stops, 17 openings; all in line.
5.	Rise:	Refer to Drawings.
6.	Quantity & Type:	8 gearless traction; machine located overhead.
7.	Capacity & Speed:	3500 lbs. at 1400 fpm.
8.	Operation:	Group automatic.
9.	Control:	Variable voltage, variable frequency.
10.	Power Supply:	480 volts, 3 phase, 60 Hertz.
11.	Cab Inside:	6’-8” W x 5’-5” D clear inside

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors without faceplates as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. Two hall call push-button risers.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.
7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.

D. Cars and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances”.

2.9 BUILDING ELEVATORS SE-1 THROUGH SE-2

A. Description of Equipment:

1.	Bank/Function:	Service.
2.	Floors Served:	P3 through P1; 1 through 62.
3.	Stops & Openings:	65 stops, 65 openings; all in line.
4.	Rise:	Refer to Drawings.
5.	Quantity & Type:	2 gearless traction.
6.	Capacity & Speed:	5000 lbs. at 1000 fpm.
7.	Operation:	Simplex selective-collective with selective group automatic with SE-2.
8.	Control:	Variable voltage, variable frequency.
9.	Power Supply:	480 volts, 3 phase, 60 Hertz.
10.	Cab Inside:	5’-9” W x 8’-6-1/2” D, clear inside.

B. Signals:
1. Car Position Indicator: One Digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings. Provide one riser for each elevator to facilitate operating as two simplex cars when in split mode.
3. Hall Lanterns: Required at all floors with faceplates as detailed on drawings.

C. Miscellaneous Features:
1. One hall call push-button riser. Two risers to allow independent use of each elevator when in selective collective mode.
2. Automatic emergency power with manual override switch located in Fire Command Station.
3. Lighting/outlets/emergency lighting and alarm bell.
4. Firefighters service Phase I and Phase II.
5. A "secured mode" of operation.
6. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
7. Traveling cable provisions as indicated herein.
8. CCTV security camera mounting.

D. Car and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances.”

2.10 PASSENGER ELEVATORS PE-29 THROUGH PE-30

A. Description of Equipment:

1.	Bank/Function:	Passenger service.
2.	Floors Served:	Floor 1, 5.
3.	Stops & Openings:	2 stops, 2 openings; one front and one rear.
4.	Rise:	Refer to Drawings.
5.	Quantity & Type:	2 MRL; machine in hoistway.
6.	Capacity & Speed:	2500 lbs. at 350 fpm.
7.	Operation:	Group automatic.
8.	Control:	Variable voltage, variable frequency.
9.	Power Supply:	480 volts, 3 phase, 60 Hertz.
10.	Cab Inside:	6’-8” W x 4’-3” D, clear inside

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. One hall call push-button riser.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.
7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.
9. CCTV security camera mounting.

D. Cars and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances.”

2.11 GARAGE ELEVATORS GE-1 THROUGH GE-2

A. Description of Equipment:

1.	Bank/Function:	Garage passenger service.
2.	Floors Served:	Floor P3 through P1, 1.
3.	Stops & Openings:	4 stops, 4 openings; all in line.
4.	Rise:	Refer to Drawings.
5.	Quantity & Type:	2 MRL; machine in hoistway.
6.	Capacity & Speed:	3500 lbs. at 350 fpm.
7.	Operation:	Group automatic.
8.	Control:	Variable voltage, variable frequency.
9.	Power Supply:	480 volts, 3 phase, 60 Hertz.
10.	Cab Inside:	6’-8” W x 5’-5” D, clear inside

B. Signals:
1. Car Position Indicators: Two digital type.
2. Call Push Button Fixtures: Required for car and corridor as detailed on Drawings.
3. Hall Lanterns: Required at all floors as detailed on Drawings.

C. Miscellaneous Features:
1. Auxiliary car stations.
2. One hall call push-button riser.
3. Automatic emergency power with manual override switch located in Fire Command Station.
4. Lighting/outlets/emergency lighting and alarm bell.
5. Firefighters service Phase I and Phase II.
6. A "secured mode" of operation.
7. Glass panel in control panel front as indicated on drawings.
   a. Card reader supplied by security subcontractor to elevator manufacturer.
8. Traveling cable provisions as indicated herein.
9. CCTV security camera mounting.

D. Cars and Entrances: As specified in Division 14 Section “Elevator Cars and Entrances.”

2.12 PERFORMANCE

A. Speed: ±5 under any loading condition.

B. Capacity: Safely lower, stop and hold up to 125% rated load.

C. Maximum Level Variation: 1/8".

D. Door Closing Time, Thrust and Kinetic Energy shall comply with ANSI Code.

E. Floor-to-Floor Performance Time:
1. Measured from time door starts closing at one floor to fully opened and level on next successive typical floor, regardless of loading conditions or direction of travel.
2. Passenger MRL: 9.5 seconds maximum.
3. Passenger gearless: 8.8 seconds maximum.
4. Service gearless SE-1-2: 10.0 seconds maximum.

2.13 GROUP AUTOMATIC OPERATION/CONTROL SYSTEM

A. Required where scheduled with elevator types in this section.
* 1. Provide destination based dispatch control system for the Tower Passenger Elevators PE1 – PE28. Include a minimum of 8 free standing pods with touch screen control devices at the main lobby. Include two touch screens at each typical elevator lobby. Destination dispatch system shall interface with card reader access and have Owner available input from the building monitoring system. Provide a full destination system and not a hybrid split system. Provide an alternate price for full destination controls with security capabilities for the Tower Service Elevators SE1 and SE2. Include executive preference operation allowing access to select tenants providing private passage when their card is presented. Provide group operation as specified for remaining elevators.

B. General Operation and Control:
1. A microcomputer based control system shall be provided to perform all of the functions of safe elevator motion and elevator door control.
2. This shall include all of the hardware required to connect, transfer and interrupt power, and protect the motor against overloading.
3. System shall also perform car operational and group supervisory control.
4. Each controller cabinet containing memory equipment shall be properly shielded from line pollution.
5. Microcomputer system shall be designed to accept reprogramming with minimum system down time.

C. Anticipated Rush-in Device:
1. To maintain sufficient lobby elevator capacity to handle anticipated heavy rush-in traffic the system shall include a device to call all cars in the group to lobby without waiting for a lobby call.
2. Device shall only operate at predetermined heavy rush-in periods.
3. During these periods, cars shall be automatically dispatched from lobby when loaded nearly to capacity or, if not loaded to capacity, on a variable time interval calculated on the basis of the number of cars at lobby and other data representative of traffic in the system.
4. Cars shall continue to operate in this manner until end of predetermined period.

D. Off-Peak Geographical Spacing:
1. When cars are at rest, cars shall be assigned throughout the building to predetermined zones.
2. First car entering a zone shall become assigned to that zone.
3. A car may run through an occupied, assigned zone in search of an unoccupied zone in which to park.
4. While there are no calls registered the cars shall remain in a parked condition with doors closed.
5. Lowest zone shall consist of main floor and adjacent floor, above or below, as required to suit building design requirements.
6. Remaining floors shall be divided into nearly equal zones with one car randomly assigned to each zone.
7. Optimized response to hall calls shall be achieved by computing a relative system response (RSR) time for each registered hall call.
8. Computation of each car's RSR time to a hall call shall be based on, but not limited to, such relevant factors as distance, service to previously assigned car and hall calls, car load, direction, door and car motion status, and coincidence of car and hall calls.
9. Car with the least RSR shall have this call assigned to it.
10. RSR computations for each hall call are repeated several times a second and the hall call assignment might be changed if a more suitable car is found.

E. Moderate Up and Moderate Down Traffic Programs:
1. When incoming traffic at lobby floor increases as indicated by two cars leaving the lobby in up direction, filled nearly to capacity within a predetermined adjustable time period, cars assigned to upper zones shall be called to lobby without waiting for a lobby call.
2. Calls shall be automatically dispatched from lobby when cars become loaded nearly to capacity or, if not loaded to capacity, on a variable time interval calculated on basis of the number of cars at the lobby and other data representative of traffic in the system.
3. Cars shall continue to operate in this manner until lobby traffic has been reduced to a predetermined level.

4. When “DOWN” calls above lobby increase to a predetermined level, assignment of a car to lobby ceases and the lobby car shall travel up to assist other cars.
5. Cars arriving at lobby, after discharging passengers shall be dispatched upward.
6. Cars shall continue to operate in this manner until down traffic has been reduced to a predetermined level.

F. Anticipated Exit Device:
1. To prepare the system for heavy outgoing traffic, operation shall be such that upon arrival at the lobby of any car loaded more than a predetermined capacity during a regularly anticipated exit period, assignment of a car to the lobby ceases and lobby car shall travel up to assist the other cars.
2. Cars arriving at lobby, after discharging passengers, shall be dispatched upward.
3. Cars shall continue to operate in this manner until the end of regularly anticipated exit period.

G. Car-to-Lobby Operation:
1. Provide a key-operated switch for each elevator in the "Life Safety Panel" which when actuated, shall cause the corresponding elevator to make a trip to the lobby as soon as the car is available for response to special call.

H. Load Weighing Dispatching:
1. A load weighing device shall be provided which shall dispatch cars away from main lobby floor when the load in car reaches a predetermined capacity.
2. Load dispatch weight shall be adjustable by the Owner.

I. Load Weighing Bypass:
1. A load weighing device shall be provided which will be set to operate at predetermined percentage of the load in car.
2. Car shall bypass hall calls when this device is actuated.
3. Bypass load weight shall be adjustable and separate from load weighing dispatching weight.

J. Anti-nuisance:
1. A system shall be provided so that when the number of car calls is greatly disproportionate with the weight of the car all car calls will be canceled.
2. Ratio of calls to weight shall be adjustable.

K. Car Reversal Operation:
1. A car without registered car calls arriving at a floor where both "UP" and "DOWN" hall calls are registered shall initially respond to hall call in the direction that car was traveling.
2. If no car call or hall call is registered for further travel in that direction, car shall respond to hall call in opposite direction.
3. Direction lanterns shall indicate the change in direction when doors reopen.

L. Car Delay Operation:
1. If, for any reason, doors are prevented from closing and car is unable to respond to a call, the call shall be transferred to another car.

M. Car Station:
1. Car station shall contain a locked service cabinet.
2. Include certificate frame on door for Certificate of Compliance.

N. Car Button Independent Service:
1. Required for all elevators.
2. When a key-operated switch in car panel is activated, car shall disconnect from hall buttons and respond only to car buttons.
3. Car doors shall be closed by pressing "DOOR CLOSE" button.

O. Direction Lanterns:
1. Type: Shall indicate the change in direction when doors open.

2.14 SIMPLEX SELECTIVE-COLLECTIVE AUTOMATIC OPERATION/CONTROL SYSTEM

A. Required where scheduled with elevator types in this section.

B. General Operation and Control:
   1. Control of the elevator shall be automatic in operation by means of pushbuttons in the car numbered to correspond to floors served, for registering car stops and by "UP" or "DOWN" push buttons at each intermediate landing and call push-buttons at terminal landings.
   2. Buttons in car and hall stations shall be of the light-up type and indicate that a call has been registered for that landing.
   3. The momentary pressing of one or more buttons shall dispatch the car to designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which buttons are pressed.
   4. Each landing call shall be canceled when answered.
   5. When the car is traveling in the "UP" direction, it shall stop at all floors for which car buttons or "UP" hall buttons have been pressed; it shall not stop at floors when "DOWN" buttons only have been pressed unless the stop for that floor has been registered by a car button, or unless the "DOWN" call is at the highest floor for which any buttons have been pressed.
   6. The pressing of an "UP" button when the car is traveling in the "DOWN" direction shall not interrupt the travel unless the stop for that floor has been registered by a car button, or unless the up call is the lowest for which any button has been pressed.
   7. When the car has responded to its highest or lowest stop, and stops are registered for the opposite direction, its travel shall reverse automatically and it shall then clear the calls registered for that direction.
   8. Should both "UP" and "DOWN" calls be registered at an intermediate floor, only the call corresponding to the direction in which the car is traveling shall be canceled upon the stopping of the car at the landing.
   9. An adjustable time delay shall be provided so that after the car has stopped in response to a hall button, the entering passenger may register a car button before the car will reverse to answer calls in opposite direction.
   10. Each car station shall contain an emergency switch for stopping the car at any point in this travel.
       a. Opening of this switch shall not cancel registered calls; when the switch is closed the car shall continue to answer calls that have been registered.

C. Car Station:
   1. Car station shall contain a locked service cabinet.
   2. Include certificate frame for Certificate of Compliance.

D. Car Button Independent Service:
   1. When a key-operated switch in car panel is activated, car shall be disconnected from hall buttons and respond only to car buttons.
   2. Car doors shall be closed by pressing "DOOR CLOSE" button.

E. Car to Lobby Operation:
   1. Provide a key-operated switch for the elevator in the "Life Safety Panel" which when activated, shall cause the elevator to make a trip to the lobby as soon as the car is available for response to special call.

F. Door Hold Function:
   1. Provide a door hold function and button in each service elevator.
      a. When button is activated the doors shall remain open for a field adjustable time of 20 to 40 seconds.
      b. Once a floor button is activated in the car station the hold function shall cease and allow the car to respond to the call.

G. Split Group Operation:
   1. Provide a key switch at the ground floor hall station that will initiate a split simplex operation of the service elevators, each operating from a separate and adjacent set of hall buttons.

2.15 AUTOMATIC TWO-WAY LEVELING

A. Each elevator car shall have two-way leveling to automatically bring the car to a stop approximately level with any floor for a stop which has been initiated, regardless of load, rope stretch or direction of travel.

B. Automatic leveling control shall permit the synchronization of door opening with the stopping of car at a floor.

2.16 SECURED MODE OPERATION

A. For Elevators PE-1 through PE-30, GE1 and 2 with card reader control:
   1. All cars in a group selected for "Secured Mode Operation" shall be able to be changed from a "clear status" to a "secured status" by means of an on-off switch located at Floor 1 Security Desk.

2. While in the "secured status", all cars in a group shall be able to be set on a "limited time period clear status" by a key switch located at the Floor 1 Security Desk.
    a. This status will allow the cars in a group to be dispatched from Floor 1 for a limited time as determined by the Owner.
    b. At the end of this limited time period all cars in a group can be called to a floor above Floor 1 from that floor's hall call button.
    c. Only the Floor 1 call button in the cars will then be active.
    d. The secured status shall not bypass the card reader control mode.
3. Include capability to "lock out" individual floors during normal operating hours without calling an elevator mechanic.

B. For Service Elevator SE-1 and SE-2:
1. Car shall be able to be changed from a "clear status" to a "secured status" by means of an on-off switch located at Floor 1 Security Desk.
2. When car is in "secured status", car shall be capable of being returned to service the individually selected floors by use of a key-operated switch located adjacent to call button in car operating panel for each floor.

2.17 ELEVATOR TRAVELING CABLE

A. Provide the following elevator traveling cable for each elevator cab for security system use:
1. Provide two of the following: four pair (eight conductors) 20 AWG stranded copper cable with overall shield dedicated for card reader use in each elevator cab.
    a. These pairs shall be located in a cable that is not used to carry alternating current circuits.
    b. Cabling shall have two feet of available length at the card reader installation location within the elevator cab for each cab required to have a card reader as shown on Security drawings..
    c. Cabling shall have 10 feet of available length at the top of the cab for all other cabs for future card reader use.
    d. Cabling shall extend from the identified locations to the top of the elevator cab and into the card reader interface panel in the elevator machine room. Provide three feet of available length at SIS interface panel.
    e. Security subcontractor shall provide the card reader interface panel and all cabling terminations.
2. Provide three pair (six conductors) 20 AWG stranded copper cable with overall shield dedicated for Security Intercom System (SIS) remote (intercom) use in each elevator cab.
    a. Intercom shall be used as the emergency call intercom for passengers.
    b. Elevator subcontractor shall not provide their standard auto-dial based communication devices.
    c. Intercom is not to be used as the fire fighters communications method.
    d. Firefighters communication device shall be provided as required by code.
    e. These pairs shall be located in a cable which is not used to carry alternating current circuits.
    f. Cabling shall have two feet of available length at the intercom installation location within the elevator cab for each cab.
    g. Cabling shall extend from the identified locations to the top of the elevator cab and into the SIS interface panel in the elevator machine room. Provide 3 feet of available length at the SIS interface panel.
    h. Security subcontractor shall provide the SIS interface panel and all cabling terminations.
3. Provide two stranded core RG6U coax cable and one – two pair (four total conductors) 20 AWG stranded copper cable with overall shield to each elevator cab for CCTV camera use.
    a. Cable shall have two feet of available length at the CCTV camera installation location within the elevator cab for each cab required to have a CCTV camera as identified below.
    b. Cabling shall have 10 feet of available length at the top of the cab for cabs not required to have a CCTV camera.
    c. Cabling shall route from the device locations, to the top of the elevator cab, into the elevator machine room and into the corresponding panels in the elevator machine room.
    d. Coax shall route into the CCTV interface panel and the copper cable shall route into the CCTV power supply panel.
    e. CCTV interface panel, power supply panel, and all cabling terminations shall be provided by the security subcontractor.
    f. Elevators required to have a CCTV camera are: SE1, SE2.

B. Elevator subcontractor shall obtain the security devices for the elevators from the security subcontractor and shall mount them within the elevator cabs.
1. Security subcontractor shall provide any and all housings, brackets, mounts, etc, to the elevator subcontractor.

2. Elevator subcontractor shall mount all devices and all the security subcontractor to test all mounted security devices prior to sealing the devices for applicable devices.
3. Elevator subcontractor shall coordinate all required work with the security subcontractor.

C. Provide floor selection control for each elevator that is identified to have a card reader noted above.
1. Security subcontractor shall provide a floor selection control panel within the elevator machine room.
2. Panel shall provide independent floor selective control of each elevator cab.
3. Security subcontractor shall provide relays and terminal strips as needed within this panel to provide independent floor selective control of each floor serviced by the elevator.
4. Security subcontractor shall label the terminal strip's identifying each floor and identifying the relay that indicates secured mode to the elevator system.
5. Security subcontractor and elevator subcontractor shall provide all required connections for the following sequence:
   a. Individual signal from the security system for each elevator to:
      1) Place elevator in normal service, or
      2) Take the elevator out of service "park", or
      3) Place elevator in card reader control mode.
   b. During card reader control mode: The security system shall indicate to the elevator controller which floors are selectable (free access), if any.
      1) Security system shall indicate to the elevator controller which additional floors are selectable (for an operator changeable time period initially set at 2 seconds) after a valid card has been presented to the card reader.
      2) After the 2 seconds the security system shall disable all floors except the free access floors until the next valid card is read.

2.18 CARD READER OPERATION

A. For Elevators with Card Reader Control:
1. The security subcontractor shall provide a terminal cabinet within the Elevator Machine Room.
   a. The terminal cabinet shall contain one (1) maintained dry-contact relay for placing the elevator in card reader mode, and one (1) maintained relay per floor for every floor serviced by the elevator.
   b. The security subcontractor shall wire up to one side of the terminal [strip and label it with its function] [strips].
2. The elevator subcontractor shall wire up to [the other side of the terminal strip and into the elevator system as required] [connections with the security subcontractor].
   a. When the elevator is in card reader operation, the security system shall be able to enable/disable the floors that can be selected within the elevator.
   b. The security system shall also control the amount of time the elevator floor selection buttons are enabled.
3. The elevators shall automatically be taken out of card reader operation during any emergency service call.

2.19 SECURITY INTERFACE FOR ELEVATORS WITH CARD READERS

A. Elevator subcontractor shall provide space behind one face plate within each elevator for a card reader
1. Refer to the Architectural and Security drawings for location.
2. The security subcontractor shall furnish the card readers to the elevator subcontractor for mounting.
3. The elevator subcontractor shall provide all required mounting accessories and shall mount the card readers within the elevator cars.

B. The security subcontractor shall terminate the traveling cable provided by the elevator subcontractor within the elevator car to the mounted card reader.
1. The elevator subcontractor shall provide and mount glass panel to cover the mounted card reader.
2. Mount the card reader so the glass panel is flush to the front of the mounted card reader.

C. The security subcontractor shall furnish all security system related elevator equipment (including emergency communication equipment, intercoms) as shown on the Security Drawings to the elevator subcontractor for mounting.
1. The elevator subcontractor shall mount this equipment (as detailed by the Architect) and allow the security subcontractor to terminate the provided cabling and test the equipment before sealing the mounted equipment.
2. Coordinate this work with the security subcontractor.

D. Coordinate with the security subcontractor to ensure both the visual and audible requirements for emergency communication within the elevator are provided.
   1. The elevator subcontractor should provide raised letter and Braille permanently marked on the elevator faceplates as required.
   2. The faceplate shall comply with the Americans with Disabilities Act (ADA).

E. The elevator subcontractor shall provide a security control panel within each Elevator Machine Room to provide independent control of each elevator car.
   1. The elevator subcontractor shall provide relays and terminal strips within this panel.
   2. The elevator subcontractor shall label the terminal strip's identifying the required connections from the security system.
   3. Provide all required signals from the security system to allow the following independent operations for each elevator cab:
      a. Individual signal from the security system for each elevator to:
         1) place elevator in normal service, or
         2) take the elevator out of service "park", or
         3) place elevator in card reader control mode.
      b. During card reader control mode:
         1) The security system shall indicate to the elevator controller which floors are selectable (free access) if any.
         2) The security system shall indicate to the elevator controller which additional floors are selectable after a valid card has been presented to the card reader.
         3) Once one of the additional selectable floors has been selected, the elevator controller shall signal the security system that a selection has been made.
         4) The security system shall disable all of the additional selectable floors.
         5) If a selection of one of the additional floors has not been made within an operator changeable allotted time period, the security system shall disable all floors except the free access floors until the next valid card is read.

F. The elevator subcontractor shall wire from the elevator controller to the terminal strip and provide all connectivity among the terminal strips and relays.
   1. The security subcontractor shall wire all required connections from the security system to the labeled terminal strips.
   2. Coordinate the required connections with the security subcontractor.

2.20 REMOTE CONTROL PANEL

A. Provide a remote control panel in the Security Monitoring Room and Security Desk which shall be able to monitor the elevator operation, provide floor selective control, and have car to lobby control.
   1. Provisions need to be made in the Security Monitoring Room console and Security Desk.

B. Elevator bid price shall include the cost of all wiring and conduit from the various elevator banks to the security monitor.
   1. Monitor to have adequate memory capabilities to track operations for a minimum of 30 days.
   2. Coordinate monitor size and type to fit within security console design.
   3. Provide printing capabilities for traffic waiting time reports.

2.21 AUXILIARY OPERATION AND CONTROLS

A. General: In addition to primary control system features, provide the following controls or operational features for Passenger and Service Elevators, except where otherwise indicated.
   1. Operation shall be in accordance with ASME A17.1 and local requirements.

B. Special Emergency Service - Phase I:
   1. The activation of a 3-position key switch in the Lobby shall return all cars in the group express to the designated floor and bypassing all car and hall calls.
      a. Install a 2-position key switch in “Life Safety Panel”.
   2. Cars shall park at designated floor with doors closed.
   3. Provide a fireman's access button to open the doors.
   4. After doors are open by use of fireman's access button, doors shall time-out after 10 seconds and close.
   5. Elevators shall not respond to car calls unless the SES-II switch in car is activated.
      a. This system shall be in compliance with current Governing Codes.

6. Sensor Tie-In: System shall interface with smoke sensors, including alternate level refuge, and machine room (smoke sensors and wiring to hall buttons and machine room as specified in Divisions 15 and 16).
   a. Heat and smoke or products of combustion sensing devices shall be installed to the contacts on elevator controller to receive signals from sensing device.
7. If an elevator is on "Independent Service" when the elevator is recalled, a buzzer shall sound in the car and a jewel shall be illuminated in car as required.

C. Special Emergency Service - Phase II:
1. In-car control of each elevator during the emergency operation shall be provided by means of a key-switch in each car.

D. Emergency Power Operation:
1. The elevator system shall automatically run one preselected elevator per group down to the lobby floor at full speed where it shall park with doors open.
   a. The system shall then consecutively select elevators until all cars are parked at the lobby floor.
   b. The assignment shall then be passed back to a predesignated car.
   c. If any fail to run, the selection shall be passed on to the next car.
2. The system shall include a manual override for use by Firemen and by other authorized emergency personnel.
   a. Elevator system shall include manual interlocking push-button switches.
   b. One switch is required for each elevator for manual control; one automatic operation and one off position.
   c. The switches shall be located in the "Life Safety Panel".
3. Furnish and install the necessary equipment and wiring from respective elevator controllers to switches in the "Life Safety Panel".
4. Low mid, high mid and high rise elevator groups may have split feeders and two transfer switches for each group. Elevator controllers shall coordinate sequence of cars in operation during emergency power operation.

E. Alarm Bell System (with Electrical Power to Car):
1. Remote emergency alarm bell, located where directed, shall be heard outside the hoistway and arranged to sound automatically in response to activation of alarm button in car control system.
2. Provide alarm button contacts for security monitoring in accordance with Division 14 Section “Elevator Cars and Entrances” Division 13 Section “BSS Elevator Interface” Paragraph 2.16 Elevator Traveling Cable]

2.22 GRAPHICS

A. Letter Style: As specified Division 14 Section “Elevator Cars and Entrances.

2.23 HALL CALL PUSH-BUTTON RISER FIXTURE

A. Type: Self-illuminating LED buttons are required for all fixtures.

B. Custom Units: Required for all floors in accordance with architectural drawings.

C. Architectural Metals and Finishes:
1. Stainless Steel: Brushed Finish, No. 4, as defined in Division 14 Section “Elevator Cars and Entrances” under "Architectural Metal Finishes".

D. Emergency Warning Sign: Provide with diagram for each hall call button station, coordinated with architectural drawings and fabricated with acid-etched and Grade 2 Braille letters.

E. At SE-1:] Provide 24-hour 7-day working clock to turn Floor 1 hall call push-button on or off.
1. During normal hours the hall call push-button will register a call.
2. During secured hours a key switch in the hall call push-button face plate will register a hall call.
3. The key switch shall be spring loaded with the key removable in one position.

F. Fireman's Recall Switch: Provide a "Fireman's SES-I" recall switch for each bank of elevators in each Floor 2 Lobby in a hall call push-button riser fixture.

F. Fireman’s Phone Jack: Locate in each lobby in the hall call push-button riser fixture.

2.24 HALL LANTERN FIXTURES

A. For Passenger Elevator Entrances on all floors and all floors in Garage.
   1. Type: Round, white acrylic jamb mounted flush without frame as indicated on drawings complete with directional level chimes in compliance with ADA requirements.
   2. Furnish white LED bulb for "UP and DOWN" lantern.
   3. Required for Elevators PE-1 through PE30- without faceplates and Elevators GE-1 through GE-2 with faceplates at parking levels.
   4. Maintenance access to be provided through removal of the lens from elevator jamb face. Maintenance access from hoistway is not acceptable.
   5. Provide rated back boxes at areas where fixtures are located in door frames.
   6. Locations:
      a. Garage Elevators GE1-GE2 on Floors P3 through P1.
      b. Passenger Elevators PE1-PE23 on Floors 2-61.

B. For Service Elevator SE-1 SE-2:
   1. Type: Manufacturer's standard car riding type complete with directional chimes in compliance with ADA requirements.
   2. Furnish white LED bulb for “UP” lantern; red] LED bulb for “DOWN” lantern.
   3. Locate in car visible from vicinity of hall call push-buttons.

C. For Passenger Elevator Entrances on Floor 1:
   1. Type: As detailed on architectural drawings and complete with directional chimes in compliance with ADA requirements. Custom fixture.
   2. Furnish white bulb for "UP" Lantern; [red bulb for "DOWN" Lantern].
   3. Required for Elevators PE-1 through PE-30 and GE1 and GE2.
   4. Provide a control relay at each fixture to switch 120 volt power.

2.25 CAR POSITION INDICATORS

A. For Passenger and Garage Elevators: Two digital read-out fixtures per car.

B. For Service Elevators: One digital read-out fixture per return.

C. Fixtures shall include voice annunciator to comply with handicap requirements.

D. Location: Refer to drawings.

2.26 CAR OPERATING FRONT PANELS

A. For Elevators PE-1 through PE-30, and Elevators GE-1 through GE-2: Two operating panels in each elevator as indicated on the drawings.

B. For Service Elevator SE-1 and SE-2: One operating panel as indicated on the drawings.

C. Panels are an integral part of front swing panels as indicated on drawings and defined in Division 14 Section “Elevator Cars and Entrances.”

D. Flush mounted fireman’s telephone jack or permanent instrument located in a cabinet as required by local governing authorities with finish to match return panel and wiring and conduit to “Life Safety Panel”.

E. Provide cut out and mounting provisions in one front return in each passenger cab for LCD monitor to be provided by others, include labor to mount and wire the monitors.

2.27 CALL PUSH BUTTON FIXTURES FOR HALL AND CAR OPERATING PANEL

A. For passenger and Garage Elevator Hall and Car Operating Panels:
   1. Type: Raised, Stainless Steel US32D Satin Finish, with plastic cap, and halo with LED brilliant white lighting to match Otis Elevator “Luxury Series” buttons.

B. For Service Elevator Hall and Car Operating Panels:
   1. Type Raised, Stainless Steel US32D Satin Finish, with plastic cap, and halo with LED brilliant white lighting to match Otis Elevator "Luxury Series" buttons.

2.28 BRAILLE IDENTIFICATION MEDALLION ADJACENT CALL PUSH BUTTON FIXTURES IN CAR OPERATING PANEL

A. For Passenger, Garage, and Service Elevator Car Operating Panels:
   1. Product Type: Match "Stencil Cutting & Supply Co." Model "CC5", ANSI compliant.
   2. Size: 1.375" round.
   3. Thickness: 0.150".
   4. Character Height: 0.625".
   5. Character Style: [ ].
   6. Character Designated Color: Natural.
   7. Background Color: Painted.
   8. Mounting: Back Flange Mounting set flush with car operating panel.
   9. Finishes: Satin Stainless Steel.

2.29 LIFE SAFETY PANEL

A. Provide "Life Safety Panel" complete with wiring and conduits from the various elevators and Elevator Machine Rooms to Fire Command Station and Security Desk.

B. At Fire Command Station: "Life Safety Panel" shall include the following features:
   1. Position indicators for elevators.
   2. One Fireman's SES-I recall switch per elevator bank.
   3. One car to lobby switch for traction elevators.
   4. One drive switch and pilot light for each elevator.
   5. Emergency power pilot light and interlocking push-button switches for Fireman's override of automatic selection system.
   6. Faceplates:
      a. Stainless steel with Brushed Finish, No. 4, and protective coating as specified in Division 14 Section "Elevator Cars and Entrances" under "Architectural Finishes" complete with graphics.
   7. Graphics: Acid-etched letters in-filled with black paint.
      a. Letter style as specified in this section.
   8. Fireman's phone jack and wiring to elevator lobbies and cars.

C. At Security Room: Life Safety System shall include the following features:
   1. Computer and CRT to monitor and manage the elevator system.
   2. May be combined with functions of elevator monitoring system.

2.30 DIRECT DRIVE UNITS

A. A solid state AC power controller shall be provided to apply variable voltage variable frequency to the elevator motor armatures.
   1. The controller shall, during the acceleration and retardation periods, gradually change voltage applied to the elevator motor without interruption of the power to the motor.
   2. The system shall be designed to properly filter and control noise, spiking and other objectionable by-products.
   3. The successful bidder must be able to demonstrate that he has successfully installed similar equipment.
   4. The vertical acceleration rate shall not be less than 3.3 ft/sec^2 for speeds through 700 fpm and 4.0 ft/sec^2 for speeds over 700 fpm.

B. Drive Isolation:
   1. Drives shall operate satisfactorily when applied and connected to the building electrical power distribution system that has disturbance levels up to the maximum allowed in IEEE-519 current version standard for general systems.
      a. IEEE-519 current version shall be used as drive design guidelines for current harmonics.

C. Provide line reactors, line filters and motor filters on the line to prevent interference from line to drive and from drive to motor.
   1. Prevent motor noise and electrical distortion back to building electrical power supply system.
      a. Transformers, reactance units shall be mounted in neoprene-in-shear isolators similar to Mason Industries, Type ND, or as approved, with a minimum installed static deflection of 3/8".

b. The solid state rectification units shall be mounted on 3/4" thick neoprene waffle isolators similar to Mason Industries, Type Super W, or as approved, with a minimum installed static deflection of 0.15".
c. An effective electrical filter/reactance limiting electrical noise shall be provided.

2. Filtering System: Shall meet IEEE 519 current version, and FCC Class B standards.

2.31 ELEVATOR SUCCESSIVE STARTING

A. In the event all elevators in a group are shut down due to a lack of demand, or power failure, only a single elevator shall be allowed to start up at one time.

2.32 NORMAL STOPPING DEVICES

A. Provide slow-down and normal stopping devices on top of each car.

2.33 FINAL LIMIT SWITCHES

A. In addition to the normal limit stops, a hoistway final limit switch shall be installed at top and bottom of each hoistway.

B. Switches shall be located to open at or about the time the buffer is engaged by car or counterweight.

2.34 PIT SWITCH

A. An emergency stop-switch shall be located in pit accessible from pit access and/or hoistway door.

B. If pit depth exceeds 66", provide two (2) emergency stop switches.

2.35 GUIDE RAILS AND ROPES

A. Cars shall be complete with car and counterweight, guide rails, brackets, suspension ropes and connections.
1. Contractor shall furnish channel railbacking and stiffener brackets as required for all spans exceeding 13'-0" as required by code.
2. Guide rails shall be stiffened to accommodate rail support spacing or provide custom brackets to coordinate with divider beams to meet rail spans.
3. Guides shall be adequately sound-deadened.
4. Elevators shall be provided with roller type guides for cars and counterweights.

2.36 ELEVATOR COUNTERWEIGHTS

A. A counterweight shall be provided for each elevator equal in weight to approximately the weight of the car plus a minimum of 40% of rated load.

B. The open side or sides at bottom of counterweight runway shall be provided with a counterweight pit guard.

C. Provide counterweight safeties at all areas where occupied space is below elevator hoistways.

2.37 CAR AND COUNTERWEIGHT BUFFERS

A. Suitable oil buffers with necessary blocking and supports shall be provided under the elevator car and counterweight.

2.38 ELEVATOR COMPENSATION

A. Compensation shall be provided for weight of hoisting ropes and unbalanced portion of traveling cables.
1. Compensation shall consist of Whisperflex, iron or steel wire ropes, attached to underside of car and counterweight.
2. Pit Sheaves: Required where ropes are provided.

B. Provision shall be made for equalizing tension in rope compensation with idler sheave.

C. Idler Sheave Switch: With rope compensation an idler sheave switch shall be provided which will automatically cut off power from the elevator driving machine motor and brake when the sheave approaches either the upper or lower limit of travel.

2.39 ELECTRICAL WIRING

A. Electrical wiring shall comply with ASME and National Electrical Codes and all applicable local codes.
   1. Wiring shall be included for all devices installed.
   2. Furnish and install complete insulated wiring to connect all parts of the equipment.
      a. Properly ground all components as required by National Electric Code.
   3. Insulated wiring shall have a flame retarding and moisture resisting outer cover and shall be run in a metal conduit, metallic tubing, or wire ducts.
   4. Provide 6% spare wires between each controller, leveling device, hoistway junction box, and control panel, also, provide 6% spare conductors in each trail cable; all spares shall be properly tagged or otherwise identified with clear and indelible markings.
   5. Tag code all field wiring and junction points; control wiring in traveling cables at their terminals in the machine room; elevator car junction box and connections within the car.
      a. Test entire wiring system for insulation to ground.
   6. Provide traveling cable provisions as specified in Paragraph 2.16 Elevator Traveling Cable.

2.40 GUARDS

A. In addition to guards for sheaves and other similar items specified, guards are required for exposed gears, sprockets, tape or rope sheaves, or drives of selectors, floor controllers, or signal machines, and the ropes, chains, or tapes for driving same in machine rooms and secondary spaces.
   1. Kick Angles: Shall be included around all unprotected openings in the machine room floor.

2.41 TOP OF CAR OPERATING DEVICE

A. Each elevator shall be provided with an operating device mounted from or on the car crosshead which will permit slow speed (75 fpm or less) operation for purposes of adjustment, inspection, maintenance, and repair.
   1. A transfer switch shall be provided in the top of the car operating device fixture which will permit the disconnecting of hoistway access switch or switches and render top of car operating device operative.
   2. Operating device shall be mounted in a metal box and shall be rigidly secured in a position conveniently accessible to workmen on top of the car.
   3. Lamp receptacle with wire guard and grounded outlet shall be provided on top of each car in an easily accessible position.

2.42 LUBRICATION

A. Suitable means shall be provided for lubrication with oil or grease, all bearing surfaces in connection with the elevator installation.
   1. Grease gun fittings, if used, shall be suitable for high pressure guns.
   2. Grease cups, if used, shall be automatic feed compression type.

2.43 CAR AND COUNTERWEIGHT SAFETIES

A. Car frame and Safety Car frame shall be fabricated from formed or structural steel members and shall have adequate bracing to support the platform and car enclosure.
   1. Car safety shall be an integral part of the car frame with safety blocks located in the bottom members of car frame.
   2. Car safeties shall be the flexible guide clamp type.
   3. Provide counterweight safeties if space beneath counterweights is occupied.

2.44 ROLLER GUIDES

A. Type: Rubber-tired roller guides shall be mounted on top and bottom of car and counterweight to engage the guide rails.

2.45 MACHINE ROOM EQUIPMENT

A. Identification Numbers: Shall be indicated on drive machine, drive unit, controller and disconnect switch.

B. Machine:
   1. Type: Gearless traction with traction sheave and brake drum mounted directly on motor shaft and mounted on a continuous bed plate shall be provided and installed on steel beams.

C. Motor Type: Alternating-current reversible, designed for elevator service with high starting torque and low starting current.

D. Brake Type: Spring-applied, electrically-released and designed to provide smooth stops under variable loads.

E. Sound Isolation Pads:
1. Type: Mason Industries Type ND neoprene-in-shear sound-isolation pads (or manufacturer's standard approved equal) with a minimum static deflection of 3/8".
2. Required as follows:
   a. Install sound-isolation pads between machines, secondary deflector sheaves, motor generators, solid state drive units and buildings, and building structure to reduce noise transmission to occupied spaces and elevator cars.
   b. Isolate entire elevator/secondary deflector integral unitized base from Elevator Machine Room floor slab with sound-isolation pads.

E. Sound Control for All Elevators:
1. Support secondary deflector sheaves integrally from the unitized elevator base.
2. Resiliently isolate the entire elevator/secondary deflector integral unitized base from the Elevator Machine Room floor slab by means of effective neoprene-in-shear isolators having a minimum static deflection of 3/8".
3. Isolate the transformers and reactance units from the building structure by means of approved neoprene-in-shear isolators having a minimum static deflection of 3/8".
4. Isolate the hitch plates to the elevator cab by means of an elastomeric pad in compression designed to provide 1/8" deflection under dynamic loading.
5. Solid state rectification units shall be mounted on 3/4" thick minimum, neoprene-in-shear pad isolators and an effective electrical filter/reactance limiting electrical noise shall be provided.
6. Conduits and electrical connections shall not be fastened to or supported by elevator machinery or solid state rectification units, except by approved flexible connections.

F. Car Safety Governor Type: Centrifugal speed governor located at top of hoistway in machine room which will actuate a switch when excessive descending speeds occur, disconnecting power to motor and applying safety brakes.

G. Rotating Parts:
1. Shall be properly balanced to eliminate vibration.
2. Conduit shall not be secured to or supported by the controller frame, starter frame, or other machinery except by approved flexible connections.

H. Secondary Deflector Sheaves: Support integrally from unitized elevator base.

I. When solid state drives are used, isolate the 360 Hz. noise from being transmitted into the hoist machine base, rope, car, guide rails and lease spaces.

J. Isolate the hitch plates and the elevator car by means of an elastomer pad in compression designed to provide 1/8" deflection under dynamic loading.

K. Provide emergency stop switch in remote machine rooms.

2.46 ELEVATOR EQUIPMENT FINISH

A. General: The following shall be finished:
1. All elevator equipment, conduit, miscellaneous iron and steel work located within machine rooms or hoistways.
2. Elevator machines, motors, controllers, sheaves, door operators, car frames and platform, pit equipment rails, rail brackets, fascia plates, dust covers and exteriors of elevator cars.

B. Finish Requirements:
1. Preparation: Surfaces of motors, machines, gear casings, and other similar items, having holes or other surface imperfections shall be treated in shop with machine filler and smoothed off to remove surface imperfections before painting.
2. Primer: 1 coat rust-resistant primer, shop-applied.
3. Finish: 2 coats of flat black paint for equipment which is visible when elevators are open; 2 coats of gloss paint for other items.
4. Finish coats of paint can be shop-applied or field-applied.

PART 3 EXECUTION

3.1 PREPARATION

A. General:
1. Carefully review field dimensions and examine Project conditions before starting the work of this section.
2. Coordinate elevator work with work of other trades.
3. Notify Architect in writing of dimensions and conditions which are in conflict with requirements for elevator work, including proposed method for correction.
4. Starting the elevator work means acceptance of Project site conditions for performing the elevator work in compliance with Contract Documents.
5. Before starting the elevator work, shafts and openings for moving equipment shall be plumb, level and in line.
6. Pits shall be of proper depth, with waterproofing work completed.

3.2 INSTALLATION

A. Install elevator system in accordance with approved shop drawings, Contract Documents, applicable codes and manufacturer's published instructions and recommendations.

B. Welding: Perform in accordance with American Welding Society (AWS) Code applicable standards.

C. Guide Rails:
1. Shall be erected plumb within elevator manufacturer's recommended tolerances, supported and placed to remain free of distortion by eccentric loading or by application of safety devices.
2. Rails shall be installed in pit and extended to the underside of machine room and secured to steel brackets.
   a. Rails shall comply with seismic requirements.

D. Hoistway Entrances:
1. Entire front of hoistway shall remain open until hoistway entrance is installed.
2. After guide rails are properly aligned, install hoistway frames in alignment with guide rails.

E. Hoistway Smoke Sleeves: Comply with applicable codes.

F. Upon completion of the work, elevator shall provide smooth, quiet and accurate operations, free from side-to-side oscillation or vibration, in full compliance with applicable codes and Contract Documents.

3.3 INSPECTIONS AND TESTING

A. Tests shall be performed by the elevator subcontractor at subcontractor's expense in the presence of the Owner, Architect, Consultant and authorities having jurisdiction. The elevator shall be subjected to the following acceptance inspections and tests:
1. Inspection and tests required by applicable portions of ASME A17.1 and all current supplements.
2. Periodic inspection and tests as required by applicable portions of ASME A17.1 and all current supplements.
3. Inspection and tests required by Federal, State, and Local codes and ordinances.
4. A continuous operating test in which the elevator under full rated load is operated continuously for one (1) hour over its entire operating range, stopping momentarily at all floors.
   a. There shall be no operational failure of any component.
5. Test safety circuit, door lock circuit, loop circuit, and motor generator field circuits at 500 volts.
   a. Minimum resistance to ground shall be one megohm.
6. The Contractor shall present certified copies of the results of tests required by the ASME A17.1.

B. Test Results: In all test conditions, speed and performance times specified shall be met.
1. Leveling accuracy shall be maintained without relevelling.
2. General riding quality shall be acceptable to Owner and Architect.
3. Temperature rise in windings shall not exceed 50°C above ambient.

C. Emergency Systems Testing:
1. The elevator subcontractor shall participate in the building standby generator testing. The following features are to be demonstrated during this test:
   a. Elevator Recall: Demonstrate the elevators ability to accept a signal (contact closure) from the Division 26 automatic transfer switch upon loss of power and initiate the following sequence:
      1) With all elevators in motion, automatically recall one elevator per bank at a time to the ground floor.

2) Upon recall of an elevator, the doors to the elevator shall open to permit passengers to leave elevator.
3) After a time delay, the doors to the elevator shall close and the elevator shall shutdown.
4) This sequence shall continue until all elevators have been recalled.
5) After recall is completed, one car per bank shall have the capability of being automatically or manually selected for operation.

b. Elevator Presignal: Demonstrate the elevators' ability to accept a presignal (contact closure) from the Division 26 automatic transfer switch prior to transfer between live sources in either direction and initiate the following sequence:
1) Upon receipt of the presignal, all operating elevators shall recall to the nearest level, open their doors to permit passenger unloading and, after a time delay, shutdown.
2) After the transfer has been completed, all elevators shall return to normal operation.
3) Presignal required both before transferring to EM power and when transferring back to normal power.

2. The elevator subcontractor shall participate in the building fire alarm system testing. The following features are to be demonstrated:
a. Recall (fire alarm): Demonstrate the elevators' ability to accept a signal (contact closure) from the Division 26 fire alarm system and initiate the following sequence:
1) A contact closure shall be provided to the elevator controls for the elevators serving the lobby of incidence shall automatically return to their designated floor where they shall park with their doors closed.
2) If the fire floor of incidence is the designated floor, the elevator cars shall return automatically to an alternate floor.
b. Recall (shunt-trip): Demonstrate the elevators' ability to operate the shunt trip function for elevator power and open the automatic sprinkler control valve. The following sequence shall occur:
1) Upon receipt of signal (contact closure) from rate of rise heat detector located at the top of the elevator shaft, the elevator controller shall, provide a signal (contact closure) to operate the shunt trip function and open the automatic sprinkler control valve.

D. Elevator Shunt Trip Function:
1. Smoke detectors located in the Elevator Machine Room, elevator lobbies, and elevator shafts shall recall the elevators to the designated floor of recall.
a. Smoke detectors shall be connected to the main floor fire alarm panel and shall not operate the shunt trip function or the sprinkler system control valve.
2. Rate of rise heat detectors located at the top of the elevator shafts shall operate the shunt trip function for elevator power and open the automatic sprinkler system control valve.
3. Rate of rise heat detectors shall have a setting of 10°F lower than the setting of the automatic sprinklers in the elevator shaft.
4. An independent control panel for the rate of rise heat detectors shall be used to disconnect the elevator power in accordance with Article 620-51(a) of the NEC.
a. This independent control panel shall be monitored by the main fire alarm control panel.
b. Activation of rate of rise heat detector shall be annunciated at the main fire alarm panel.
5. The elevator annunciator panel shall be provided with a red light to indicate sprinkler activation in the machine room.

E. Elevator Card Reader Control Testing:
1. Provide, in conjunction with the security subcontractor, testing and demonstration of all operating sequences under card reader control.

F. Damage to car or to building structure caused by the performance of required testing shall be repaired at no additional cost to Owner.

3.4 FINAL ACCEPTANCE

A. For Owner's review for final acceptance, submit to Owner all certifications and test results indicating elevator system is designed, manufactured and installed in compliance with requirements of this section, Contract Documents and applicable regulatory agencies.

END OF SECTION