**ATTACHMENT 2**
**PLANS AND SPECIFICATIONS PROVIDED BY HKA ELEVATOR CONSULTING**

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# VERTICAL TRANSPORTATION
MODERNIZATION SPECIFICATIONS

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**SECTION 14221**

**MODERNIZATION OF ELEVATORS**

## PART 1 - GENERAL:

1.01 DEFINITIONS:

A. Main Lobby: Ground Level unless otherwise indicated.

B. Fire Recall Level: As directed by local fire authority.

C. Alternate Fire Recall Level: As directed by local fire authority.

D. Non-Proprietary: It is recognized that each manufacturers system contains components that are proprietary to the development of their systems. The Owner may wish to have the elevator system maintained by another technically qualified service provider and by submitting a bid for this project, the manufacturer shall guarantee that for a minimum of 20 years they will provide the following:

1. Diagnostic, adjusting and monitoring tools for all components including documents, manuals, wiring diagrams and spare parts as listed in Part 3 of this specification shall be provided in each machine room, controller room or machine space as a permanent part of the installation and become the property of the Owner. Devices shall be permanent at no additional cost to Owner, shall not self destruct, require charging or exchange. Remote monitoring devices are excluded from this requirement, however if such devices are removed all wiring shall be neatly terminated, tied within a junction box and properly marked as to its content.

2. Manufacturer shall guarantee to support the equipment for this project with regard to notification to Owner of system corrective updates, provide and install such updates at no cost to Owner.

3. Provide contact information for their separate parts warehouse so that the Owner or designated service provider can order parts on a 24 hour basis and delivered with 48 hours.

4. Provide a list of parts of each component manufactured and stored at the warehouse and the retail cost of each at close out of the project and estimated escalation cost. The cost of these parts is what would be charged to Owner or other service provider.

5. Provide contact information for technical support so that the Owner or designated service provider can obtain technical support on a 24 hour basis to provide assistance in trouble shooting problems. Indicate hourly rate charged to Owner or designated service provider for such service.

1.02 DESCRIPTION:

A. Modernization work included in this section:

1. Modernize existing traction and hydraulic elevators complete as shown and specified.

a. Modernize traction elevators no. 1 through 19 and 21 with new controls, encoders, motor drive units, signals and fixtures, door operating equipment, entrance equipment, hoistway wiring, interior finishes, and recondition other equipment as specified.

b. Modernize hydraulic passenger elevators no. 20 with new controls, signals and fixtures, interior finishes, door operating equipment, hoistway wiring, hydraulic cylinder, and recondition other equipment as specified.

B. Examination of site:

1. Contractor shall visit the building, examine the existing elevators, contract documents, determine condition of all retained components, space conditions, power supply, standby/emergency power supply, and mainline disconnect.
2. Prior to commencement of work, Contractor shall conduct a ride analysis using an accelerometer on each elevator to document the current ride conditions.
3. Make all surveys necessary to meet the requirements of this specification and compatibility to products provided.
4. If any discrepancies are noted, or if work not specified is required, Contractor shall bring such matters to the Owner's Representative's attention within seven days prior to bidding. If no discrepancies are noted or exceptions taken, it is assumed that all conditions are satisfactory. Failure to do so, Contractor shall be liable for any costs related to structural, mechanical or electrical requirements to accommodate specified equipment.
5. Contractor shall assume responsibility and provide full maintenance of the elevator equipment upon award of this contract and shall continue such throughout the modernization.

C. Related work included in this section:

1. Contractor shall visit the building, examine the existing conditions, power supply, standby/emergency power supply, mainline disconnect, and include all work needed to ensure a fully code compliant modernization. Contractor or his sub-contractors shall perform this work, which may include but is not limited to the following:
   a. Mechanical:
      1) Hoistways: Patching of plaster in hoistways, machine rooms and controller areas, all properly framed, enclosed and adequately ventilated.
   b. Electrical work:
      1) Power feeders: Modification to existing or installation and connection of three phase power through fused mainline switches or circuit breakers and extended to terminals of controllers. Provide continuous ground where needed.
      2) Light circuits: Single-phase circuit through disconnects and extended to controller for car lights and fan.
      3) Communication circuit: Telephone circuit terminated at junction box of each controller.
      4) Illumination: Lights, light switches and convenience outlets in pits, machine rooms, controller areas and overhead sheave spaces.
      5) Conduit: Installation of electrical conduit and pull boxes with pull wire between hoistways and remote locations of each indicator and control panel.
      6) Common circuit: Dedicated pollution free single phase 20-ampere circuit through fused mainline switch or circuit breaker and extended to common group controller for each bank of two elevators or more.
      7) Standby power: Automatic transfer of standby/emergency power and lighting supply through normal feeders with means of absorbing regenerative power. Two No. 14 wires from "Form C" contacts on transfer switch to designated controller to elevator machine rooms to signal transfer of power.
      8) Sensing devices: Installation and or modification to smoke detectors, heat detectors or products of combustion sensors in elevator lobbies, machine rooms, hoistways and alternate fire recall floor with circuits terminated at junction box in machine rooms for emergency fire service operation.
      9) Life safety circuits: Circuits terminated at junction box at each controller for life safety speakers and fireman's phone communication. Note phone jacks are not permitted in corridor call button boxes.

c. General:

1) Access: Legal access consisting of self-closing and locking access doors, ladders, gratings and steps to machine rooms, controller areas, pits and hoistways.

2) Supports: Providing supports as shown to carry structural reaction, impact and uplift loads imposed by elevator equipment.

3) Patching: Patching of floors, walls and surfaces constituting final finishes.

4) Block-outs: Block-outs, pockets and chases in walls and floors for entrances, signals, fixtures, cables and conduit.

5) The elevator contractor shall include 3 crane mobilizations for lifting material to the roof of the building.

2. Barricades: Full height lockable barricade for protection of open hoistways during construction.

3. Temporary screens: Contractor shall provide between elevators before construction starts and remove at completion of project.

4. Painting: Field painting of prime-finish items constituting final finishes.

5. Finish floor: Installation of finish floor in passenger elevator cars.

6. Life safety or public address speakers: Including wire from machine room to car, accommodations and installation in car canopy.

7. Card readers: Including wire from machine room j-box to car top j-box, interfacing with elevator controls and installation in elevator car, connection in machine room and testing of system. Note card reader panel is not allowed inside the machine room.

8. Closed circuit T.V: Including wire from machine room j-box to elevator car top j-box, connection in machine room and testing.

9. Key cylinders: Furnished by Owner's Representative, installed under this section.

## 1.03 QUALITY ASSURANCE:

1. Manufacturer's qualifications: The design, engineering and manufacture of major elevator components such as machines, motors, motor drive units, controllers, door operators, safeties, governors, selectors, etc. shall be from manufactures that have been in the business for the last ten (10) years. Equipment proposed must have a history of successful operation under similar conditions for the last two (2) years.

B. Sub-contractors:

1. Contractor shall be solely responsible for any and all of the work done by his sub-contractor or other employees and all orders or instructions from the Owner's Representative shall be through him to them. It shall be Contractor's duty to see that all of his sub-contractors commence their work properly at the proper time, and carry it on with due diligence so that they do not delay or injure either work or materials; and that all damage caused by them or their workmen is properly made good by them or by himself at his cost. Contractor shall submit names of his sub-contractors for approval by the Owner's Representative.

2. The use of sub-contractors is to be limited to work outside the scope of elevator construction work; example, patching, painting, coring of walls, marble work and refinishing.

C. Elevator cabs and entrances:

1. Manufactured or rehabilitated by one of the following or accepted equal:

a. City Lift

b. Travertine

c. Winter & Bain

d. Sterling Corporation

D. Quality of work and workmanship:

1. When completed, the installation shall be modern in all respects.

2. All components specified as new shall be provided as new. All components specified to be retained may be provided as new at Contractor's option subject to approval of Owner's Representative. All retained components are to be examined, cleaned, adjusted, repaired and/or replaced with new parts. Contractor must be willing to accept all retained equipment on full maintenance without prorating.

3. All work performed shall be conducted in a workmanship type manner.

E. Requirements of regulatory agencies:

1. Codes: In accordance with the latest applicable edition requirements of the following and as specified:

a. A.D.A.: Americans with Disabilities Act.

b. ASME: American Society of Mechanical Engineers - A17.1; Safety Code for Elevators and Escalators.

c. CBC: Title 24; California Building Codes.

d. CCR: Titles 8; California Code of Regulations.

e. NEC: National Electric Code. NFPA-72.

f. IBC: International Building Code.

g. All local codes, which govern.

F. Permits:

1. Arrange and pay for inspections by governing authorities and obtain operating permits.

G. Safety policies:

1. Installation and maintenance contractors are required to follow their company's safety practices and policies as well as the practices and policies of the building management.

H. Security:

1. All personnel shall be required to pass security screening, convicted felons will not be allowed on site.

2. Due to the nature of the courthouse a tool control program is in place and all tools shall be inventoried everyday.

## 1.04 SUBMITTALS:

A. Shop drawings:

1. Submit three copies of the following prior to ordering any materials:

a. Layouts: Plan of machinery spaces showing new equipment and existing equipment; include impact and static loads imposed on building structure, if such should change, and clearances around equipment.

b. Details: Submit details of cabs, fixtures and entrances.

c. Data: Indicate on layouts or separate data sheets; machine spaces heat release, power requirements, conduit runs outside of hoistways and machine rooms, car and counterweight roller guides, control systems, motor drive units and door operators.

B. Samples:

1. Provide samples of materials and finishes exposed to public view and additional, if specifically requested, 6 inch x 6 inch panels, 12 inch lengths or full size if smaller, as applicable.

C. Operating instructions:

1. Submit manufacturer's literature describing system operations and special operations as specified.

D. Safety policy:

1. Submit a copy of the company approved safety policy.

E. All submittals shall be processed pursuant to section 16 of Exhibit B of the Agreement.

## 1.05 INTENTIONALLY OMITTED :

## 1.06 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Delivery and storage:

1. Protect equipment during transportation, erection and construction. Store under cover to prevent damage due to weather conditions. Replace damaged materials. Storage space on site will be available.

B. Handling:

1. Owner’s Representative has the first right of refusal to retain any elevator components that are to be removed and modernized with new equipment. All removed components shall remain property of the Owner’s Representative, until the Owner’s Representative notifies Contractor, in writing, of removed components that Owner’s Representative would like to retain. All remaining elevator equipment not to be retained by the Owner’s Representative or reused by Contractor shall be promptly removed from the building by Contractor at no cost to the Owner’s Representative, and become the property of Contractor.

2. Contractor shall make every attempt to recycle removed elevator equipment. Contractor shall correct any damage to building surfaces and surrounding areas if damaged during removal of this equipment at no cost to the Owner’s Representative.

## 1.07 SCHEDULING AND SEQUENCING:

A. Schedule:

1. Submit construction schedule with bid indicating time required from award of contract to;

a. Equipment fabrication and delivery to site.

b. Installation testing and final acceptance of all elevators.

2. Contractor shall be responsible for scheduling related work with other sub-contractors to avoid omissions and delays in job progress. Elevators shall not be removed from service, without prior approval, until all equipment has been manufactured and delivered to the project site for all elevators.

B. Sequence:

1. Work under this contract shall be done in the following sequence. Any change to this must be approved by the Owner's Representative. Complete all work for each sequence before proceeding with the next.

a. Sequence (1) One: Elevator No. 1, 4, 16, & 14

b. Sequence (2) Two: Elevator No. 2, 5, 17, & 15

c. Sequence (3) Three: Elevator No. 3, 6, 11, & 18

d. Sequence (4) Four: Elevator No. 7, 8, 12, & 19

e. Sequence (5) Five: Elevator No. 9, 10, 13 & 21

f. Sequence (6) Six: Elevator No. 20

C. Continuity of service:

1. The most efficient means of elevator service shall be provided at all times.

2. All elevators shall operate as an efficient group except for those in the sequence that are out of service.

3. Provide a temporary overlay on Nos. 1-10 to interface between new group dispatching system, newly completed modernized elevators and elevators not yet modernized.

4. This system shall be installed in operation and tested by the Owner's Representative after completion of Sequence (1) One and prior to beginning work on Sequence (2) Two. This system shall be tested at the end of each sequence.

5. Temporary shutdown of any elevator to complete circuit connection to group operation must be done outside of normal working hours of the building and approved by Owner's Representative.

D. Building operations:

1. The building will remain in operation during the execution of this contract. Cooperate with building management in scheduling work in such a way as not to cause interruption of or interference with the building operations.

E. Electrical shutdowns:

1. Temporary electrical shutdowns will not be allowed except for brief periods to be scheduled for outside 6:00 AM to 7:00 PM and that at least 48 hours in advance and approved by Owner's Representative.

## 1.08 WARRANTY:

A. Guarantee and Warranty:

1. Provide special project warranty, signed by Contractor, Installer and Manufacturer, agreeing to replace/repair/restore defective materials and workmanship of all work performed which may develop within one (1) year from final date of completion and acceptance of the **entire installation**. "Defective" is hereby defined to include, but not by way of limitation, operation or control system failures, performances below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration and similar unusual, unexpected and unsatisfactory conditions.

## PART 2 - PRODUCTS:

### 2.01 DESCRIPTION OF SYSTEMS:

A. Elevator No. 1-10:

| | | |
|---|---|---|
| 1. | Type: | Gearless Traction |
| 2. | Capacity: | 4000 Pounds |
| 3. | Speed: | 600 FPM |
| 4. | Stops: | 21 |
| 5. | Openings: | 21 In Line |
| 6. | Travel: | Existing |
| 7. | Control: | PWM |
| 8. | Operation: | New MCE Microprocessor Group Automatic |
| 9. | Machine Location: | Overhead |
| 10. | Special Operations: | |
| | a. Independent Service | |
| | b. Fire Emergency Service | |
| | c. Standby Emergency Power | |
| | d. Anti-Nuisance Service | |
| | e. Basement Service | |
| | f. Tenant Security | |
| | g. Seismic Operation | |
| | h. Upward Ascending Motion Protection | |
| 11. | Door Operation: | Provide new |
| 12. | Door Protection: | Provide new |
| 13. | Guide Rails: | Retain |
| 14. | Guide Shoes: | Provide new |
| 15. | Hoist Ropes: | Provide new |
| 16. | Governor Ropes: | Provide new |
| 17. | Buffers: | Retain |
| 18. | Counterweights: | Retain |
| 19. | Safeties: | Retain |
| 20. | Governors: | Provide new |
| 21. | Car Frame & Platforms: | Retain |
| 22. | Compensation: | Retain |
| 23. | Machines: | Retain |
| 24. | Controllers: | Provide new |
| 25. | Motor Drive Units: | Provide new |

| | | |
|---|---|---|
| 26. | Car Operating Panels: | Provide new |
| 27. | Car Position Indicators: | Provide new |
| 28. | Service Cabinet: | Provide new |
| 29. | Communications: | Provide new |
| 30. | Hall Button Stations: | Provide new |
| 31. | Hall Lanterns: | Provide new |
| 32. | Guard Control Station: | Provide new |
| 33. | Life Safety Control Panel: | Provide new |
| 34. | Machine Room Monitor Panel: | Provide new |
| 35. | Handicap Requirements: | Provide new |
| 36. | Wiring: | Provide new |
| 37. | Car Enclosure: | Refurbish |
| 38. | Hoistway Entrances: | Retain |

39. Miscellaneous Items:
    a. Key Operated Hoistway Access
    b. Seismic Requirements
    c. Card Reader and CCTV Provisions
    d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car top, pit floor, and all existing metal work

B. Elevator No. 11- 13 Detention:

| | | |
|---|---|---|
| 1. | Type: | Gearless |
| 2. | Capacity: | 4000 Pounds |
| 3. | Speed: | 600 FPM |
| 4. | Stops: | No. 11-12: 5<br>No. 13: 14 |
| 5. | Openings: | No. 11-12 5 In Line<br>No. 13: 14 In Line |
| 6. | Travel: | Existing |
| 7. | Control: | PWM |
| 8. | Operation: | New MCE Microprocessor Simplex Selective Collective |
| 9. | Machine Location: | Overhead |

10. Special Operations:
    a. Independent Service
    b. Fire Emergency Service
    c. Standby Emergency Power
    d. Anti-Nuisance Service

e. Tenant Security
f. Upward Ascending Motion Protection
g. Seismic Operation
h. Detention Operation

| | | |
|---|---|---|
| 11. | Door Operation: | Provide new |
| 12. | Door Protection: | Provide new |
| 13. | Guide Rails: | Retain |
| 14. | Guide Shoes: | Provide new |
| 15. | Hoist Ropes: | Provide new |
| 16. | Governor Ropes: | Provide new |
| 17. | Buffers: | Retain |
| 18. | Counterweights: | Retain |
| 19. | Safeties: | Retain |
| 20. | Governors: | Provide new |
| 21. | Car Frame & Platforms: | Retain |
| 22. | Compensation: | Retain |
| 23. | Machines: | Retain |
| 24. | Controllers: | Provide new |
| 25. | Motor Drive Units: | Provide new |
| 26. | Car Operating Panels: | Provide new |
| 27. | Car Position Indicators: | Provide new |
| 28. | Hall Position Indicators: | Provide new in existing location @ 1 |
| 29. | Service Cabinet: | Provide new |
| 30. | Communications: | Provide new |
| 31. | Hall Button Stations: | Provide new |
| 32. | Hall Lanterns: | Provide new |
| 33. | Guard Control Station: | Provide new |
| 34. | Life Safety Control Panel: | Provide new |
| 35. | Machine Room Monitor Panel: | Provide new |
| 36. | Handicap Requirements: | Provide new |
| 37. | Wiring: | Provide new |
| 38. | Car Enclosure: | Refurbish |
| 39. | Hoistway Entrances: | Retain |

40. Miscellaneous Items:
    a. Key Operated Hoistway Access
    b. Seismic Requirements
    c. Card Reader & CCTV Provisions
    d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car

top, pit floor, and all existing metal work

C. Elevator No. 14-15 Service:

| | | |
|---|---|---|
| 1. | Type: | Gearless |
| 2. | Capacity: | 5000 Pounds |
| 3. | Speed: | 500 FPM |
| 4. | Stops: | 21 |
| 5. | Openings: | 21 In Line |
| 6. | Travel: | Existing |
| 7. | Control: | PWM |
| 8. | Operation: | New MCE Microprocessor Group Automatic |
| 9. | Machine Location: | Overhead |
| 10. | Special Operations: | |

a. Independent Service
b. Fire Emergency Service
c. Standby Emergency Power
d. Anti-Nuisance Service
e. Tenant Security
f. Upward Ascending Motion Protection
g. Seismic Operation
h. Swing Service

| | | |
|---|---|---|
| 11. | Door Operation: | Provide new |
| 12. | Door Protection: | Provide new |
| 13. | Guide Rails: | Retain |
| 14. | Guide Shoes: | Provide new |
| 15. | Hoist Ropes: | Provide new |
| 16. | Governor Ropes: | Provide new |
| 17. | Buffers: | Retain |
| 18. | Counterweights: | Retain |
| 19. | Safeties: | Retain |
| 20. | Governors: | Provide new |
| 21. | Car Frame & Platforms: | Retain |
| 22. | Compensation: | Retain |
| 23. | Machines: | Retain |
| 24. | Controllers: | Provide new |
| 25. | Motor Drive Units: | Provide new |
| 26. | Car Operating Panels: | Provide new |

| | | |
|---|---|---|
| 27. | Car Position Indicators: | Provide new |
| 28. | Hall Position Indicators: | None |
| 29. | Service Cabinet: | Provide new |
| 30. | Communications: | Provide new |
| 31. | Hall Button Stations: | Provide new |
| 32. | Hall Lanterns: | Provide new |
| 33. | Guard Control Station: | Provide new |
| 34. | Life Safety Control Panel: | Provide new |
| 35. | Machine Room Monitor Panel: | Provide new |
| 36. | Handicap Requirements: | Provide new |
| 37. | Wiring: | Provide new |
| 38. | Car Enclosure: | Refurbish |
| 39. | Hoistway Entrances: | Retain |
| 40. | Miscellaneous Items: | |
| | a. Key Operated Hoistway Access | |
| | b. Seismic Requirements | |
| | c. Card Reader & CCTV Provisions | |
| | d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car top, pit floor, and all existing metal work | |

D. Elevator No. 16-19 Judge:

| | | |
|---|---|---|
| 1. | Type: | Gearless |
| 2. | Capacity: | 3000 Pounds |
| 3. | Speed: | 500 FPM |
| 4. | Stops: | No. 16, 18, 19: 15 |
| | | No. 17: 14 |
| 5. | Openings: | No. 16, 18, 19: 15 In Line |
| | | No. 17: 14 In Line |
| 6. | Travel: | Existing |
| 7. | Control: | PWM |
| 8. | Operation: | New MCE Microprocessor Simplex Selective Collective |
| 9. | Machine Location: | Overhead |
| 10. | Special Operations: | |
| | a. Independent Service | |

b. Fire Emergency Service
c. Standby Emergency Power
d. Anti-Nuisance Service
e. Tenant Security
f. Upward Ascending Motion Protection
g. Seismic Operation

11. Door Operation: Provide new
12. Door Protection: Provide new
13. Guide Rails: Retain
14. Guide Shoes: Provide new
15. Hoist Ropes: Provide new
16. Governor Ropes: Provide new
17. Buffers: Retain
18. Counterweights: Retain
19. Safeties: Retain
20. Governors: Provide new
21. Car Frame & Platforms: Retain
22. Compensation: Retain
23. Machines: Retain
24. Controllers: Provide new
25. Motor Drive Units: Provide new
26. Car Operating Panels: Provide new
27. Car Position Indicators: Provide new
28. Hall Position Indicators: None
29. Service Cabinet: Provide new
30. Communications: Provide new
31. Hall Button Stations: Provide new
32. Hall Lanterns: Provide new
33. Guard Control Station: Provide new
34. Life Safety Control Panel: Provide new
35. Machine Room Monitor Panel: Provide new
36. Handicap Requirements: Provide new
37. Wiring: Provide new
38. Car Enclosure: Refurbish
39. Hoistway Entrances: Retain
40. Miscellaneous Items:
    a. Key Operated Hoistway

Access

b. Seismic Requirements
c. Card Reader & CCTV Provisions
d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car top, pit floor, and all existing metal work

E. Elevator No. 20 Kitchen:

| | | |
|---|---|---|
| 1. | Type: | Hydraulic Direct Plunger |
| 2. | Capacity: | 4000 Pounds |
| 3. | Speed: | 50 FPM |
| 4. | Stops: | 3 |
| 5. | Openings: | In Line |
| 6. | Travel: | Existing |
| 7. | Control: | Soft Start AC |
| 8. | Operation: | New MCE Microprocessor Simplex Selective Collective |
| 9. | Machine Location: | Adjacent |
| 10. | Special Operations: | |
| | a. Independent Service | |
| | b. Fire Emergency Service | |
| | c. Tenant Security | |
| | d. Battery Lowering | |
| 11. | Door Operation: | Provide new |
| 12. | Door Protection: | Provide new |
| 13. | Guide Rails: | Retain |
| 14. | Guide Shoes: | Provide new |
| 15. | Plunger Unit: | Provide new |
| 16. | Cylinder Unit: | Provide new |
| 17. | Buffers: | Retain |
| 18. | Car Frame & Platforms: | Retain |
| 19. | Power Unit: | Provide new |
| 20. | Controllers: | Provide new |
| 21. | Piping: | Provide new |
| 22. | Car Operating Panels: | Provide new |
| 23. | Car Position Indicators: | Provide new |
| 24. | Hall Position Indicators: | None |

25. Service Cabinet: Provide new
26. Communications: Provide new
27. Hall Button Stations: Provide new
28. Hall Lanterns: Provide new
29. Guard Control Station: Provide new
30. Life Safety Control Panel: Provide new
31. Handicap Requirements: Provide new
32. Wiring: Provide new
33. Car Enclosure: Refurbish
34. Hoistway Entrances: Retain
35. Miscellaneous Items:
    a. Key Operated Hoistway Access
    b. Seismic Requirements
    c. Card Reader Provisions
    d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car top, pit floor, and all existing metal work

F. Elevator No. 21 Shuttle:

1. Type: Geared
2. Capacity: 3500 Pounds
3. Speed: 100 FPM
4. Stops: 3
5. Openings: 3 In Line
6. Travel: Existing
7. Control: PWM
8. Operation: New MCE Microprocessor Simplex Collective
9. Machine Location: Adjacent Basement Application
10. Special Operations:
    a. Independent Service
    b. Fire Emergency Service
    c. Standby Emergency Power
    d. Anti-Nuisance Service
    e. Tenant Security
    f. Upward Ascending Motion Protection
    g. Seismic Operation
11. Door Operation: Provide new
12. Door Protection: Provide new
13. Guide Rails: Retain
14. Guide Shoes: Provide new

| | | |
|---|---|---|
| 15. | Hoist Ropes: | Provide new |
| 16. | Governor Ropes: | Provide new |
| 17. | Buffers: | Retain |
| 18. | Counterweights: | Retain |
| 19. | Safeties: | Retain |
| 20. | Governors: | Provide new |
| 21. | Car Frame & Platforms: | Retain |
| 22. | Compensation: | Retain |
| 23. | Machines: | Retain |
| 24. | Controllers: | Provide new |
| 25. | Motor Drive Units: | Provide new |
| 26. | Car Operating Panels: | Provide new |
| 27. | Car Position Indicators: | Provide new |
| 28. | Hall Position Indicators: | None |
| 29. | Service Cabinet: | Provide new |
| 30. | Communications: | Provide new |
| 31. | Hall Button Stations: | Provide new |
| 32. | Hall Lanterns: | Provide new |
| 33. | Guard Control Station: | Provide new |
| 34. | Life Safety Control Panel: | Provide new |
| 35. | Machine Room Monitor Panel: | Provide new |
| 36. | Handicap Requirements: | Provide new |
| 37. | Wiring: | Provide new |
| 38. | Car Enclosure: | Refurbish |
| 39. | Hoistway Entrances: | Retain |
| 40. | Miscellaneous Items: | |
| | a. Key Operated Hoistway Access | |
| | b. Seismic Requirements | |
| | c. Card Reader & CCTV Provisions | |
| | d. Clean hoistways, machine rooms, pits, and equipment; paint machine room floor, car top, pit floor, and all existing metal work | |

2.02 MATERIALS:

A. Aluminum: Alloy and temper best suited for anodizing finish specified.

B. Nickel silver: CDA Alloy 796, leaded nickel silver.

C. Plywood: PS-1, A-D exterior Grade Douglas Fir, fire retardant treated.

D. Sheet steel: ASTM A366, uncoated, pickled, free from defects.

E. Sound deadener: Fire retardant; spray, roller or adhesive applied; 3/16 inch thick.

F. Stainless steel: ASTM A167; type 302 or 304.

## 2.03 FINISHES:

A. Exposed-to-view surfaces:

1. Provide as follows unless otherwise specified.
   a. Aluminum: Clear anodized finish.
   b. Sheet steel:
      1) Shop prime: Degrease clean of foreign substances and apply one coat of corrosion inhibiting primer compatible with finish paint selected. Hoistway items visible to public shall be painted one additional coat of black paint.
      2) Finish paint: Three coats baked enamel; sand each coat smooth; color as selected.
   c. Stainless steel:
      1) Plain: Satin, directional polish, No. 4 finish unless otherwise specified.
      2) Patterned: Rigidized Metal's No. 5 WL, Ardmore Textured Metals No. 5-SM or equal.
   d. Touch-up:
      1) Prime surfaces: Use same paint as factory for field touch-up.
      2) Finish painted surfaces: Refinish whole panel with shop prime and finish paint as specified above.

B. Non-exposed-to-view surfaces:

1. Degrease and shop paint manufacturer's standard corrosion inhibiting primer.

## 2.04 AUTOMATIC OPERATION:

A. General operation of individual elevators:

1. Provide a MCE iBox or approved equal non-proprietary diagnostic microprocessor-controlled dispatching and car control system, based on real time calculations, designed to monitor all types of traffic and sufficiently flexible so that it can be modified to accommodate changes in traffic patterns.

2. Serial link communications: Provide a distributed processing network consisting of localized processors located in machine rooms, car stations, hall stations and top of car to allow system to make fast decisions based on data shared by the processor involved in the different operations of the elevators. For group dispatch operations, all elevators in the group shall be capable of acting as a group common dispatcher as the need arises.

3. Fault diagnostic system: Provide Owner’s Representative with all hardware such as on-board LED. diagnostics, hand held device or laptop computer, as standard with manufacturer, and supporting software documentation. Diagnostic system shall be capable of determining faults most difficult to find, as well as be capable of performing all code required testing.

4. The system shall be flexible, irrespective of the number of elevators in normal service.

B. Destination Information Dispatch Group Operation Nos. 1-10:

1. Provide variable algorithm based control system with remote keypad/intuitive touch screen at entrance(s) to building location as selected by Owners Representative, upon passenger entering floor selection onto keypad/touch screen system shall via integral display instantly indicate elevator ( A-B-C-D, 1-2-3-4, etc ) designated for each passenger upon registering of selected floor destination.
2. Provide call correction in the event of misuse, abuse or neglect, a single passenger places numerous calls or fails to enter elevator designated, elevator car load weigher's shall detect weight of passenger and correct automatically. In the event there is a single call place and numerous passengers enter elevator, system shall monitor and allow for making corrections automatically in algorithm based logic.
3. Early car announcement shall not exceed 10 seconds if implemented.
4. Upon entering elevator passenger shall note their destination floor is illuminated on floor indicator destination panel, upon arrival at destination floor, floor number on indicator destination panel flashes to confirm their arrival.
5. Remote keypad/intuitive touch screen shall employ an international wheelchair symbol to activate special features for people with special needs. Upon activation of wheelchair symbol, provide both visual and/or audible responses. Provide that the elevator assigned to persons with special needs will have fewer passengers to allow extra room in elevator cab. Provide extended door open time to allow passenger extra time to enter and exit elevator. Provide audible tones and/or voice communication to indicate elevator assigned, elevator location, status of doors and arrival at destination floor to assist special need passengers throughout their journey.
6. Dispatching system shall group passengers to elevator(s) by their common input selected destination floor information. Call allocation dispatching system shall minimize the amount of stops performed by elevator.
7. System shall constantly and continuously monitor passenger demand to implement the most effective dispatching method at any given moment. System shall constantly assess real-time passenger origin via ETD (Estimated Time to Destination) and destination data to dynamically assign passenger(s) to respective elevators.
8. Dispatching system shall be flexible to changing passenger traffic patterns throughout the day. Make internal diagnosis via variable algorithm and corrections to account for changing traffic patterns during normal day. System maintains flexibility to adjust to "UP PEAK" in mornings, "TWO WAY", during lunchtime and "DN PEAK" at evenings so passengers benefit from reduced wait times, fewer stops per trip throughout entire day.
    a. UP PEAK, assumes 100% of traffic is traveling up the building form the main entrance floor.
    b. TWO-WAY, assumes 40% traveling up, 40% traveling down and 20% traveling between intermediate floors.
    c. DN PEAK, assumes 100% of traffic is traveling down the building to the main entrance floor.
9. ETD algorithm shall apply a common approach to both conventional up/down hall calls, and destination calls, allowing both to be used in the same system. Intermediate hall calls shall be calculated with corresponding car calls. Hall call shall be interfered or assigned as a car call to eliminate SDF (System Degradation Factor). As hall call ages it shall receive additional priority to eliminate long wait calls.
10. Provide concealed (COP) car operating panel.
11. Provide accessible (COP) car operating panel.
12. Provide accessibility for fully integrating system into existing or planned security system at Owners Representative direction.

13. Provide selection of floor selection destination input devices to Owners Representative, but not limited to keypad, intuitive screen, security card swipe, PIN number registration, special keys and hands free radio tag devices.

14. **SPECIAL NOTE**: It has been found by Siikonen (2000) and Barney (2002) that reduction of elevators, reduction in elevator capacity and speed, based on enhanced performance of destination dispatch type control systems is likely to cause problems with performance at other times, particularly during lunchtime and evening periods. Destination Dispatch shall not be used to reduce the amount of elevators used, all analysis shall be performed using standard UP PEAK conditions. This system will only enhance the UP PEAK condition.

    a. In has been found, in traffic scenarios where grouping is minimal, a system with destination input offers no meaningful improvements over conventional systems.

C. Group automatic operation; for two or more cars:

1. Provide an "on-demand" hall call response system that will continuously scan the hall calls and assign the closest elevator in time to respond to that call. The system shall be capable of reassigning the elevator if demand changes the real time calculation.

2. A car with no car calls registered arriving at a floor where both "up" and "down" hall calls are registered shall respond to the hall call in the direction of travel and illuminate the appropriate lantern. If no car call is registered for that direction, the lantern shall be extinguished, the lantern for the other direction shall light and the car shall respond to the call in that direction. The doors shall not close and reopen.

3. The system shall be capable of monitoring hall and car calls to monitor coincidental calls. The cars will continuously scan the whole system to determine the closest elevator in time taking into account the coincidental car and hall call.

4. Other required features:

    a. Should a car be delayed from leaving a floor for any reason, other cars shall respond to the hall calls at that floor and shall be dispatched in a normal manner.

    b. Provide each car with an adjustable load-weighing device, which will immediately dispatch cars and bypass hall calls when car is loaded to predetermined load.

5. General program adjustments:

    a. After each group of elevators have been placed in regular service and the building substantially occupied, the elevators shall be regularly observed under normal operating conditions and minor adjustments shall be made as found necessary to ensure that the elevators operate at maximum efficiency.

    b. If zones are employed, arrangements shall be made in the control circuits of the elevators for the division between each zone to be raised or lowered if found necessary due to uneven distribution of traffic between the zones and/or staffing requirements.

D. Simplex selective collective operation:

1. Arrange for simplex selective collective automatic operation. Operate elevators from a single riser of landing buttons and from operating device in car.

2. Momentary pressure of one or more car or landing buttons, other than those for landing at which car is standing, starts car, and causes car to stop at first landing for which a car or landing call is registered corresponding to direction in which car is traveling. Stops made in order in which landings are reached, irrespective of sequence in which calls are registered.

3. Double door operation not permitted. If an up traveling car has a passenger for an intermediate floor and a down call is registered at that floor, with no calls above car, it travels to floor, opens door to let passenger out, then lights down direction arrow in hall lantern and accepts waiting passenger without closing and reopening doors.

## 2.05 SPECIAL OPERATIONS:

A. Inspection operation:

1. Provide key-operated hoistway access device and car top operating device. Key switches shall be mounted in existing locations at terminal landings.

B. Independent service:

1. Independent service operation shall be provided so that, by means of a switch located in the car service cabinet, the car can be removed from automatic operation and be operated by an attendant. The attendant shall have full control of the starting, stopping and direction of car travel.

2. The car shall respond to car buttons only. The hall signals for the car on independent service shall not operate.

C. Anti-nuisance: (TRACTION ELEVATORS ONLY)

1. Provide "anti-nuisance service" whereby all car calls will be cancelled if the load-weighing device detects that an abnormal number of calls are registered given the number of passengers in the car.

2. System using false call answering to accomplish this is not acceptable.

D. Operation under fire or other emergency conditions:

1. Provide special emergency service to comply with ASME A17.1, CCR Title 8, IBC and local codes having jurisdiction.

2. Provide Phase 1 recall switch at main floor elevator lobby and fire control life safety room. Interlock recall switches to prevent simultaneous activation.

3. Key switches at main floor shall be integrated in hall button station with engraved instructions.

E. Operation under earthquake conditions:

1. Provide seismic operation in accordance with CCR Title 8 ASME A17.1.

2. Provide a dual ring and string, continuously monitoring type counterweight displacement device for each counterweight with rings mounted on each corner of frame.

3. Provide a seismic switch device measuring both horizontal and vertical accelerations for each group of elevators located per manufacturer's recommendations.

F. Operation under standby/emergency power system:

1. General: The standby power system is sized to operate one elevator in each group simultaneously. Elevators shall be grouped as follows:

a. Group 1 = Elevators No. 1-10.

b. Group 2 = Elevators No. 11.

c. Group 3 = Elevators No. 12.

d. Group 4 = Elevators No. 13.

e. Group 5 = Elevators No. 14-15.

f. Group 6 = Elevators No. 16.

g. Group 7 = Elevators No. 17.

h. Group 8 = Elevators No. 18.

i. Group 9 = Elevators No. 19.

j. Group 10 = Elevators No. 21.

2. When normal power fails and standby power becomes available, a signal will be given to the controllers, all elevators will shut down, and all car lights, etc., will be extinguished.

3. When emergency power comes onto the line, power for lighting car fan and alarm bell shall be automatically transferred and all cars on automatic operation shall be sequentially returned one at a time from each group, to the main floor.

4. After all cars are parked at main floor, one car of each group shall resume normal operation.

5. Provide interlocking illuminated strip switches or keyed rotary switch to permit manual or automatic selection of desired elevator to operate on emergency power.

6. When normal power fails and emergency power is used, or when normal power is restored, the elevator manufacturer shall provide all circuitry necessary, including time delay or auxiliary relays required to accomplish safe, continuous elevator operation. The cars will start in sequence, not simultaneously; allow 10 seconds between starts.

7. Fire service and derailment devices shall be operable when system is on emergency power operation.

G. Tenant security:

1. Arrange control system to enable and disable car call buttons as follows:

a. Function, which locks out all cars in a group so that all car and corridor buttons are inoperative, except the main floor.

b. Function which locks out any selected car button for all elevators in a group serving that floor.

c. Tenant security operations can be overridden by cars on independent, any special emergency service or by card reader access.

H. Swing service operation; Elevator no. 14-15:

1. Provide a key switch with pilot light in guard control station.

2. Activation of switch removes car from group operation and places it on simplex selective collective operation, controlled by normal car buttons and a separate inconspicuous riser of hall buttons.

3. Swing service operation shall not effect cars on independent or fire emergency service.

4. LCD and keyboard function to accomplish the above will be acceptable.

5. Provide key switch in each inconspicuous riser station to allow operation of the buttons.

## 2.06 DOOR OPERATION:

A. Passenger type; Horizontal sliding:

1. Provide door times available as specified under "Design Criteria."

2. Car and hoistway doors shall open and close simultaneously, quietly and smoothly; door movement shall be cushioned at both limits of travel. Door operation shall not cause cars to move appreciably.

3. Door hold open times shall be readily and independently adjustable when car stops for a car or hall call. Main floor door hold times shall be adjustable independent of other floors.

B. Door operator:

1. Provide new heavy-duty master type operator mounted on car enclosure utilizing minimum 12-guage support angles to isolate from direct mounting of operator on the car top.

2. Pre-approved closed loop door operators:

a. ThyssenKrupp HD-04
b. GAL MOVFR

C. Door Protection:

1. Remove existing door protection devices and provide new electronic optical scanning type:
   a. Provide a door protective system which does not rely on physical contact with a person or object to inhibit door movement or initiate door reversal.
   b. Pre-approved optical door sensors:
      1) Adams GateKeeper ICU.
      2) Janus Pana80 Plus.
      3) Otis Lambda.
      4) Tritronics LeadingEdge.
      5) TL Jones Microscan.
   c. The system shall be able to detect a 2 inch diameter rod introduced at any position within the door movement and between the height of 2 inches and 63 inches above sill level.
   d. Detection of intrusion into the protected area shall cause the doors, if fully open, to be held in the open position and, if closing, to reverse to fully open position.
   e. If doors are prevented from closing for an adjustable period of 15 to 45 seconds or upon activation of fire emergency service, they shall proceed to close at reduced speed and a loud buzzer shall sound. Door closing force shall not exceed 2-1/2 ft.-lb when door re-opening device is not in operation.
   f. For side-opening doors, the detector for the strike jamb side shall be recessed, flush with strike jamb.

D. Door hold button; Elevator No. 11-15. 20-21:

1. Provide an illuminated door hold button, operation of which will hold the doors open for a predetermined and adjustable period of 20 to 90 seconds. Sound warning buzzer 5 seconds prior to expiration of time. Normal operation shall be resumed upon:
   a. Expiration of door hold time.
   b. Operation of door close button in car.
   c. Operation of any floor button in car.

## 2.07 SIGNALS AND OPERATING FIXTURES:

A. General:

1. Provide signals and fixtures as shown and specified. Location and arrangement of fixtures shall comply with disabled access requirements.
   a. Buttons Nos. 16-19: Provide minimum 1 inch diameter mechanical, white illuminated halo style buttons raised 1/8 inch from surrounding surface with square shoulders and with 5/8" engraved identifications. Operation of car or hall button shall cause button to illuminate. Response of car to car or hall call shall cause corresponding button to extinguish.
   b. Buttons Nos. 1-10, 11-15, 20-21: Provide vandal-resistant stainless steel minimum 1 inch diameter mechanical, buttons, raised 1/8 inch from surrounding surface with square shoulders and integral illumination equal to Adams, EPCO, ERM, or INNOVATION fixtures. Operation of car or hall button shall cause button to illuminate. Response of car to car or hall call shall cause corresponding button to extinguish.
   c. Switches: Toggle type typically or key operated where noted.
   d. Key switches: Some special security key switch tumblers will be provided by the Courts for installation during the manufacturing of the fixtures.

e. Faceplates: Provide of material and finish as indicated and specified; 1/8 inch minimum thickness with sharp edges relieved. Faceplates shall be sized to cover holes left by removal of existing fixtures where new fixtures are provided and provided with engraved fire sign, per A17.1.

f. Fastenings: Provide with flush tamper-proof screws of material and finish matching faceplates.

g. Cabinets: Provide with pulls, concealed hinges and doors mounted flush with hairline joints to adjacent surface.

h. Arrangement: Arrangement of fixtures shall generally conform to that specified, but components may be rearranged after review of submittal.

i. Engraving: Of size indicated; color backfill with epoxy paint in contrasting color as selected.

j. Lamps: Miniature LED type.

k. Audible chimes: Electronic adjustable audible chimes from 75 to 85 dBA in elevator lobby 3'-0" above floor and 3'-0" away form elevator entrance; bell type gong not acceptable.

l. Provide floor passing signal of the adjustable electronic audible chime type.

m. Tactile markings: Provide raised Braille and alpha characters, numerals or symbols to the left of operating buttons and devices used by the public. Indications may be engraved directly on faceplates or separate plates flush mounted with hairline joints and concealed mechanical fasteners. Plates shall be of same size and shape as buttons. Raised characters shall be white on a black background with Braille designation directly below the character.

B. Car operating panels:

1. General: Provide buttons numbered to conform to floors served and the following:

a. Locate top operating button at 48 inches above floor; maximum 54 inches when required.

b. Locate emergency stop switch and illuminated alarm button in bottom row at 35 inches above floor.

c. Provide "Door Open", "Door Close", and "Door Hold" buttons located above emergency stop and alarm of same design as car button.

d. Engrave main panel with capacity, number of passengers and elevator number in 1/4-inch letters. Engrave auxiliary panel with NO SMOKING in 1/2 inch letters. All other signage required by local codes shall be engraved as directed by Owner's representative.

e. Provide fire emergency panel above floor buttons containing phase II fire key switch, call cancel button stop switch, door open, door close buttons and audible/visual signals.

f. Make provisions for card readers and CCTV.

2. Elevator No. 1-10, 20-21: Provide two new panels per car; integrate cabinets, buttons and engraving into hinged single piece faceplate mounted to front return panel side wall adjacent to strike jamb.

3. Elevator No. 11-19: Provide one new panel per car; integrate cabinets, buttons and engraving into hinged single piece faceplate mounted in existing location.

C. Car position indicators:

1. Provide car position indicators with indications corresponding to floor designations with matching direction arrows.

a. Provide new digital alpha numeric type segmented LED or fluorescent readout indicator with minimum two-inch high indications mounted integral with each car operating panel.

D. Hall position indicators:

1. Provide with indications corresponding to floor designations with matching direction arrows.
    a. Elevator No. 1-13: Provide new digital alphanumeric type segmented LED or fluorescent readout indicator with minimum two-inch high indications. Combine with hall lantern.

E. Service cabinet:

1. Provide new cabinet, door with a lock and concealed hinge as an integral part of car operating panel mounted with flush hairline joints. Cabinet door shall be provided with a flush glazed window of required size to hold elevator-operating permit. Service cabinet shall contain the following:
    a. Independent service switch.
    b. Two-speed ventilation switch (Hi-Off-Low).
    c. Light switch.
    d. Inspection switch, key operated.
    e. Duplex GFI convenience outlet.
    f. Buzzers as required.
    g. Constant pressure test switch for emergency car lighting.
    h. Card reader over-ride switch-key operated.

F. Communication equipment:

1. Provide a new complete communication system in compliance with ADA regulations consisting of a combination speaker/microphone, amplifier, automatic dialer with 4 number rollover capability and matching car station push button with telephone symbol to activate system and acknowledgment lights. Mount in car operating panel behind a pattern of holes, wire to machine room and program automatic dialer as directed by Owner's Representative.
2. Building emergency personnel communication system (for travels over 60'): Provide a two-way voice communication system in accordance with ASME A17.1. The two-way voice communication system outside of the car shall be located within the guard station control panel.

G. Hall button fixtures:

1. Each fixture shall contain buttons, which light to indicate hall call registration and extinguish when call is answered. Provide intermediate fixtures with two buttons and terminal fixtures with one. Engrave fire-exiting instructions on faceplates. Provide minimum of two fasteners at top and bottom of faceplate.
    a. Elevator No. 1-10: Provide elevator group with four risers of hall button stations.
    b. Elevator No. 11-21: Provide each elevator group of elevators with one riser of hall stations.
    c. Elevator No. 14-15: Provide an inconspicuous riser mounted in hoistway entrance jamb having key switch or card reader operated up and down illuminated buttons with faceplates matching finish of entrance frames.

H. Hall lanterns:

1. Provide new faceplates and provide new single chime for up and double chime for down direction. Lantern illuminates white for up and red for down. As car approaches floor, lantern shall illuminate and chime approximately 4 seconds prior to doors opening to indicate next direction of travel. Chime shall be at least 85 dBA in Corridor.

I. Hall lanterns No. 1-15, 20-21:

1. Provide dual vandal resistant hall lanterns.

J. Remote control stations:

1. Provide new indicator and control panels with wiring from elevator hoistways to and between remote stations as specified.
2. Engrave operating instructions for controls, indicators, elevator numbers and floors served by each elevator or group of elevators.
3. Provide all conduit runs as needed.
4. Manufacturer's Elevator Monitoring System utilizing LCD device and keyboard is preferred providing all features specified can be incorporated.

K. Provide new indicator and control panels as follows:

1. Marshall's Security control station at floor "S" Nos. 1-21: Provide with a stainless steel faceplate and rough in electrical box to be wall or desk type computer monitoring system with a 17" flat screen monitor with keyboard and printer mounted in the console. Locate as directed. Include the following devices for each elevator or group of elevators as applicable.
   a. Digital LED or fluorescent readouts with direction arrows indicating location and direction of travel of each elevator.
   b. Switch and pilot light to call and shut down each car at lobby with doors closed. Pilot light to illuminate when car is in service.
   c. Independent service switch and pilot light for each car to call car to lobby and park with doors open. Pilot light to illuminate when car is on independent service.
   d. Tenant security switches as specified under special operations.
   e. Swing service switches as specified under special operations.
   f. Remote detention car pushbutton touch screen panel for Nos. 11-13 to provide full control of detention elevators.
2. Life safety control station in main lobby; Elevator No. 1-21: Locate in existing location. Size panel to suit space available; design as approved. Include the following for each elevator or group of elevators as applicable:
   a. Digital LED or fluorescent readouts with direction arrows indicating location and direction of travel of each elevator.
   b. Three-position fire key switch with visual indication.
   c. A pilot light marked STANDBY OR EMERGENCY POWER in 1/4 inch letters, and illuminating manual selection switches for each car, indicating which car is operating on standby (emergency) power. The sign shall light as soon as main power fails and each jewel shall remain illuminated as long as its car is operating on emergency power. When normal power is resumed, all lights shall be extinguished automatically.
   d. A compartment containing properly identified keys to operate all fire service switches. Provide tags with legible instructions on each key. Lock on compartment shall be subject to house master key or fire department key as approved.

L. Disabled access requirements:

1. Provide to meet local codes having jurisdiction including handrail and button configuration.
   a. Car operating panels: Provide raised Braille and alpha characters, numerals or symbols to the left of operating buttons and devices used by the public. Indications may be engraved directly on faceplates or separate plates flush mounted with hairline joints and concealed mechanical fasteners. Plates shall be of same size and shape as buttons. Raised characters shall be white on a black background with Braille designations directly below the character. Provide "star" at main egress landing.
   b. Entrances: Provide raised Braille and alpha characters, numerals or symbols similar to those for car stations of size required by governing authority. Locate on each entrance jamb at 60 inches above floor indicating floor designation. Material and finish of plates

shall match hall button station faceplates. Provide with contrasting background and mounting means similar to those on car panels. Braille designation shall be to the left of the raised character. Provide "star" at main egress landing.

c. Provide voice floor announcement in each elevator with adjustable sound levels.

## 2.08 WIRING:

A. General:

1. Provide all necessary wiring and 20% spares between cars and controllers and to all remote control stations; minimum of four. Furnish shielded wires in cables for all communications card readers and speakers. Include six additional pairs of shielded spares and two RG-6 coaxial cables for each car.

2. Interface Junction Box:

a. Provide a common interface junction box in each machine room with the following terminal blocks for each elevator.

1) Telephone
2) Standby Power transfer switch contacts
3) Fire alarm relay outputs
4) Card reader inputs per floor
5) Fire phone jacks
6) Fire paging speakers
7) CCTV

B. Traveling Cables:

1. Use minimum number of "ET" rated traveling cables with flame retarding and moisture resisting covers. Include shielded wires and spares as noted above. Cord thoroughly and protect cables from rubbing against hoistways or car items. Provide with steel cable core and properly anchored to relieve strain on individual conductors.

C. Work light and GFI convenience outlet:

1. Provide on top of car with wire lamp guard.

D. Stop switch:

1. Provide in each pit and on top of car.

E. Alarm gong:

1. Six-inch size, 110 volt.

2. Provide on top of each car and one per group inside of hoistway at main landing to be actuated by corresponding alarm button or emergency stop switch.

F. Auxiliary disconnect switches:

1. Provide as required in remote controller rooms or at remote equipment not in view of mainline switches; include all wiring and conduit.

G. Coaxial circuit:

1. Provide for closed circuit television camera in elevators. Run from elevator car to machine room junction box.

## 2.09 CAR ENCLOSURES:

A. General:

1. Fabricate finish work smooth and free from warps, buckles, squeaks and rattles; joints lightproof. Car shall be sound isolated from car frame. No visible fastenings except as indicated.

2. All elevators shall be weighed before work begins to determine actual weight of car enclosures. Contractor shall keep a log of all equipment and weight removed and added to the suspension system. Contractor is responsible for complying with CCR Title 8 Section 3000(h) (Major Alterations).

B. Emergency lighting; All elevators:

1. Provide an emergency car lighting unit mounted on top of car, battery driven and self-rechargeable. Upon outage of normal power the unit shall, within 5 seconds, light two lamps as part of normal car lighting or separate lights mounted above drop ceiling. The unit shall have sufficient capacity to keep the lights in continuous operation for four hours and also the alarm bell for one hour. Provide a readily accessible means for testing the unit in service cabinet. Light fixtures mounted in car front returns or operating panels are not acceptable.

C. Elevator No. 1-6: Retain existing shell enclosure and rehabilitate as follows:

| | | |
|---|---|---|
| 1. | Front returns: | Clad |
| 2. | Car operating panels: | Provide new, match existing finish |
| 3. | Wall panels: | Provide new clad with 5 WL architectural metal and stainless steel revels |
| 4. | Transom | Clad, match existing finish |
| 5. | Hand rails: | Provide new ADA Compliant |
| 6. | Ceiling and lighting: | Provide new island type clad with No. 4 stainless steel with 6 LED down lights |
| 7. | Ventilation | Provide new Two-speed squirrel cage exhaust blower (Morrison AA or equal) with sound isolation mounting on canopy. |
| 8. | Emergency exit: | Retain Provide code compliant micro-switch |
| 9. | Car Doors | Provide new, match existing finish |
| 10. | Finish flooring | Provide new vinyl tile |
| 11. | Protective pads | Provide new |

D. Elevator No. 7, 9 & 11: Retain existing shell enclosure and rehabilitate as follows:

| | | |
|---|---|---|
| 1. | Front returns: | Clad 5 WL |
| 2. | Car operating panels: | Provide new, |
| 3. | Wall panels: | Provide new clad with 5 WL architectural metal and stainless steel revels |
| 4. | Transom | Clad 5 WL |
| 5. | Hand rails: | Provide new ADA Compliant |
| 6. | Lighting: | Provide new flush mounted detention lighting |
| 7. | Ventilation | Provide new Two-speed squirrel cage exhaust blower (Morrison AA or equal) with sound isolation mounting on canopy. |
| 8. | Emergency exit: | Retain Provide code compliant micro-switch |

| | | |
|---|---|---|
| 9. | Car Doors | Provide new 5WL |
| 10. | Finish flooring | Provide new aluminum diamond decking |

E. Elevator No. 8 & 10: Retain existing shell enclosure and rehabilitate as follows:

| | | |
|---|---|---|
| 1. | Front returns: | Clad No. 4 |
| 2. | Car operating panels: | Provide new, match existing finish |
| 3. | Wall panels: | Provide new clad with 5 WL architectural metal and stainless steel revels |
| 4. | Transom | Clad No. 4 |
| 5. | Hand rails: | Provide new ADA Compliant |
| 6. | Ceiling and lighting: | Provide new island type clad with No. 4 stainless steel with 6 LED down lights |
| 7. | Ventilation | Provide new Two-speed squirrel cage exhaust blower (Morrison AA or equal) with sound isolation mounting on canopy. |
| 8. | Emergency exit: | Retain Provide code compliant micro-switch |
| 9. | Car Doors | Provide new No. 4 |
| 10. | Finish flooring | Provide new vinyl tile as selected |
| 11. | Protective pads | Provide new |

## 2.10 HOISTWAY ENTRANCES:

A. General:

1. Retain existing or provide new as specified.
2. Fabricate finish work smooth with flush surfaces and free from warps and buckles.
3. New entrance assemblies shall bear 1-1/2 hour U.L. rating.
4. Provide entrances of size and type as scheduled.

B. Hangers and Tracks:

1. Provide all new door tracks and hanger assemblies. Sheave type with two-point suspension. Steel sheaves with flanged groove and resilient sound-absorbing tires. Minimum 2-1/2 inch diameter for hoistway, 3 inch for car. Manufacturer's heavy-duty tracks and ball or roller bearing with adjustable up thrusts.

C. Closers:

1. Provide new cable relating torsion spring mechanical type or broken arm jack knife type as required for door assembly. Counter-weighted closers are acceptable if mounted to strut.

D. Dust and hanger covers:

1. Retain existing, clean and refinish with black paint. Replace any missing covers.

E. Fascia, toe and head guards:

1. Retain existing, modify to comply with code, refinish with black paint and refasten for greater rigidity. Replace any missing fascia or guards.

F. Interlocks:

1. Provide all new. Equip each hoistway door with a tamper-proof interlock which shall prevent operation of the car until doors are locked in the close position as defined by the Code and shall prevent opening of doors at landing from corridor side unless car is at rest at landing in leveling zone or, hoistway access switch is used. Provide all new type “SF” high temperature wiring for interlock circuits.

G. Pick-up roller assemblies:

1. Provide all new pick-up roller assemblies as required for door operating equipment furnished.

H. Sills:

1. Retain existing, power clean to metal and refinish.

I. Limit Switches:

1. Retain existing, clean contacts and replace as required.

J. Frames:

1. Retain existing. Clean and refinish as scheduled. Frames to be refinished by others.

K. Hoistway doors:

1. Retain existing, re-hang to remove all twists, provide two new guides per panel which will remain engaged in sill if guiding member is destroyed. Provide new full height astragals and non vision wings matching finish of door panels. Contractor must use the original reinforcing on existing hoistway and car doors for mounting hangers, pickup rollers, drive vanes, etc. If original reinforcing is not reusable for drive vanes and pickup rollers, Contractor shall furnish new reinforcing (minimum of 1/4" thick plate) welded to the door face. A minimum of four (4) 5/16” threaded bolts is to be used for attachment to the reinforcing plate. Where slotted holes are provided in the attachment block, a 1/4" dowel pin is to be fitted after doors locks are set up. Door panels to be refinished by others.

L. Passenger Elevator Entrance Schedule:

1. Elevator No. 1-10:
   a. Size: 3’-6” wide by 7’-0” high.
   b. Type: Center Single speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish
2. Elevator No. 11-13:
   a. Size: 4’-4” wide by 7’-0” high.
   b. Type: Center Two speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish
3. Elevator No. 14-15:
   a. Size: 4’-6” wide by 7’-0” high.
   b. Type: Side Two speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish

4. Elevator No. 16-19:
   a. Size: 3’-6” wide by 7’-0” high.
   b. Type: Center Single speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish
5. Elevator No. 20:
   a. Size: 5’-1” wide by 7’-0” high.
   b. Type: Side Two speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish
6. Elevator No. 21:
   a. Size: 3’-6” wide by 7’-0” high.
   b. Type: Center Single speed
   c. Frames: Refinish by others
   d. Doors: Refinish by others
   e. Sills: Refinish

## 2.11 TRACTION ELEVATOR EQUIPMENT:

A. Design criteria:
   1. Pre-approved products:
      a. Motion Control Engineering iBOX
   2. Performance:
      a. Contract speed: Maximum three percent (3%) speed variation under any loading condition in either direction.
      b. Motion time: Start of motion to stop of motion as measured in both directions for a typical one floor run under any loading condition. After make-up of hoistway door interlock, initiate movement of car within 0.2 second. Typical floor height of 14’-6” is assumed.
         1) Elevator No. 1-19: 5.0 seconds
         2) Elevator No. 20: 20.0 seconds
         3) Elevator No. 21: 10.7
      c. Door Open Times:
         1) Elevator No. 1-10, 16-19, 21: 1.6 seconds
         2) Elevator No. 11-13: 2.0 seconds
         3) Elevator No. 14-15: 2.7 seconds
         4) Elevator No. 20: 3.0 seconds
      d. Door close times: Minimum, without exceeding kinetic energy and closing force, allowed by code.

e. Door dwell times: Comply with A.D.A. formula and provide separate adjustable timers with initial settings as follows:
   1) Main lobby hall call: 6.0 to 8.0 seconds.
   2) Upper lobby hall call: 6.0 to 8.0 seconds.
   3) Car call: 5.0 to 6.0 seconds.
   4) Interruption of door protective device: Reduce dwell to 0 seconds.

f. Leveling: Within 1/4 inch under any loading condition. Level into floor at all times, do not overrun floor and level back.

g. Re-leveling: Provide smooth and accurate re-leveling required due to cable stretch.

3. Operating qualities: Architect and Owner's Representative will judge riding qualities of cars and enforce the following requirements. Make all necessary adjustments.
   a. Acceleration and deceleration: Starting and stopping shall be smooth and comfortable, without obvious steps of acceleration. Slowdown, stopping and leveling shall be without jars or bumps. Stopping upon operation of emergency stop switch shall be rapid but not violent.
      1) Vertical Acceleration: Maximum 4 $Fps^2$. Maximum jerk 8 $Fps^3$.
      2) Horizontal Acceleration (ISO A95 Scaling): Maximum 15 mg peak-to-peak measured at full speed for full travel in both directions.
      3) Vertical Vibration: Ride shall be free of vibration throughout acceleration, full speed and deceleration for full travel in both directions.
   b. Full Speed Riding: No more than 20 mg peak-to-peak (ISO A95 Scaling).

4. Motor control:
   a. Equipment: Capable of operating at plus or minus ten percent of normal feeder voltage and plus or minus three percent of feeder frequency without damage or interruption of elevator service.
   b. Control system: Digital closed loop feedback control incorporating positional and velocity selector system that is capable of operating continuously at contract speed and load for one hour without exceeding 50 degrees Centigrade from ambient machine room temperature. Design system to not adversely affect stability of voltage and frequency controls of standby generator set or loads connected to power bus during standby power operation.
   c. Car load sensing:
      1) The control system shall sense the actual load condition of the elevator prior to any movement of the elevators. The start/acceleration pattern shall be adjusted to reflect the car load to achieve a smooth start/acceleration under all load conditions and location in the hoistway.
      2) Provide load sensing devices that utilize crosshead deflection or hoist rope pressure. System shall be accurate within 100 pounds and stable over extended periods.
      3) Systems using pre-torquing of the D.C. motor armature are acceptable; variable voltage control of the brake energization is not acceptable.

5. Sound control:
   a. Vibration: Sound isolate machines and motor drives from beams and building structure to prevent objectionable noise and vibration transmission to occupied building spaces.
   b. Airborne noise: Maximum acoustical output level of:
      1) 75 dBA measured in machine room.
      2) 60 dBA measured in elevator cars during all sequences of operation.

3) 50 dBA measured in elevator lobbies.

## 2.12 HOISTWAY EQUIPMENT:

A. Guide rails and brackets:

1. Retain existing car and counterweight rails, realign, clean, check, tighten and replace Code non-complying brackets, fishplates and bolts. Provide log of the alignment corrections to the Owner's Representative.

B. Guide shoes:

1. Provide new guide shoes for car and counterweight of the roller type with neoprene or rubber composition tires, minimum 3/4 inch wide and fully adjustable spring loaded to provide continuous contact with rail surfaces. Balance car to insure equal guide shoe pressure on all wheels and not exceed manufacturer's recommendations. Nominal roller diameter shall be 6 inches for car and 3 inches for counterweight. Provide seismic retainer plates as required.

C. Hoist ropes:

1. Provide new of size and type to suit equipment manufacturer's specifications.
2. Tension hoist ropes so that all rope tensions are within a 10 lbs. range.

D. Governor ropes:

1. Provide new of size and type to suit governor and safeties manufacturer's specifications.

E. Buffers:

1. Retain existing oil buffers. Renew existing springs, seals, valves and clean ram, readjust to car buffer plates, drain and flush out all oil tanks, clean down, replace seals as necessary, refill and test with full load at contract speed.

F. Counterweights:

1. Retain existing, realign, correct balance, clean down and tighten frame bolts.
   a. Provide retainer plates to meet seismic code requirements.
   b. Secure weight to provide noise free operation at full speed in both directions.

G. Safeties:

1. Retain. Strip down completely, clean, replace operating jaws, arms and springs and reassemble. Test its operation with governor device.

H. Governor:

1. Provide new.
   a. Provide new governor device that is compatible with safety gear with protective covering over sheave, jaws and exposed gears (if applicable).
   b. Provide bi-directional and over-speed switches.
   c. A certificate must be obtained from Code Authorities that the new governor is acceptable for operation of the existing car safety gear.

I. Governor tail weight:

1. Provide new.
   a. Frame shall be ratchet or tension type held under 200 pounds tension.

J. Car frame and platform:

1. Retain existing car frame and platform.

a. Replace rubber supports and load weighing switches.

b. Provide new sills of extruded aluminum bronze nickel silver mounted with concealed fasteners.

c. Static balance weight to be added as required.

d. Clean down and tighten frame bolts.

K. Sheaves:

1. Retain existing secondary overhead deflecting 2:1 car 2:1 counterweight sheaves. Clean thoroughly, provide new bearings, seals and lubricants. Provide seismic rope retainers as required.

L. Compensation:

1. Retain existing sheaves, provide new ropes if required. Existing sheave assembly shall be cleaned, pivot points, guiding surfaces and bearings checked for proper movement and new lubricant provided. Provide new switch arranged to prevent elevator operation when sheave approaches upper or lower limit of travel.

## 2.13 MACHINE ROOM EQUIPMENT:

A. General:

1. Provide equipment to fit existing space and structural limitations. Coordinate related electrical, structural and mechanical.

B. Traction machines:

1. Retain existing gearless machine Nos. 1-19 and rehabilitate as follows:

a. Field Coils: Dismantle machine, remove and re-insulate field coils. Provide new field coils or rewind to the machine manufacturer's requirements. Spray the field coils with high quality insulating varnish. Provide a megger insulation test report of all field coils and armature windings; the megger reading to be a minimum of 500,000 ohms.

b. Commutator: Turn and undercut, clean and resurface the commutator. This work can be done on site but must be performed by an approved machine repair workshop contractor. Provide all new brush holders, insulation and brushes to the original manufacturer's standard.

c. Brake: Dismantle the brake; replace the linings, pivot pins and bushings. Clean and re-insulate the operating coil. Remove and clean the operating core. Realign the brake and set to withhold 125% load. Drill and pin brake spring nut.

d. Bearings: Replace the hoist machine main bearings and oil lubrication carriers with the exact bearings as recommended by the machine manufacturer. Provide recommended lubricants.

e. Drive Sheave: Provide new.

f. Reassembly: Check, realign the machine drive sheave to the car pickup following the realignment of the car guide rails. Provide data of the alignment checking and adjustment to Owner's Representative. Clean machine and repaint.

2. Retain existing geared machine No. 21 and rehabilitate as follows:

a. Brake: Dismantle; replace lining, pins and bushings. Clean, lubricate, reassemble, adjust and repaint.

b. Motor: Provide new AC motor matched to new Flux Vector AC motor drive.

c. Bearings: Flush, repack worm shafts, replace thrust bearing and provide new lubricants. Replace oil chain carrier.

d. Gears: Set backlash for smooth gear operation. Replace worm and ring gear if required for smooth operation.

e. Gear Case: Drain, flush, replace seals and provide new lubricants.

f. Drive Sheave: Retain existing and re-groove. Provide seismic rope retainers.

C. Ascending car protection:

1. Provide new ascending car protection that detect an ascending car over-speed condition at a speed not greater than 10% higher than the speed at which the car governor is set to trip.

a. If the over-speed detection means requires electrical power for its functioning:

1) A loss of electrical power to the ascending car over-speed detection and control means shall cause the immediate activation of the emergency brake.

2) The occurrence of a single ground or the failure of any mechanically operated switch shall not render the detection means inoperative.

3) Provide means to stop car if unintended motion occurs.

4) Provide any structural modifications to accommodate ascending car motion device. Provide structural engineers stamped installation drawings.

D. Controller:

1. Provide MCE or approved equal non-proprietary diagnostic control system from approved manufacturer; overload relays in three legs of power circuit and in loop circuit; cabinets with NEMA-1 enclosures and doors arranged with locks or mechanical latches. Provide permanently marked symbols or letters identical to those on wiring diagrams adjacent to each component.

a. The controller wiring shall be carried out in a neat and workmanlike manner in accordance with relevant requirements of National Electric Code and ASME A17.5.

b. All external connections to the equipment on each controller shall be made by means of approved cable thimbles and/or solderless cable lugs, depending on the current to be carried.

c. Condenser activated or dashpot timers, motors or incandescent globes for dampening acceleration and deceleration steps are unacceptable.

d. Main contactors or starter switches shall be horsepower rated and are not to be mounted directly to the steel cabinets, to ensure quiet operation of controllers.

e. The controllers must be properly shielded from line feeder pollution.

E. Power Conversion and Regulation Unit:

1. General:

a. All circuitry shall be as approved by the enforcing code. Operation shall be quiet and the performance standards herein specified shall be provided.

b. Design system to control starting and stopping and to prevent damage to motor from overload or excess current and to automatically disconnects power supply. Apply brake and bring car to rest in event of power failure or safety device operation.

c. Controllers shall not have failure modes which results in full power being applied to drive machine operation in event of phase reversal, phase failure or low voltage which might result in elevator malfunction.

d. Controllers shall provide adequate EMC to reject a 500 kHz to 1500 MHz rf signal at a power level 100 watts and a distance of 1 meter.

2. Solid State Control (PWM):

a. Provide smooth acceleration and deceleration by variable voltage applied to hoisting motor and by dynamic braking before brake application.

b. Provide system to convert 3 phase, 60 Hz, A.C. building power supply to a fixed D.C. voltage and then invert from D.C. voltage to a variable voltage, variable frequency. The carrier frequency shall be above 15,000 Hz.

c. Failure of any static control device, speed measuring circuit or speed pattern generating circuit to operate as intended or occurrence of single accidental ground or short circuit shall not permit car to start or run if any hoistway door or gate is open or unlocked.

d. Provide coordinated fault protection which protects entire power circuit and power semi-conductors against short circuit conditions; protects against limited faults arising from partial grounds, partial shorts in motor armature, or in power unit itself; protects drive motor against sustained overloads; and provides semi-conductor transient and incoming line phase sequence protection.

e. Protects building system power line against line voltage transients by providing each elevator drive with isolation transformer and devices to limit distortion to not more than 4% RMS of base 60 Hz line voltage, with frequencies above 600 Hz attenuated at minimum of 12 db per octave. Measure voltage distortion requirements at secondary of building system transformer used to provide power to elevator system.

f. System shall be provided with necessary devices to insure quiet operation not exceeding noise level specified in "Design Criteria" and to protect building system power line against line voltage transients.

F. Machine beams:

1. Provide all structural steel machine and sheave beams with dead end hitch plates, bearing plates, anchors and blocking as required to support equipment.

## 2.14 HYDRAULIC ELEVATOR EQUIPMENT:

A. Design Criteria:

1. Performance:

a. Contract Speed: Maximum twenty percent (20%) speed variation under any loading condition in the up direction.

b. Leveling: Within 3/8 inch under any loading condition. Level into floor at all times, do not overrun floor and level back.

c. Hydraulic pressure: Hydraulic components shall be factory tested for 600 PSI. Maximum operating pressure shall be 425 PSI.

2. Operating qualities:

a. Owner's Representative will judge riding qualities of cars and enforce the following requirements. Make all necessary adjustments.

1) Starting and stopping shall be smooth and comfortable. Slowdown, stopping and leveling shall be without jars or bumps.

3. Sound control:

a. Vibration: Sound isolate power units from building structure to prevent objectionable noise and vibration transmission to occupied building spaces.

b. Airborne noise: Maximum acoustical output level of:

1) 85 dBA measured in machine room.

2) 60 dBA measured in elevator cars during all sequences of operation.

3) 50 dBA measured in elevator lobbies.

## 2.15 HYDRAULIC HOISTWAY EQUIPMENT:

A. Guide rails and brackets:

1. Realign, clean, check, tighten, existing rails and replace Code non-complying brackets, fishplates and bolts. Provide log of the alignment corrections to the Owner's Representative.

B. Guide shoes:

1. Provide new guide shoes of the roller type with neoprene tires, minimum 3/4 inch wide and fully adjustable spring loaded to provide continuous contact with rail surfaces. Balance car to insure equal guide shoe pressure on all wheels and not exceed manufacturer's recommendations. Nominal roller diameter shall be 4 inches.

C. Buffers:

1. Retain existing.

D. Car frame and platform:

1. Retain existing car frame. Clean down and tighten frame bolts. Static balance weight to be added as required.

E. Platen isolation:

1. Provide minimum 3/4 inch thick steel plates between top of plunger and car frame with 1 inch rubber or neoprene isolation material between.

F. Cylinder: Provide new.

1. Cylinder Well and Casing: Remove existing cylinder plunger unit and provide new as follows:
   a. Well: The Elevator Installer shall familiarize himself with existing conditions and be responsible for drilling cylinder wells.
   b. Casing: Provide steel casing, 12 inches greater in diameter than wrapped cylinder and proper depth to retain hole and provide structural integrity of PVC casing. Provide minimum 10 gauge corrosion resistant well casing; water tight joints and closed bottom. Weld seams solid at multiple casing joints. Provide a steel ring at top of casing to be keyed into pit floor. Provide watertight seal at bottom using 2'-0" thick non-shrink concrete plug of type for installation under water where drive casing is required and closed bottom casing can not be installed.
   c. Provide minimum 3/8 inch thick PVC casing with watertight sealed couplings and bottom end caps. Inside diameter shall be 6 inches greater than outside diameter of cylinder. Extend PVC above pit floor to fit snug against cylinder head.
   d. Installation: Set cylinder and PVC casing within steel casing and backfill between all voids with clean dry neutral silica sand, well tamped. After cylinder is set, provide a watertight laminating or epoxy resin seal between PVC and top of cylinder. Plunger and cylinder shall be plumb within 1/16 inch.
2. Cylinder: Steel pipe, factory tested for 400 pounds/square inch working pressure. Sandblast or wire brush outside of cylinder to remove rust and scale. Paint with heavy coat of epoxy or mastic. Work shall be done in shop and repaired in field if coating is damaged.

G. Packing:

1. Provide new packing which inhibits leaking of oil with drip ring.

H. Scavenger pump:

1. Provide electrically operated scavenger pump with storage reservoir and float activated or other automatic means to return oil to system. Provide 1/4 inch copper tubing for oil return line.

I. Oil:

1. Provide Chevron OC turbine oil or approved equal, 150 SSU at 100 degrees F. temperature.

J. Piping: Provide new. Minimum Schedule 80 steel pipe suitable for 400 pounds pressure. No hoses shall be used in any part of piping. Provide sound isolating couplings in oil line between jack and pumping plant. Support piping using vibratim isolating mounts or hangers with integral felt or neoprene at least 1/4 inch thick.

1. Overhead and Exposed Piping: Use victaulic method of piping throughout system with victaulic type 77 fittings or equal. Provide drip deflectors at pipe joints where pipes run above inaccessible ceiling areas to prevent damage to these areas in case of joint leakage.

2. Underground Piping: Use threaded or welded joints. Protect with extruded high density polyethylene coating having a thickness of 25 to 60 mills applied with a minimum 8 mill thickness of modified rubber band adhesive material all as manufactured by Plexco or equal. Install piping on 3 inch bed of clean, dry sand and backfill with additional 3 inches of sand.

3. Testing: Before enclosing pipe system, close ends, fill with fluid, establish 400 PSI pressure and allow to stand for 24 hours. Make corrective repairs to leaks or pressure drop.

K. Pit Valves: Provide in each elevator pit a gate valve to shut off oil between cylinder and pumping plant, and a pressure type line rupture safety valve to shut off oil between cylinder head and pit valve. Activation of safety valve shall not void operation of lowering valve.

L. Ruptured pipe valve:

1. Provided new a pressure type line rupture safety valve to shut off oil between cylinder head and pit valve. Activation of safety valve shall not void operation of lowering valve.

## 2.16 MACHINE ROOM EQUIPMENT:

A. General:

1. Provide equipment to fit existing space and structural limitations. Coordinate related electrical, structural and mechanical work with other trades.

B. Pumping Plant: Provide new.

1. General: Self contained unit with sound reducing cabinet and sound isolated base.

2. Pump: IMO, Roper or accepted equal for 150 SSU oil, belt driven or submersible. Maximum speed 3600 RPM. Maximum pressure 425 pounds per square inch..

3. Tank: Capacity equal to plunger displacement plus 25%. Provide strainers, oil level gauge and device to maintain uniform oil temperature.

4. Valves: Integral type by Elevator Equipment Company, Maxton Company or by elevator manufacturer. Provide conveniently located manual lowering valve accessible without removing pumping plant enclosure panels.

5. Motor: General Electric, Imperial, Westinghouse or accepted equal; maximum speed 1800 RPM for belt driven and 3600 RPM for submersible. Provide minimum 120 start heavy-duty motor, continuous rated, 50 degrees C. temperature rise, Class A insulation or 70 degrees C. rise for Class B insulation.

6. Muffler: Blow-out proof type between pumping plant and cylinder.

C. Controller:

1. Integral, floor or wall mounted as applicable to space conditions. Include door operating relays combined with controller. Provide solid state soft starting with starting switches rated at minimum 57% of horsepower rating. IEC method of line starter application is unacceptable. Provide three (3) manual reset overload relays, one in each line and reverse phase relay. Provide externally mounted permanently identified junction boxes on controller cabinets for termination of communication circuits. Pre-approved controllers:

a. Motion Control Engineering HMC-2000

b. Smart Rise

D. Hydraulic elevator protective circuit:

1. In the event the car should stall due to low oil in the system or, if for other cause the car fails to reach the top landing within a predetermined time while traveling "up", a special circuit shall be provided which shall automatically return the car to the bottom landing and open the doors for 10 seconds after which the elevator will close doors and completely shut down. Recycling the mainline switch shall restore Service.

E. Hydraulic elevator battery emergency lowering operation:

1. Provide a battery driven unit which will initiate operation of the Protective Circuit and lower elevator to bottom landing in the event of a power failure.

2. Service shall be restored automatically upon restoration of normal power supply.

3. Arrange with an exposed method of testing.

4. Arrange circuitry so that, if the mainline switch is open when the power transfer takes place, the elevator will not respond to the operation of the protective circuit.

5. Provide a double pole-isolating switch on the battery unit to disconnect the battery output.

## PART 3 - EXECUTION:

### 3.01 GENERAL:

A. Bidding documents:

1. Bidders shall examine existing conditions. Any discrepancies which affect the elevator work or conditions adverse to the bidder's equipment shall be brought to Owner's Representative's attention at least seven (7) days prior to the bid date. If no discrepancies are presented, changes required to accommodate bidder’s equipment become the responsibility and cost to Contractor.

### 3.02 PREPARATION:

A. Field measurements:

1. Field verify dimensions before proceeding with the work.

2. Coordinate related work by other trades.

### 3.03 INSTALLATION:

A. General:

1. Install per manufacturer's requirements, those of regulatory agencies and as specified.

B. Welded Construction:

1. Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustments, inspection, maintenance and replacement of worn parts.

2. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Sound Isolation:

1. Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, designed to effectively prevent transmission of vibrations to structure and thereby, eliminate sources of structure-borne noise from elevator system.

D. Lubrication:

1. Lubricate operating parts of systems as recommended by manufacturer.

E. Alignment:

1. Coordinate alignment of hoistway entrances with elevator guide rails, for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe workable dimensions at each landing.

2. Align guide rails plumb and parallel with maximum deviation of 1/16 inch. Anchorage of guide rails in pits shall not compromise waterproofing.

F. Graphics:

1. Provide graphics visible to public as selected by Owner's Representative.

G. Manufacturer's nameplates:

1. Manufacturer's nameplates, trademarks or logos not permitted on surfaces visible to public.

H. Cleaning of the installation:

1. After the installation of each elevator has been completed and immediately prior to the carrying out of the tests, the machine room and all equipment therein, the elevator hoistways including outside of car and all ledges and similar areas, the elevator pit and equipment therein, and all door hanger runners, guides, tracks and sills shall be thoroughly cleaned down, preferably with vacuum cleaning equipment, and all dust, fluff, dirt, grit, excessive oil and grease and rubbish shall be removed from site.

I. Finish painting after tests:

1. After satisfactory completion of the tests, any damage to the paint work shall be made good and the installation re-cleaned, if necessary, after which at least one final coat of gloss oil resistant or enamelized paint shall be applied by brushing or spraying in Contractor's customary colors to all the existing and new equipment in the machine room and also to such items in the hoistway or elsewhere which have received only a primer coat.

2. Painting shall be performed either during normal working hours or after hours at no additional cost to the Owner.

J. Painting of machine room, car tops and pit floors:

1. After the completion of the entire installation, the floor of each machine room and pit areas shall be thoroughly cleaned down and brush painted with one coat of traffic paint having oil resistant properties. Owner’s Representative will advise the color. Machine room painting shall be done during normal working hours.

2. Painting shall be performed after hours at no additional cost to the Owner for the pits and cartop equipment.

## 3.04 NOISE CONTROL:

A. General:

1. Contractor, in the preparation and the execution of the work, shall recognize the particular and mandatory requirements of the remodeling project due to the character of the work and the use occupancy of the building.

2. Contractor shall perform all noisy work as directed by Owner's Representative.

B. Building operations:

1. Noise and vibration generated by this construction for this work may, at times, create a problem for the operations of the building. In the event the noise produced by the construction

work conflicts with the building function, Contractor, at the request of the Owner's Representative, shall reduce or stop the noise.

2. It should be noted that this is a courthouse and if directed by the Courts work shall stop immediately.

C. Measurement:

1. The noise level shall be measured on the "A" Scale of a sound level meter as follows:
   a. With the meter located 3'-0" from the nearest staff work station to the elevator lobby, the sound level shall not exceed 75 dBA.
   b. With the meter located 3'-0" from each machine room door at floor level, the sound level shall not exceed 85 dBA.
   c. With the meter located 3'-0" from any hoistway door at any level, the sound level shall not exceed 90 dBA.

D. Types of noise generating work:

1. All heavy demolition (concrete walls and floors).
2. All grinding, chipping, pounding, sanding and cutting of holes and core drilling.

## 3.05 TEMPORARY ELEVATOR USE DURING CONSTRUCTION:

A. General:

1. Should the other contractors require the use of any elevator during construction, he shall make arrangements directly with Contractor, coordinate temporary facilities and pay all costs associated with the protection, operation and use of elevators.

B. Maintenance:

1. Elevators shall be maintained on a regular basis during the temporary construction use. A minimum of two hours per week per elevator shall be spent on examination, lubrication, adjusting and cleaning the elevator equipment.

C. Damage:

1. The Owner is entitled to receive newly modernized elevator equipment upon final acceptance of the entire project.
2. The Owner’s Representative will thoroughly examine all elevator equipment upon completion of temporary use and provide a punch-list outlining items that must be repaired or replaced to ensure the equipment is in satisfactory condition. Final acceptance and payment will not be made until all items have been satisfactorily completed.

D. Schedule:

1. Sufficient time must be allowed to prepare and adjust temporary elevators so that the entire elevator installation is ready for final acceptance.

## 3.06 FIELD QUALITY CONTROL:

A. Regulatory agencies inspection:

1. Upon completion of elevators, Contractor shall provide instruments, weights and personnel to conduct test required by regulatory agencies. Contractor shall submit a complete report describing the results of the tests.

B. Examination and testing:

1. When installation is ready for final acceptance, notify and assist Owner's Representative in making a walk-through inspection of entire installation to assure workmanship and equipment complies with contract documents. Provide equipment to perform the following tests:
    a. One-hour heat and run test with full load in car. Perform for one car of each duty.
        1) Stop car at each floor in each direction.
        2) Provide well-shielded thermometers for motor and generator and verify that temperatures do not exceed 50 degrees Centigrade above ambient.
        3) Performance and leveling tests shall be made before and after heat and run test.
    b. Check and verify operation of all safety features and special operations.
        1) Measure horizontal acceleration.
        2) Pull mainline switch and check dynamic braking of Motor Drive units; fuses shall not blow.
        3) Measure acoustical output levels in machine room, lobbies and cars.

C. Correction:

1. Make corrections to defects or discrepancies at no cost to Owner's Representative. Should discrepancies be such that re-examination and retesting is required, Contractor shall pay for all costs including those of Owner's representative fees.

D. Final acceptance:

1. Final acceptance of the installation will be made only after all corrections are complete, final submittals and certificates received and the Owner's Representative is satisfied and the installation is complete in all respects. Final payment will not be made until the above is completed.

## 3.07 INSTRUCTIONS:

A. Instruct Owner's personnel in proper use of each system.

## 3.08 PROJECT RECORD DOCUMENTS:

A. As-built drawings:

1. Contractor shall maintain at the job site a separate and complete set of contract drawings which will be used solely for the purpose of recording changes made in any portion of the work during the course of construction, regardless of the reason for such change.

2. Changes, as they occur, will be marked on the record set of drawings on a daily basis.

3. The monthly payment will be withheld until the Owner's Representative has verified that "as-built" corrections are current. Before final payment is authorized, Contractor shall certify that all changes in the work are included on the drawings and will deliver such to the Owner's Representative.

B. Record drawings:

1. Contractor shall prepare "as-built" drawings in duplicate of any changes to electrical work on prints supplied by the Owner's Representative. During the course of construction, actual locations to scale shall be shown for all runs of mechanical and electrical work, installed in walls and floors or otherwise concealed. This shall cover all piping, electrical wiring, whether in conduit or cable, duct work, etc. shall be located, in addition, by dimension. All services shall be identified in ink on the prints.

2. In addition, Contractor shall keep a complete record copy of the plans and specifications for the use in preparing "as-built" plans and specifications at the end of the job. Contractor shall sign and date the prints and deliver them to the Owner's Representative.

## 3.09 MAINTENANCE:

A. General:

1. Provide complete continuing maintenance on entire elevator equipment during regular working hours on regular working days for the duration of the Project plus an additional year of maintenance during the warranty period following completion of the Project.

B. Examination:

1. Include systematic examination, adjustment, and lubrication of elevator equipment whenever required and replacement of defective parts with parts of same manufacture as required for proper operation. Contractor not responsible for repairs to car enclosures, door panels, frames, sills or platform flooring resulting from normal usage or misuse, accidents and negligence for which Contractor is not responsible. Examinations shall be performed weekly expending a minimum of one and one-half hour per unit per visit performing preventative maintenance service for traction elevators and monthly expending a minimum of one hour per unit per visit performing preventative maintenance service for hydraulic elevators .

C. Performance standards:

1. Maintain the performance standard set forth in this Specification and maintain correct operation of the dispatching system.

2. Maintain smooth starting and stopping, smooth riding qualities and accurate leveling at all times.

D. Call-backs:

1. In event of failures, provide 24 hour call-back service at no additional cost to Owner.

E. Elevator shutdowns:

1. Should any elevator become inoperative, repair within 24 hours of notification of such failure. Breakdown of major components shall be completed and service restored within 72 hours.

2. Failure to comply with above, Owner's Representative may order the work done by other contractors at Contractor's expense.

3. Devices repaired or replaced by others shall, nevertheless, become provided with maintenance by Contractor who shall become completely responsible for correct operation of such devices for lifetime of this contract.

F. Follow-up tests:

1. Test all safety devices and emergency operations at 6 month intervals or more often and submit written report on each test. Make tests at times which do not interfere with building operation.

G. Maintenance materials:

1. Expendable parts: Contractor shall provide a metal cabinet in at least one machine room on project premises containing expendable parts required for prompt replacement. Parts used for routine maintenance shall be replenished and stored in machine room to ensure an adequate supply is available.

2. Replacement parts: Keep the following parts in a warehouse within 50 miles of the project premises.

   a. One door operator motor of each type used.

   b. Transformers of each type installed.

   c. Two complete door interlocks.

   d. Complete SCR or Motor Drive Unit.

e. Parts for door protective devices.

f. Such other parts as are needed to insure prompt replacement in event of elevator shutdown such as spare control boards for computer-operated systems.

H. Maintenance data:

1. After completion, and prior to final acceptance, submit three sets of complete and accurate maintenance data specific for each elevator. Final payment will not be made until received.

a. Manuals: Describe proper use and maintenance of equipment, lubrication points, types of lubricants used and frequency of lubricant application.

b. Parts catalogs: Complete listing of all parts of equipment and components used in the installation.

c. Wiring diagrams: One laminated set mounted in machine room, one reproducible set delivered to Owner's Representative. Wiring diagrams shall be as built, specific for this installation, and reference identification on drawings shall match points identified on terminals of controllers.

d. Maintenance tool and software manuals: Provide maintenance tools and supporting software documentation required for the complete maintenance of the entire system including diagnostics and adjusting. Maintenance tool may be hand held or built into control system and shall be of the type not requiring recharging or reprogramming nor of the automatic destruct type. The tool and supporting software may be programmed to operate only with this project's identification serial numbering.

I. Final service and inspection:

1. Two weeks before expiration of the year's maintenance, the equipment shall be lubricated, fully serviced, adjusted to the standards designated and emergency service operation devices shall be checked. A complete inspection will be made by Owner's Representative.

J. Quotation:

1. The Firm Fixed Fee shall include the required maintenance of the elevators for the duration of the Project plus an additional year of maintenance and materials during the warranty period following completion of the Project.

**END OF ATTACHMENT 2**