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1.01 SCOPE

1
SECTION 01030
ALTERNATES

PART 1 GENERAL

1.01 SCOPE

A. Provide material and labor required for complete execution of accepted alternates. Comply with all provisions of the Contract Documents.

Alternates: Stearns Towers East & Darley Towers North

• None recommended at this time

END OF SECTION
SECTION 01040

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SECTION 01040
PROJECT PROCEDURES

PART 1 GENERAL

1.01 APPLICABLE CODES

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following Codes, laws, and/or Authorities, including revisions and changes in effect:
   1. Safety Code for Elevators and Escalators, ASME A17.1
   2. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2
   3. Elevator and Escalator Electrical Equipment, ASME A17.5
   4. National Electrical Code, NFPA 70
   5. Americans with Disabilities Act, ADA
   6. Local Fire Authority
   7. Requirements of most stringent provision of local applicable building code.
   9. Architectural Barriers Act Accessibility Standards ABAAS
   10. University of Colorado Standards and Regulations

1.02 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser/Property Management prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.03 OCCUPANCY AND WORK BY OTHERS

A. Contractor expressly affirms Purchaser's rights to let other contracts and employ other Contractors in connection with required work. Contractor will afford other Contractors and their workmen reasonable opportunity for introduction and storage of materials and equipment, for execution of their work, and will properly connect and coordinate its work with theirs. Contractor will also incorporate comparable provisions in all its subcontracts.

B. Contractor declares that other Contractors employed by Purchaser on basis of separate contracts may proceed at such times as necessary to install items of work required by Purchaser.

C. Contractor declares that it will cooperate with other Contractors employed by Purchaser and, in addition to other coordination and expediting efforts will coordinate their work by written notices regarding necessity of such work to be done on or before certain dates.

D. Contractor declares that it is responsible for review, stamped, and signed approval of all shop drawings for required work.

E. Contractor hereby declares that content of foregoing paragraphs and influence they may have on project:
   1. Shall not cause a change in stipulated Contract Sum
   2. Shall not cause a change in Construction Time Schedule

END OF SECTION
# SECTION 01300

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1.01 SUBMITTALS
1.02 FINAL CONTRACT DOCUMENTS
SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS

A. Within seven (7) calendar days after award of contract and before beginning equipment fabrication submit shop drawings, and required material samples for review. Allow three (3) days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of pit, hoistway, and machine room indicating equipment arrangement, elevation section of hoistway, details of car enclosures, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Cuts, samples, or shop drawings.
   5. Finish Material: Submit 3” x 12” samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
   6. Design Information: Provide calculations verifying the following:
      a. Adequacy of existing electrical provisions.
      b. Adequacy of retained equipment relative to code requirements if car weight increased by more than 5%.
      c. Machine room heat emissions in B.T.U.
      d. Adequacy of existing retained elevator machine beams.
      e. Adequacy of existing car platform structure for intended loading.
   7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, Code requirements, dimensions, fit, and interface with other work is Contractor’s responsibility.

C. Acknowledge and/or respond to review comments within fourteen 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions including Contractor elective revisions on each re-submittal. Contractor’s revision response time is not justification for equipment delivery or installation delay.

1.02 FINAL CONTRACT DOCUMENTS

A. See Section 01700, Project Closeout.

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PART 1 GENERAL

1.01 FINAL CLEANING

A. See Section 14210 for contractual requirements governing site cleaning. As a minimum:

1. Elevator hoistways and all equipment therein shall be cleaned and left free of rust, filings, welding slag, rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt, and dust. Include walls, building beams, sill ledges, and hoistway divider beams.

2. Care shall be taken by workpersons not to mark, soil, or otherwise deface existing or new surfaces. Clean and restore such surfaces to their original condition.

3. Clean down surfaces and areas which require final painting and finishing work. Cleaning includes removal of rubbish, broom cleaning of floors, removal of any loose plaster or mortar, dust and other extraneous materials from finish surfaces, and surfaces which will remain visible after the work is complete.

1.02 CONSULTANT’S FINAL OBSERVATION AND REVIEW REQUIREMENTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators and completed groups of elevators accepted on an interim basis, or elevators and groups of elevators completed, accepted, and placed in operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant’s final review. Work shall be considered ready for Consultant’s final contract compliance review when all Contractor’s tests are complete and all elements of work or a designated portion thereof are in place and elevator or group of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Consultant’s review. Notify Consultant five (5) working days in advance when ready for final review of elevator or group of elevators.

D. Consultant’s written list of observed deficiencies of materials, equipment and operating systems will be submitted to Contractor for corrective action. Consultant’s review shall include as a minimum:

1. Workmanship and equipment compliance with Contract Documents.


3. Performance of following is satisfactory:
   a. Starting, accelerating, running
   b. Decelerating, stopping accuracy
   c. Door operation and closing force
   d. Equipment noise levels
   e. Signal fixture utility
   f. Overall ride quality
   g. Performance of door control devices
   h. Operations of emergency two-way communication device
   i. Operations of emergency Intercom two-way communication system
   j. Operations of firefighters’ service
k. Operations of remote monitoring devices
l. Operations of emergency brake device

4. Test Results:
   a. In all test conditions, obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Purchaser and Consultant. Tests shall be conducted under both no load and full load condition.
   b. Temperature rise in motor windings limited to 50° Celsius above ambient. A full-capacity one (1) hour running test, stopping at each floor for ten (10) seconds in up and down directions, may be required.

E. Performance Guarantee: Should Consultant’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows:
   1. Replace equipment which does not meet code or Contract Document requirements.
   2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.
   3. Perform retesting required by governing code authority, Purchaser and Consultant.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

1.03 PURCHASER’S INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of “as-installed” elevator circuits with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser’s property.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required for inspecting or testing the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Provide any necessary interface cards required for equipment maintenance, code mandated testing, and troubleshooting.
   4. Lubrication instructions including recommended grade of lubricants.
   5. Parts catalogs for all replaceable parts including ordering forms and instructions.
   6. Four sets of keys for all switches and control features properly tagged and marked.
   7. Neatly bound instructions explaining all operating features including all apparatus in the car and lobby control panels.
   8. Neatly bound maintenance and adjustment instructions explaining areas to be addressed, methods and procedures to be used, and specified tolerances to be maintained for all equipment.
9. Diagnostic equipment complete with access codes, adjusters' manuals and set-up manuals for adjustment, diagnosis and troubleshooting of elevator system, and performance of routine safety tests.

B. Non-Proprietary Equipment Design: Provide three sets of neatly bound written information necessary for proper maintenance and adjustment for equipment of within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:

1. Straight-line wiring diagrams of "as-installed" elevator circuits, with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
   a. Name and symbol of each relay, switch, or other apparatus.
   b. Location on drawings, drawing sheet number and area, and location of all contacts.
   c. Location of apparatus, whether on controller or on car.

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

3. Printed instructions explaining all operating features.

4. Complete software documentation for all installed equipment.

5. Lubrication instructions, including recommended grade of lubricants.

6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.

7. Four sets of keys for all switches and control features properly tagged and marked.

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

9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Manufacturer.
   a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discreet components for the solid state elevator controller.
   b. Provide a separate, detachable device, as required to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
   c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

11. Parts catalog detailing part numbers and descriptions
C. Acceptance of such records by Purchaser/Consultant shall not be a waiver of any Contractor deviation from Contract Documents or shop drawings or in any way relieve Contractor from his responsibility to perform work in accordance with Contract Documents.

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SECTION 01900

RELATED WORK

PART 1 GENERAL

1.01 RELATED WORK BY CONTRACTOR PROVIDED BY OTHER TRADES

1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Pit access stationary ladder for each elevator.
4. Protect open hoistways and entrances during construction per OSHA Regulations.
5. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
6. Hoistway venting per Code.

B. Machine Room:

1. Self-closing and locking access door.
2. Ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
3. Class “ABC” fire extinguisher in each elevator machine room, BY OWNER

C. Electrical Service, Conductors, and Devices:

1. Lighting and GFCI convenience outlets in pit, machine room.
   a. 19 ft. candles in machine room
   b. 10 ft. candles in pit
2. Three-phase mainline copper power feeder to terminals of each elevator controller in the machine room with protected lockable "open" disconnecting means.
3. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable "open" disconnecting means located in machine room.
4. Emergency telephone shared line to each individual elevator control panel in elevator machine room.
5. Fire alarm initiating devices in each elevator lobby, for each group of elevators or single elevator and each machine room to initiate firefighters’ return feature. Device at top of hoistway if sprinklered. Provide alarm initiating signal wiring from hoistway or machine room connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters’ operation.
6. Firefighters’ telephone jack and announcement speaker in car with connection to individual elevator control panels in elevator machine room and elevator control panel in firefighters’ control room.
7. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters’ control room and/or control console. Coordinate size, number, and location of conduits with Elevator Contractor.
8. Means to automatically disconnect power to affected elevator drive unit and controller prior to activation of machine room fire sprinkler system and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room.
9. When sprinklers are provided in the hoistway all electrical equipment, located less than 4'-0" above the pit floor shall be identified for use in wet locations.

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SECTION 14220

ELECTRIC TRACTION ELEVATOR MODERNIZATION

University of Colorado at Boulder
Williams Village - PR006970 & HSG10638
Darley Towers North & Stearns Towers East

STEARNS TOWERS EAST

MODERNIZATION MUST BE SUBSTANTIALLY COMPLETED BETWEEN

May 13, 2013 – August 3, 2013

PART 1 GENERAL

1.01 WORK INCLUDED

A. Two traction elevators as follows:
   1. Geared Passenger Elevator Cars 1-2

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Applicable conditions of General, Special, and Supplemental Conditions, Division 1, and all sections listed in Contract Documents “Table of Contents.”

D. During the refurbishment of any equipment where fluids will be replaced, the University must document the quantities being replaced/removed.

E. Preventive maintenance per Section 14210.

F. Additional equipment or finishes furnished under this or other sections, installed under this section:
   1. In car Firefighters’ telephone jacks
   2. Power and wiring interface provisions for future card reader security system, hardware by OWNER
   3. Power and wiring interface provisions for CCTV – Hardware by OWNER

G. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, reused equipment, or dismantling and removal of existing equipment.

H. Unless specifically identified as “Reuse,” “Retain,” or “Refurbish,” provide new equipment.

I. Protective barriers between cars in normal operation and adjacent cars in the modernization process. Full depth and height of hoistway.

J. Hoistway, pit, and machine room barricades as required.

1.02 RELATED WORK PROVIDED UNDER OTHER SECTIONS

A. See Section 01900, Related Work Provided Under Other Sections.
1.03 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

C. Provisions of this specification are applicable to all elevators unless identified otherwise.

1.04 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: See Section 01040, Project Procedures.

B. Warranty:

1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Architect, Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

2. Defective is defined to include, but not be limited to: Operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

3. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.04, D, 1 & 2 above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

4. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Sections 01700 and 14220.

1.05 DOCUMENT AND SITE VERIFICATION

A. In order to discover and resolve conflicts or lack of definition which might create problems, Contractor must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structural, electrical, and mechanical provisions for compatibility with Contractor’s products. Purchaser will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Contractor’s equipment.

1.06 SUBMITTALS

A. See Section 01300, Submittals, and Section 01700, Final Contract Compliance Review, Article 1.03.

1.07 PERMIT, TEST AND INSPECTION

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.
B. Perform test required by Governing Authority in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative.

C. Supply personnel and equipment for test and final review by Consultant as required in Section 01700.

1.08 MAINTENANCE

A. Interim:
1. When one or more elevators are near completion and ready for service, the General Contractor may accept elevators for interim use and place in service prior to substantial completion of project, entirely at their own risk.
2. During this period General Contractor may pay a mutually agreed upon monthly amount per elevator for preventive maintenance to the elevator contractor. Indicate amount per unit per month with quotation.
3. Temporary acceptance form must be acceptable to General Contractor and signed prior to use.
4. General Contractor must provide or pay for temporary hoistway and car enclosures; protect installed equipment and finishes; pay for and return elevators to elevator subcontractor for all cleaning, repairs, and replacement of materials necessary to restore elevator to “as-new” condition as determined solely by representatives of the University of Colorado prior to final acceptance.

B. Warranty Maintenance:
1. Provide preventive maintenance and 24-hour emergency callback service for one year commencing on date of final acceptance by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator control room, hoistway, and pit in clean condition.
2. Use competent personnel, acceptable to the Purchaser, supervised and employed by Contractor.
3. The warranty maintenance period specified in Item 1 above shall be extended one (1) month for each three (3) month period in which equipment related failures average more than .25 per unit per month.
4. Purchaser retains the option to delete cost of warranty maintenance from new equipment contract and remit twelve (12) equal installments directly to Contractor during period in which maintenance is being performed.
5. Use competent personnel, acceptable to the Purchaser, employed and supervised by Contractor.

C. Services, except as otherwise noted under this Agreement, including unlimited emergency callback service, shall be performed during regular hours of regular working days of the Elevator Trade between the hours of 7:30 a.m. and 5:00 p.m. Monday through Friday ........ Provide overtime callback service at no additional cost under the following conditions:
1. Passenger entrapments.
2. Two (2) or more elevators out of service in any elevator group.

D. Response time for callback service:
1. During the hours identified in 1.08.C., Contractor shall arrive at Property within sixty (60) minutes from time of notification of equipment problem or failure by Purchaser.
2. During the hours identified in Item 1.08, C., Contractor shall arrive at Property in response to passenger entrapment calls within thirty (30) minutes from time of notification by Purchaser.
3. After hours, Contractor shall respond to callback service within sixty (60) minutes from the time of notification by Purchaser.

4. Purchaser, at its sole discretion, may reduce monthly Agreement amount by $300/occurrence for Contractor's repeated failure to meet callback response time.

E. Callback is defined as any request for service or assistance by Purchaser or Purchaser's representative when any unit is not available for beneficial usage due to equipment shutdown or malfunction.

F. If a unit is shut down due to equipment failure for more than seventy-two (72) continuous hours, maintenance billing for that unit shall be suspended until unit is restored to beneficial usage, excluding scheduled equipment repairs.

G. Removal of units from beneficial usage to facilitate Services shall be coordinated with and approved by the Purchaser and identified in the MCP, unless removal is necessitated for emergency repair or adjustment. Purchaser agrees to permit Contractor to remove units from service for a reasonable time during hours identified in Item 1.05, A., to perform Services.

PART 2 PRODUCTS

2.01 SUMMARY

A. Two (2) Passenger Elevators

B. Unless specifically identified as “retain existing,” provide new equipment.

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<th>Existing Equipment</th>
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<tbody>
<tr>
<td>Number: Cars No. 1-2</td>
<td>Retain Existing</td>
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<tr>
<td>Capacity: 2500 #</td>
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<tr>
<td>Class Loading: Passenger Class A</td>
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<tr>
<td>Contract Speed: 200 F.P.M.</td>
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<td>Roping: 1:1 Configuration</td>
<td>Retain Existing</td>
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<tr>
<td>Machine Location: Overhead</td>
<td>Retain Existing</td>
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<tr>
<td>Hoistmachine: Car 1</td>
<td>New Hollister Whiney geared traction machine to match Car No. 2</td>
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<tr>
<td>Car 2</td>
<td>Retain existing</td>
</tr>
<tr>
<td>Operational Control: Duplex Selective Collective Microprocessor-Based System</td>
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### Existing Equipment vs. Disposition

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<td>42” Wide X 84” High</td>
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</tr>
<tr>
<td>Entrance Type:</td>
<td>Single Speed, Center Opening</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Door Operation:</td>
<td>Medium Speed, Heavy Duty Door Operator, Minimum Opening Speed 1-1/2 F.P.S.</td>
<td>High Speed, Heavy-Duty, Door Operator, Minimum Opening Speed 2-1/2 F.P.S.</td>
</tr>
<tr>
<td>Door Protection:</td>
<td>Infrared, Full Screen Device</td>
<td>3-Dimensional Infrared, Full Screen Device with Differential Timing, Nudging and Interrupted Beam Time</td>
</tr>
<tr>
<td>Safety:</td>
<td>Flexible Guide Clamp – Type B, Car</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Guide Rails:</td>
<td>Planed Steel Tees</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Buffers:</td>
<td>Oil</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Car Enclosure:</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Battery Powered Emergency Car Lighting. Provide Separate Constant Pressure Test Button In Car Service Compartment.</td>
<td></td>
</tr>
<tr>
<td>Signal Fixtures:</td>
<td>LED Illumination. Contractor’s Vandal Resistant – Car / Hall Pushbuttons and signal fixtures</td>
<td></td>
</tr>
<tr>
<td>Hall and Car Pushbutton Stations:</td>
<td>Single Hall Pushbutton Riser – Flush Mount.</td>
<td>Single Applied Car Operating Panel</td>
</tr>
<tr>
<td>Existing Equipment</td>
<td>Disposition</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Car Position Indicators:</td>
<td>Single Digital with Car Direction Arrows in Car Operating Panel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply cover over existing position Indicator – No 4 brushed stainless steel</td>
<td></td>
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<tr>
<td>In Car Lanterns</td>
<td>Firefighters’ Control Panel</td>
<td></td>
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<tr>
<td></td>
<td>Volume Adjustable Electronic Chime or Tone. Sound Twice for Down Direction Vandal Resistant Assembly. Single fixture</td>
<td></td>
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<tr>
<td>Hall Car Position Indicator:</td>
<td>Digital with Car Direction Arrows at Main Floor – Flush Mount with Oversized Stainless Steel Backing Plate</td>
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<tr>
<td>Communication System:</td>
<td>Emergency Intercom System (≥ 60'-0” rise) Location of Master Station – Adjacent Fire Command Panel</td>
<td></td>
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<tr>
<td></td>
<td>Self-Dialing, Vandal Resistant, Push to Call, Two-Way Communication System with Recall, Tracking and Voiceless Communication</td>
<td></td>
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<tr>
<td>Fixture Submittal:</td>
<td>Submit Brochure Depicting Contractor’s Proposed Designs with Bid</td>
<td></td>
</tr>
<tr>
<td>Additional Features, Cars 1 &amp; 2:</td>
<td>$ 25,000 per Cab, Interior Finish Allowance in Base Bid.</td>
<td></td>
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<tr>
<td></td>
<td>Car Top Inspection Station</td>
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<td>Firefighters’ Service, Phase I and II, including Alternate Floor Return</td>
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<td>Accessibility Signage where Missing</td>
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<td>Stationary Car Return Panel Arranged for Surface Applied Car Operating Panel</td>
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<tr>
<td>Existing Equipment</td>
<td>Disposition</td>
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<td>------------------------------------------------------------------------------</td>
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<tr>
<td>Hoistway Access Switches, Top and Bottom Floors- Wall mounted adjacent hoistway door frames</td>
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<td>Hoistway Door Unlocking Device, All Floors with Escutcheon Rings</td>
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<tr>
<td>Load-Weighing Device</td>
<td></td>
<td></td>
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<tr>
<td>Anti-Nuisance Feature</td>
<td></td>
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<tr>
<td>Independent Service Feature</td>
<td></td>
<td></td>
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<tr>
<td>Firefighters’ Control Panel and Remote Wiring</td>
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<tr>
<td>Machine, Power Conversion Unit, and Controller Sound Isolation</td>
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<tr>
<td>Tamper Resistant Fasteners for All Fastenings Exposed to the Public</td>
<td></td>
<td></td>
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<tr>
<td>One Year Warranty Maintenance</td>
<td></td>
<td></td>
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<tr>
<td>Firefighters’ Telephone Jack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Visible Company Name or Logo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiring Diagrams, Operating Instructions, and Parts Ordering Information</td>
<td></td>
<td></td>
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<tr>
<td>Monitoring System</td>
<td></td>
<td></td>
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<tr>
<td>System Diagnostic Means and Instructions</td>
<td></td>
<td></td>
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<tr>
<td>Non-Proprietary Control System and Diagnostics Provisions as defined in UCB Traction Elevator Standards See Section 3.08A, 1-8 of this specification</td>
<td></td>
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</tr>
</tbody>
</table>
2.02 MATERIALS

A. See Section 14210.

2.03 CAR AND GROUP PERFORMANCE

A. Car Speed: ± 3% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop and hold 125% of rated load.

C. Car Stopping Zone: ±1/4” under any loading condition.

D. Door Opening Time: Seconds from start of opening to fully open:
   1. Cars 1-2: 2.0 seconds.

E. Door Closing Time: Seconds from start of closing to fully closed:
   1. Cars 1-2: 3.0 seconds.

F. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car level and stopped at next successive floor under any loading condition or travel direction (10'-0" typical floor height):
   1. Cars 1-2: 10.0 seconds.

G. Noise and Vibration Control
   1. Airborne Noise: Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA. All dBA readings to be taken 3'-0” off the floor and 3'-0” from the equipment using the “A” weighted scale.

2.04 OPERATION

A. Duplex Selective Collective Microprocessor-Based, Cars 1-2:
   1. Operate cars without attendants from pushbuttons in cars and located at each floor. When cars are available, park one car at main floor (“home” car). Park other car where last used (“free” car).
   2. Respond to car calls and hall calls above main floor using the free car. Once a car has started, respond to registered calls in the direction of travel and in the order the floors are reached.
   3. Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of the car and corresponding to the direction of car travel have been answered.
   4. Slow cars and stop automatically at floors corresponding to registered calls in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.
   5. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is the highest (or lowest) call registered.
   6. When the free car is clearing calls, start home car to respond to:
      a. A call registered on home car pushbuttons.
      b. An up hall call registered below free car.
      c. An up or a down call registered above free car while free car is traveling down.
d. A hall call when free car is delayed in its normal operation for a predetermined period.

7. When both cars are clearing calls, stop only one car in response to any registered hall call. Return the first car to clear its calls to main floor. Should last service required bring both cars to main floor, the first arriving car becomes the free car.

8. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

B. Other Items:

1. Load Weighing: Provide means for weighing car passenger load. Control system to provide dispatching at main floor in advance of normal intervals when car fills to capacity. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. Field adjustment range: 10% to 100%.

2. Anti-Nuisance Feature: If car loading relative to weight in car is not commensurate with number of registered car calls, cancel car calls. Systems employing either load weighing or door protective device for activation of this feature are acceptable.

3. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at the selected floor.

C. Firefighters’ Service: Provide equipment and operation in accordance with Code requirements including all necessary wiring and conduit runs to Fire Command Center.

D. Automatic Car Stopping Zone: Stop car within 1/4" above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, distance between landings, hoist rope slippage, or stretch.

E. Remote Monitoring and Diagnostics: Equip each controller and/or the group dispatch logic controller with standard ports, interface boards, and drivers to accept maintenance, data logging, fault finding diagnostic and monitoring computers, keyboards, modems, and programming tools. The system shall be capable of driving remote color LCD monitors that continually scan and display the status of each car and call.

F. Motion Control: Microprocessor based AC, variable-voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation, and dynamic braking. Limit the difference in car speed between full load and no load to not more than ±3% of the contract speed.

G. Door Operation: Automatically open doors when car arrives at main floor. At expiration of normal dwell time, close doors. Provide “heavy door-variable air pressure” feature for consistent specified door operation within appropriate speed and inertia limits.

H. Card/Proximity Reader Security System: Provide provisions within controls and traveling cable for Cars 1-2. Four (4) twisted pair

I. CCTV: Provide provisions within the traveling cable for Cars 1-2, one (1) co-axial cable and four (4) twisted pair

2.05 MACHINE ROOM EQUIPMENT

A. Arrange equipment in existing machine room spaces.
B. Geared Traction Hoist Machine: Car No. 2 Retain existing.
   1. Drain, flush and provide new gear lubricant.
   2. Replace worn gears and bearings.
   3. Provide supplemental rope and sheave guards as required.
   4. Retrofit new direct drive, digital, closed-loop velocity encoder on hoist machine.
   5. Provide drip pans to collect lubricant seepage.
   7. Other work deemed required to provide specified “like new” operation.
   8. Retrofit new AC V3F induction drive motor to existing gear case.
   9. Completely disassemble, clean, and inspect all brake components. Replace all worn or damaged parts. Reassemble and test for proper operation.

C. Geared Traction Hoist Machine: Car No. 1 Provide new
   1. Single worm geared or helical geared traction type with AC induction or P.M.S.M. ACV3F motor, brake, gear, drive shaft, and gear case mounted in proper alignment on an isolated bedplate. Provide bedplate blocking to elevate deflector sheave above machine room floor.
   2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
   3. Provide hoist machine drip pans to collect lubricant seepage.
   4. Deflector sheave: check bearings replace if necessary, verify proper groove depth, re-groove if necessary.

D. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

E. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
   6. Monitoring System Interface: Provide controller with serial data link through RJ45 Ethernet connection and install all devices necessary to monitor items outlined in
Section 2.13. Provide monitoring node in each controller and wire terminals to all devices to be monitored.

7. Provide controller or machine mounted auxiliary, lockable “open,” disconnect if mainline disconnect is not in sight of controller and/or machine.

F. Sleeves and Guards: Provide 2” steel angle guards around cable or duct slots through floor slabs or grating. Provide rope and smoke guards for sheaves, cables, and cable slots in machine room.

G. Machine and Equipment Support Beams: Retain existing in place. Provide all required supplemental supports and attachments necessary for installation of new hoist machine and motor.
   1. If additional supports are required, provide engineering to assure proper load and reaction bearing.
      a. Provide structural steel beams required for direct support of and attachment to building structure of hoist machine, deflector sheaves, overhead sheaves, governor, and hoist rope dead-end hitch assemblies.
      b. Provide bearing plates, anchors, shelf angles, blocking, embedment, etc., for support and fastening of machine beams or equipment to the building structure.
      c. Isolate machine and overhead sheave beams to prevent noise and vibration transmission to building structure.

H. Governor: Retain existing.
   1. Clean.
   2. Check bearings and replace if required.
   3. Recalibrate and seal.
   4. Retrofit bi-directional electrical shutdown switch.

I. Emergency Brake:
   1. Provide means to prevent ascending car over-speed and unintended car movement per Code.
   2. Acceptable emergency brake devices:
      a. BODE Rope Brake
      b. Hollister-Whitney Rope Gripper
   3. Mount the auxiliary brake on suitable structural steel supports. Provide a drawing showing the supports, stamped by Professional Engineer verifying the adequacy of the support provided.
   4. Provide control circuits to enable the device to function as required by Code.

2.06 HOISTWAY EQUIPMENT

A. Guide Rails: Retain main and counterweight guide rails in place.
   1. Clean rails and brackets. Remove rust if present.
   2. Check all rail and bracket fastenings and tighten.
   3. Realign rails as required to provide smooth car ride.

B. Buffers, Car: Retain existing.
   1. Wire Brush and Paint.
C. Sheaves: Retain existing.
   1. Re-groove or replace if required.
   2. Check all fastenings and tighten.
   3. Replace worn bearings.

D. Counterweight: Retain existing. Replace worn rollers.

E. Governor: Rebuild as required. As a minimum completely disassemble, clean, replace worn or faulty parts, and recalibrate governor.

F. Hoist Ropes:
   Car No. 1 – provide new
   1. 8 x 19 or 8 x 25 Seale construction, traction steel type. Fasten with staggered length, adjustable, spring isolated wedge type shackles

   Car No. 2
   2. Retain exiting, tension ropes to attain optimum traction.

G. Terminal Stopping: Provide normal and final devices.

H. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide four (4) pair of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.

   2. Conduit: Painted or galvanized steel conduit, EMT, or duct. Conduit size, 1/2". Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.

   3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway. Provide five (5) pair of shielded wires and one (1) RG-6/U type coaxial cables for card reader. Provide one (1) RG-6/U coaxial future CCTV cables within traveling cable from car controller to car top, plus 3'-0" excess loop at both ends. Provide two (2) pair 14 gauge wire for future CCTV power.

   4. Auxiliary Wiring: Connect fire alarm initiating devices, emergency two-way communication system, firefighters' phone jack, card reader and intercom, in each car controller in machine room.

   5. Wire & Cable Requirements for card readers and CCTV
      a. All card reader wiring must be “home run”. Daisy-chain wiring configuration of card readers & any RM bus devices is not allowed.

I. Entrance Equipment: Retain existing. Refurbish/replace and adjust assemblies to ensure smooth and quiet mechanical open and close of doors.

J. Entrance Equipment: Refurbish/replace and adjust assemblies to ensure smooth and quiet mechanical open and close of doors.
   1. Door Hangers: Replace as required.
   2. Door Rollers: New at all entrances.
   3. Door Track: Refurbish and/or replace as required.
   4. Door Interlocks: New contacts at all entrances.
K. Door Closers: New at all entrances  

L. Hoistway Door Unlocking Device: Provide unlocking device with escutcheon in door panel at all floors.  

M. Hoistway Access Switches: Mount in existing locations in wall at top and bottom floors. Provide switch with faceplate.  

N. Floor Numbers: Stencil paint 4” high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.  

2.07 HOISTWAY ENTRANCES  

A. Frames: Retain existing.  

B. Transom Panels: Retain existing  

C. Door Panels: Retain existing. Provide new door gibbs with fire tabs at all floors. Minimum two gibbs per panel, one at leading edge, and one at trailing edge of each panel  

D. Sight Guards: Retain existing. Replace damaged sight guards.  

E. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.  

F. Fascia, Toe Guards, and Hanger Covers: Retain existing. Provide as required where damaged or missing. Check and tighten all fastenings.  

G. Struts and Headers: Retain existing. Check and tighten all fastenings.  

H. Finish of Frames and Doors: Provide final painting requirements to General Contractor where factory prime finish is specified.  

<table>
<thead>
<tr>
<th>Cars</th>
<th>Floor</th>
<th>Frames</th>
<th>Door Panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Retain</td>
<td>Retain</td>
<td>Retain</td>
</tr>
</tbody>
</table>

2.08 CAR EQUIPMENT  

A. Frame: Retain Existing. Check and tighten all fastenings.  

B. Safety Device: Retain existing. Check and tighten all fastenings. Disassemble, clean, and inspect components. Replace all worn or damaged parts. Reassemble and test for proper operation.  

C. Platform: Retain existing. Reinforce if required. Check and tighten all fastenings.  

D. Platform Apron: Provide new extended platform apron to meet Code. Minimum 14 gauge steel, reinforced and braced to car platform front with black enamel  

E. Guide Shoes: Retain existing. Check and tighten all fastenings. Replace rollers.  

F. Finish Floor Covering:
1. Cars 1-2: By Owner

G. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

H. Doors: New – No. 4 Brushed Satin Stainless Steel.

I. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

J. Door Track: Bar or formed, cold-drawn removable steel track with smooth roller contact surface.

K. Door Header: Construct of minimum 12 gauge steel, shape to provide stiffening flanges.

L. Door Electrical Contact: Prohibit car operation unless car door is closed.

M. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutch so car doors can be closed, while hoistway doors remain open.

N. Restricted Opening Device: Restrict opening of car doors outside unlocking zone. Plunger type restrictors not acceptable.

O. Door Operator: High speed, linear drive, heavy-duty door operator capable of opening doors at no less than 2-1/2 f.p.s. Accomplish reversal in no more than 2-1/2" of door movement. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Maintain consistent, smooth, and quiet door operation at all floors, regardless of door weight or varying air pressure.

P. Door Control Device:
   1. Infrared Reopening Device: Black fully enclosed device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. Device shall prevent doors from closing and reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudging operation. In event of device failure, provide for automatic shutdown of car at floor level with doors open.
      a. Acceptable Infrared 3D Reopening Device:
         1) Cegard/MAX-154 by CEDES
         2) Gatekeeper by Adams
         3) Lambda 3D by Otis
         4) Microlite 3D by ThyssenKrupp
         5) Pana40 Plus 3D by Janus
   2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0 - 25.0 seconds), warning signal shall sound and doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override nudging operation and reopen doors.
   3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0 - 1.5 seconds after beams are reestablished.
   4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

Q. Car Operating Panel:
1. One car operating panel per car with faceplate, consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel. Faceplate shall be hinged and constructed of stainless steel, satin finish.
2. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with SCS, Visionmark, or Entrada cast tactile symbols rear mounted. Configure plates per local building code accessibility standards including Braille. Locate operating controls no higher than 48” above the car floor; no lower than 35” for emergency push-to-call button and alarm button.
3. Provide minimum 3/4” diameter raised floor pushbuttons which illuminate to indicate call registration.
4. Provide alarm button to ring bell located on car. Illuminate button when actuated.
5. Provide keyed stop switch at bottom of car operating panel in locked car service compartment. Mark device to indicate “run” and “stop” positions.
6. Provide “door open” button to stop and reopen doors or hold doors in open position.
7. Provide “door close” button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
8. Provide firefighters’ Phase II key switch with engraved instructions filled red. Include light jewel, buzzer, and call cancel button.
9. Install firefighters’ telephone jack with bezel matching adjacent controls.
10. Provide lockable service compartment with recessed flush door. Door material and finish shall match car return panel or car operating panel faceplate. Inside surface of door shall contain an integral flush window for displaying the elevator operating permit.
11. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   a. Inspection switch.
   b. Light switch.
   c. Three-position exhaust blower switch.
   d. Independent service switch.
   e. Constant pressure test button for battery pack emergency lighting.
   f. 120-volt, AC, GFCI protected electrical convenience outlet.
   g. Stop switch.
12. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters’ operating instructions on main operating panel above corresponding keyswitch filled red.
   b. Car number on main car operating panel.
   c. “Certificate of Inspection on File in Building Office” on main car operating panel.
   d. “No Smoking” on main car operating panel.
   e. Car capacity in pounds on service compartment door.

R. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

S. Communication System:
1. “Push to Call,” two-way communication instrument in car with automatic dialing, tracking, and recall features with shielded wiring to car controller in machine room.
Provide dialer with automatic rollover capability with minimum two numbers. Provide consolidator to allow multiple phones connected to one (1) line.

a. “Push to Call” button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL” “HELP ON THE WAY” engraved signage adjacent to button.

b. Provide “Push to Call” button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.

2. Firefighters' telephone jack in car and firefighters' panel, with four shielded wires to machine room junction box. Jack bezel shall match adjacent controls.

3. Provide two-way communication intercom between car and emergency personnel station.

2.09 CAR ENCLOSURE

A. Car Enclosure Passenger Elevator: Retain existing. Modify as required for application of new signal and pushbutton fixtures. Check and tighten all fasteners.

B. Provide Twenty Five thousand dollar ($25,000) cab interior allowance, per car in base bid

2.10 HALL CONTROL STATIONS

A. Pushbuttons: Provide one (1) riser with flush mounted fixtures. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation. Pushbutton design shall match car operating panel pushbuttons. Provide vandal resistant pushbutton and light assemblies. Provide faceplate sufficient to cover existing wall blockout and facilitate handicapped access requirements. Provide any cutting and patching required. LED lamps

2.11 SIGNALS

A. Car Direction Lantern, Cars 1-2: Provide flush-mounted car lantern in car entrance jamb. Illuminate up or down LED lights and sound electronic tone once for up and twice for down direction travel as doors open. Sound tone once for up direction and twice for down direction. Sound level shall be adjustable from 0 - 80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time. Car direction lenses shall be arrow shaped with faceplates. Lenses shall be minimum 2-1/2” in their smallest dimension. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2” high to indicate floor served and direction of car travel. Locate fixture in each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel.

C. Hall Position Indicator, Cars 1-2: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2” high to indicate floor served and direction of car travel. Provide vandal resistant indicator and light assemblies – flush mount at main floor in existing location with oversized stainless steel backing plate.

D. Faceplate Material and Finish: Stainless steel Satin finish all fixtures.
E. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

F. Voice Synthesizer: Provide electronic device with easily reprogrammable message and female voice to announce car direction, floor, emergency exiting instructions, etc.

G. Firefighters’ Control Panel: (Stearns - Locate in building fire control room) – (Darley – locate adjacent car # 2 at main landing) Fixture faceplate, stainless steel satin finish, including the following features:
   1. Car position and direction indicator (digital-readout). Identify each position indicator with car number
   2. Indicator showing operating status of car.
   3. Two-position firefighters’ emergency return switch and indicators with engraved instructions filled red.
   4. Firefighters’ telephone jack.
   5. Where applicable, identify all indicators and manual switches with appropriate engraving. Provide conduit and wiring to control panel.

H. Firefighters’ Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

I. Machine Room Monitoring System: Provide on-site monitoring capability for Cars 1-2
   1. Accumulate hall call registration information as part of monitoring capability. Provide memory capacity for at least the preceding five, 24-hour periods, in blocks of 5 or 15-minute segments, running hour to hour (i.e., 2:00 p.m. to 3:00 p.m.) Provide battery backup to prevent loss of accumulated data due to loss of normal power.
   2. Accumulate information for retrieval and use as follows:
      a. Visual and printed summary of hall call registration events by floor, direction, and duration, totaled in 5- or 15-minute segments during any 60-minute block using an internal clock.
      b. Visual and printed summary of hall call registration duration averaged for 5 or 15 minute and hourly periods.
      c. Visual and printed summary of percentage of hall calls answered within 30 and 60 seconds in each 5- or 15-minute period and hourly periods.
      d. Visual and printed summary of time periods during which individual cars are not in group operation (operating separately or out of service).
   3. Accumulate system fault data including nature of fault, time, and day. Store and retrieval capabilities for minimum 30-day period.
   4. Provide directions and software to accomplish information retrieval.
2.12 INTERCOM AND DISTRESS SIGNAL SYSTEM

A. General: Provide intercommunication system for Cars 1-2. Include all wiring between elevator hoistways and control panels. Include the following stations:

<table>
<thead>
<tr>
<th>Station Location</th>
<th>Type Station</th>
<th>Selection Buttons to Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefighters’ Control Panel</td>
<td>Master</td>
<td>Machine Room, Cars 1-2</td>
</tr>
<tr>
<td>Cars 1 &amp; 2</td>
<td>Master</td>
<td>Lobby Control Panel Adjacent Firefighter’s Control Panel</td>
</tr>
<tr>
<td>Cars 1-2</td>
<td>Remote</td>
<td>24/7 Monitored Emergency Personnel</td>
</tr>
</tbody>
</table>

B. Basic Equipment:
1. Amplifier providing static-free voice transmission with adequate volume and minimum distortion at all stations, with pre-amplifier capable of receiving voice and music inputs from building and emergency building communication system.
2. Activation of emergency building communication system overrides all other conversations and permits one-way conversation to all master stations in system.
3. Master Stations:
   a. Speaker-microphone combination, and/or handset for two-way communication.
   b. Selection buttons to enable communication with all master stations. Maintain continual reception of hands-free reply from station when a selected button is depressed.
   c. Two-Position “Talk/Listen” Button: Press to talk; release to listen.
   d. Illuminate “in use” light when any master station is being used.
   e. Reset button to make system available for use by any master station.
   f. Volume control knob for adjustment of incoming volume.
   g. Button to establish communications with all stations.
   h. Distress light in lobby panel which illuminates when “push to call” button or alarm button in car is actuated. Energize distress light and buzzer or chime until intercom selection button for that car has been depressed. Sound buzzer or chime in lobby panel simultaneously with illumination of distress light.
4. Remote Stations:
   a. Station in car shall be activated by “push to call” two-way communication button. “Push to call” button shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL,” “HELP ON THE WAY” engraved signage adjacent to button. Provide “push to call” button tactile symbol, engraved signage, and Braille adjacent to button.
   b. Locate car microphone and speaker, or transceiver/speaker combination in car canopy behind front return panel with drilled speaker pattern, with shielded wiring to machine room junction box.

C. Station Housings:
1. House master station in machine room in a metal compartment with baked enamel finish. Attach to the group elevator supervisory control panel or wall mount. Provide communication handset with 25'-0” long cord.
2. Provide control center master intercoms with stainless steel satin finish faceplates and engraved operating instructions. Coordinate faceplate size and installation of units with building Console Supplier.
PART 3 EXECUTION

3.01 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.02 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Contractor’s original, unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

3.03 INSTALLATION

A. Install all equipment in accordance with Contractor’s instructions, referenced codes, specification, and approved submittals.

B. Install machine room equipment with clearances in accordance with referenced codes, and specification.

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

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   3. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

3.04 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.05 ADJUSTMENTS

A. Install rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure joints without gaps and file any irregularities to a smooth surface.
B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Contractor’s instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.06 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

3.07 ACCEPTANCE REVIEW AND TESTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators, and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, and placed into operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant’s final review. Work shall be considered ready for Consultant’s final contract compliance review when all Contractor’s tests are complete and all elements of work or a designated portion thereof are in place and elevator or groups of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Consultant’s review. Notify Consultant a minimum of five (5) working days in advance when ready for final review of elevator or group.

D. Consultants’ written list of observed deficiencies of materials, equipment, and operating systems will be submitted to Contractor for corrective action. Consultant’s review shall include as a minimum:

1. Workmanship and equipment compliance with Contract Documents.
3. Performance of following is satisfactory:
   a. Starting, accelerating, running
   b. Decelerating, stopping accuracy
   c. Door operation and closing force
   d. Equipment noise levels
   e. Signal fixture utility
   f. Overall ride quality
   g. Performance of door control devices
   h. Operations of emergency two-way communication device
   i. Operations of firefighters’ service
4. Test Results:
   a. In all test conditions obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of
Purchaser and Consultant. Tests shall be conducted under both no load and full load condition.

b. Temperature rise in motor windings limited to 50° Celsius above ambient. A full-capacity one (1) hour running test, stopping at each floor for ten (10) seconds in up and down directions, may be required.

E. Performance Guarantee: Should Consultant’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows:
1. Replace equipment that does not meet code or Contract Document requirements.
2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

3.08 PURCHASER’S INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
1. Straight-line wiring diagrams of “as-installed” elevator circuits with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator control room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser’s property.
   a. Provide one (1) electronic copy of all required documentation
2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
3. Lubrication instructions including recommended grade of lubricants.
4. Parts catalogs for all replaceable parts including ordering forms, price lists and ordering instructions.
5. Four sets of keys for all switches and control features properly tagged and marked.
6. Diagnostic test devices together with all supporting information / documentation necessary for interpretation of test data, fault code interpretation, manufacturers acronym definitions, adjustment parameters, troubleshooting of elevator system, and performance of routine safety tests.
7. The elevator installation shall be a design that can be maintained by any licensed elevator maintenance company employing journeymen mechanics, or University of Colorado qualified elevator maintenance personnel without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
a. At the request of the University of Colorado, Provide 8 hours of onsite controller diagnostic training to University of Colorado qualified elevator maintenance personnel

b. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid state elevator controller.

c. Provide a separate, detachable device, as required to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.

d. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

8. Provide software upgrades and/or revisions during progress of the work, warranty period and a term of 10 years from the date of substantial completion.

END OF SECTION
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SECTION 14230

ELECTRIC TRACTION ELEVATOR MODERNIZATION

University of Colorado at Boulder
Williams Village - PR006970 & HSG10638
Darley Towers North & Stearns Towers East

DARLEY TOWERS NORTH

MODERNIZATION MUST BE SUBSTANTIALLY COMPLETED BETWEEN


PART 1 GENERAL

1.01 WORK INCLUDED

A. Two traction elevators as follows:
   1. Geared Passenger Elevators Cars 1-2

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Applicable conditions of General, Special, and Supplemental Conditions, Division 1, and all sections listed in Contract Documents “Table of Contents.”

D. Preventive maintenance as described in Section 14210.

E. Additional equipment or finishes furnished under this or other sections, installed under this section:
   1. In car Firefighters’ telephone jacks
   2. Provisions for future card reader security system
   3. Provisions for future CCTV

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, reused equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as “Reuse,” “Retain,” or “Refurbish,” provide new equipment.

H. Protective barriers between cars in normal operation and adjacent cars in the modernization process. Full depth and height of hoistway.

I. Hoistway, pit, and machine room barricades as required.

1.02 RELATED WORK PROVIDED UNDER OTHER SECTIONS

A. See Section 01900, Related Work Provided Under Other Sections.
1.03 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

C. Provisions of this specification are applicable to all elevators unless identified otherwise.

1.04 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: See Section 01040, Project Procedures.

B. Warranty:
   1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Architect, Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.
   2. Defective is defined to include, but not be limited to: Operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.
   3. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.04, D, 1 & 2 above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.
   4. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Sections 01700 and 14230.

1.05 DOCUMENT AND SITE VERIFICATION

A. In order to discover and resolve conflicts or lack of definition which might create problems, Contractor must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structural, electrical, and mechanical provisions for compatibility with Contractor’s products. Purchaser will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Contractor’s equipment.

1.06 SUBMITTALS

A. See Section 01300, Submittals, and Section 01700, Final Contract Compliance Review, Article 1.03.

1.07 PERMIT, TEST AND INSPECTION

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.
B. Perform test required by Governing Authority in accordance with procedure described in
ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the
presence of Authorized Representative.

C. Supply personnel and equipment for test and final review by Consultant as required in
Section 01700.

1.08 MAINTENANCE

A. Interim:
1. When one or more elevators are near completion and ready for service, the General
Contractor may accept elevators for interim use and place in service prior to
substantial completion of project, entirely at their own risk.
2. During this period General Contractor may pay a mutually agreed upon monthly
amount per elevator for preventive maintenance to the elevator contractor. Indicate
amount per unit per month with quotation.
3. Temporary acceptance form must be acceptable to General Contractor and signed
prior to use.
4. General Contractor must provide or pay for temporary hoistway and car enclosures;
protect installed equipment and finishes; pay for and return elevators to elevator sub-
contractor for all cleaning, repairs, and replacement of materials necessary to restore
elevator to "as-new" condition as determined solely by representatives of the
University of Colorado prior to final acceptance.

B. Warranty Maintenance:
1. Provide preventive maintenance and 24-hour emergency callback service for one
year commencing on date of final acceptance by Purchaser. Systematically
examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts
using parts produced by the Contractor of installed equipment. Maintain elevator
control room, hoistway, and pit in clean condition.
2. Use competent personnel, acceptable to the Purchaser, supervised and employed by
Contractor.
3. The warranty maintenance period specified in Item 1 above shall be extended one
(1) month for each three (3) month period in which equipment related failures
average more than .25 per unit per month.
4. Purchaser retains the option to delete cost of warranty maintenance from new
equipment contract and remit twelve (12) equal installments directly to Contractor
during period in which maintenance is being performed.
5. Use competent personnel, acceptable to the Purchaser, employed and supervised by
Contractor.

C. Services, except as otherwise noted under this Agreement, including unlimited emergency
callback service, shall be performed during regular hours of regular working days of the
Elevator Trade between the hours of 7:30 a.m. and 5:00 p.m. Monday through Friday .......... Provide overtime callback service at no additional cost under the following conditions:
1. Passenger entrapments.
2. Two (2) or more elevators out of service in any elevator group.

D. Response time for callback service:
1. During the hours identified in 1.08.C., Contractor shall arrive at Property within sixty
(60) minutes from time of notification of equipment problem or failure by Purchaser.
2. During the hours identified in Item 1.08, C., Contractor shall arrive at Property in
response to passenger entrapment calls within thirty (30) minutes from time of
notification by Purchaser.
3. After hours, Contractor shall respond to callback service within sixty (60) minutes from the time of notification by Purchaser.

4. Purchaser, at its sole discretion, may reduce monthly Agreement amount by $300/occurrence for Contractor’s repeated failure to meet callback response time.

E. Callback is defined as any request for service or assistance by Purchaser or Purchaser’s representative when any unit is not available for beneficial usage due to equipment shutdown or malfunction.

F. If a unit is shut down due to equipment failure for more than seventy-two (72) continuous hours, maintenance billing for that unit shall be suspended until unit is restored to beneficial usage, excluding scheduled equipment repairs.

G. Removal of units from beneficial usage to facilitate Services shall be coordinated with and approved by the Purchaser and identified in the MCP, unless removal is necessitated for emergency repair or adjustment. Purchaser agrees to permit Contractor to remove units from service for a reasonable time during hours identified in Item 1.05, A., to perform Services.

PART 2 PRODUCTS

2.01 SUMMARY

A. Two (2) Passenger Elevators

B. Unless specifically identified as “retain existing,” provide new equipment.

<table>
<thead>
<tr>
<th>Existing Equipment</th>
<th>Disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number: Cars No. 1-2</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Capacity: 2500 #</td>
<td>2500 #</td>
</tr>
<tr>
<td>Class Loading: Passenger Class A</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Contract Speed: 200 F.P.M.</td>
<td>200 F.P.M.</td>
</tr>
<tr>
<td>Roping: 1:1 Configuration</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Machine: Geared</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Machine Location: Overhead</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Operational Control: Duplex Selective Collective Microprocessor-Based System</td>
<td>Duplex Selective Collective Microprocessor-Based System</td>
</tr>
<tr>
<td>Motor Control: SCR - DC Control</td>
<td>AC Variable Voltage</td>
</tr>
<tr>
<td>Power Characteristics: Field Verify</td>
<td>Variable Frequency</td>
</tr>
<tr>
<td></td>
<td>Microprocessor Based with Digital Closed-Loop Feedback</td>
</tr>
<tr>
<td>Existing Equipment</td>
<td>Disposition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Stops:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>13 Front;</td>
<td></td>
</tr>
<tr>
<td>Openings:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>13 Front;</td>
<td></td>
</tr>
<tr>
<td>Floors Served:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>1-13 Front;</td>
<td></td>
</tr>
<tr>
<td>Travel:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Field Verify</td>
<td></td>
</tr>
<tr>
<td>Entrance Size:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>42&quot; Wide X 84&quot; High</td>
<td></td>
</tr>
<tr>
<td>Entrance Type:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Single Speed, Center Opening</td>
<td></td>
</tr>
<tr>
<td>Door Operation:</td>
<td>High Speed, Heavy-Duty, Door Operator, Minimum Opening Speed 2-1/2 F.P.S.</td>
</tr>
<tr>
<td>Medium Speed, Heavy-Duty Door Operator, Minimum Opening Speed 1-1/2 F.P.S.</td>
<td></td>
</tr>
<tr>
<td>Door Protection:</td>
<td>3-Dimensional Infrared, Full Screen Device with Differential Timing, Nudging and Interrupted Beam Time</td>
</tr>
<tr>
<td>Infrared, Full Screen Device</td>
<td></td>
</tr>
<tr>
<td>Safety:</td>
<td>Retain Existing</td>
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<tr>
<td>Flexible Guide Clamp – Type B, Car</td>
<td></td>
</tr>
<tr>
<td>Guide Rails:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Planed Steel Tees</td>
<td></td>
</tr>
<tr>
<td>Buffers:</td>
<td>Retain Existing</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>Car Enclosure:</td>
<td>Battery Powered Emergency Car Lighting. Provide Separate Constant Pressure Test Button In Car Service Compartment.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal Fixtures:</td>
<td>LED Illumination. Contractor’s Vandal Resistant – Car / Hall Pushbuttons</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Hall and Car</td>
<td>Single Hall Pushbutton Riser – Flush Mount</td>
</tr>
<tr>
<td>Pushbutton Stations:</td>
<td>Single Applied Car Operating Panel</td>
</tr>
<tr>
<td>Car Position Indicators:</td>
<td>Single Digital with Car Direction Arrows in Car Operating Panel</td>
</tr>
<tr>
<td></td>
<td>Firefighters’ Control Panel</td>
</tr>
<tr>
<td>Existing Equipment</td>
<td>Disposition</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>In Car Lanterns</td>
<td>Volume Adjustable Electronic Chime or Tone. Sound Twice for Down Direction Vandal Resistant Assembly. Single fixture</td>
</tr>
<tr>
<td>Hall Car Position Indicator:</td>
<td>Digital with Car Direction Arrows at Main Floor – Flush Mount with oversized stainless steel backing plate at main landing</td>
</tr>
<tr>
<td>Communication System:</td>
<td>Emergency Intercom System (&gt; 60'-0&quot; rise) Location of Master Station – Adjacent Fire Command Panel</td>
</tr>
<tr>
<td></td>
<td>Self-Dialing, Vandal Resistant, Push to Call, Two-Way Communication System with Recall, Tracking and Voiceless Communication</td>
</tr>
<tr>
<td>Fixture Submittal:</td>
<td>Submit Brochure Depicting Contractor’s Proposed Designs with Bid</td>
</tr>
<tr>
<td>Additional Features, Cars 1 &amp; 2:</td>
<td>$25,000 per cab, Interior Finish Allowance in Base Bid</td>
</tr>
<tr>
<td></td>
<td>Car Top Inspection Station</td>
</tr>
<tr>
<td></td>
<td>Firefighters’ Service, Phase I and II, including Alternate Floor Return</td>
</tr>
<tr>
<td></td>
<td>Accessibility Signage where Missing</td>
</tr>
<tr>
<td></td>
<td>Stationary Car Return Panel Arranged for Surface Applied Car Operating Panel</td>
</tr>
<tr>
<td></td>
<td>Hoistway Access Switches, Top and Bottom Floors- Wall mounted adjacent hoistway door frames</td>
</tr>
<tr>
<td></td>
<td>Hoistway Door Unlocking Device, All Floors with Escutcheon Rings</td>
</tr>
<tr>
<td></td>
<td>Platform Isolation</td>
</tr>
</tbody>
</table>
Existing Equipment | Disposition
---|---
Load-Weighing Device
Anti-Nuisance Feature
Independent Service Feature
Firefighters’ Control Panel and Remote Wiring located at adjacent car No. 2 on front wall at main landing
Machine, Power Conversion Unit, and Controller Sound Isolation
Tamper Resistant Fasteners for All Fastenings Exposed to the Public
One Year Warranty Maintenance
Firefighters’ Telephone Jack
No Visible Company Name or Logo
Wiring Diagrams, Operating Instructions, and Parts Ordering Information
Monitoring System
System Diagnostic Means and Instructions
Non-Proprietary Control System and Diagnostics Provisions as defined in UCB Traction Elevator Standards See Section 3.08A 1-8 of this specification

2.02 MATERIALS

A. See Section 14210.

2.03 CAR AND GROUP PERFORMANCE

A. Car Speed: ± 3% of contract speed under any loading condition.
B. **Car Capacity:** Safely lower, stop and hold 125% of rated load.

C. **Car Stopping Zone:** ±1/4" under any loading condition.

D. **Door Opening Time:** Seconds from start of opening to fully open:
   1. Cars 1-2: 2.0 seconds.

E. **Door Closing Time:** Seconds from start of closing to fully closed:
   1. Cars 1-2: 3.0 seconds.

F. **Car Floor-to-Floor Performance Time:** Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car level and stopped at next successive floor under any loading condition or travel direction (10'-0" typical floor height):
   1. Cars 1-2: 10.0 seconds.

G. **Noise and Vibration Control**
   1. **Airborne Noise:** Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.

2.04 **OPERATION**

A. **Duplex Selective Collective Microprocessor-Based, Cars 1-2:**
   1. Operate cars without attendants from pushbuttons in cars and located at each floor. When cars are available, park one car at main floor (“home” car). Park other car where last used (“free” car).
   2. Respond to car calls and hall calls above main floor using the free car. Once a car has started, respond to registered calls in the direction of travel and in the order the floors are reached.
   3. Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of the car and corresponding to the direction of car travel have been answered.
   4. Slow cars and stop automatically at floors corresponding to registered calls in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.
   5. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is the highest (or lowest) call registered.
   6. When the free car is clearing calls, start home car to respond to:
      a. A call registered on home car pushbuttons.
      b. An up hall call registered below free car.
      c. An up or a down call registered above free car while free car is traveling down.
      d. A hall call when free car is delayed in its normal operation for a predetermined period.
   7. When both cars are clearing calls, stop only one car in response to any registered hall call. Return the first car to clear its calls to main floor. Should last service required bring both cars to main floor, the first arriving car becomes the free car.
   8. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.
B. Other Items:
   1. Load Weighing: Provide means for weighing car passenger load. Control system to provide dispatching at main floor in advance of normal intervals when car fills to capacity. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. Field adjustment range: 10% to 100%.
   2. Anti-Nuisance Feature: If car loading relative to weight in car is not commensurate with number of registered car calls, cancel car calls. Systems employing either load weighing or door protective device for activation of this feature are acceptable.
   3. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.

C. Firefighters’ Service: Provide equipment and operation in accordance with Code requirements including all necessary wiring and conduit runs to Fire Command Center.

D. Automatic Car Stopping Zone: Stop car within 1/4” above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, distance between landings, hoist rope slippage, or stretch.

E. Remote Monitoring and Diagnostics: Equip each controller and the group dispatch logic controller with standard ports, interface boards, and drivers to accept maintenance, data logging, fault finding diagnostic and monitoring computers, keyboards, modems, and programming tools. The system shall be capable of driving remote color LCD monitors that continually scan and display the status of each car and call.

F. Motion Control: Microprocessor based AC, variable-voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation, and dynamic braking. Limit the difference in car speed between full load and no load to not more than ±3% of the contract speed.

G. Door Operation: Automatically open doors when car arrives at main floor. At expiration of normal dwell time, close doors. Provide “heavy door/variable air pressure” feature for consistent specified door operation within appropriate speed and inertia limits.


2.05 MACHINE ROOM EQUIPMENT

A. Arrange equipment in existing machine room spaces.

B. Geared Traction Hoist Machine: Retain existing.
   1. Provide supplemental rope and sheave guards as required.
   2. Retrofit new direct drive, digital, closed-loop velocity encoder on hoist machine.
   3. Provide drip pans to collect lubricant seepage.
   5. Other work deemed required to provide specified “like new” operation.
   6. Retrofit new AC V3F induction drive motor to existing gear case.
   7. Completely disassemble, clean, and inspect all brake components. Replace all worn or damaged parts. Reassemble and test for proper operation.
   8. Deflector sheave: check bearings replace if necessary, verify proper groove depth, re-groove if necessary.
C. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

D. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
   6. Monitoring System Interface: Provide controller with serial data link through RJ45 Ethernet connection and install all devices necessary to monitor items outlined in Section 2.13. Provide monitoring node in each controller and wire terminals to all devices to be monitored. Elevator contractor responsible to connect monitoring system interface to machine room monitoring compartment and LAN. Wiring from the LAN to the machine room monitoring compartment by others.
   7. Provide controller or machine mounted auxiliary, lockable “open,” disconnect if mainline disconnect is not in sight of controller and/or machine.

E. Sleeves and Guards: Provide 2” steel angle guards around cable or duct slots through floor slabs or grating. Provide rope and smoke guards for sheaves, cables, and cable slots in machine room.

F. Machine and Equipment Support Beams: Retain existing in place. Provide all required supplemental supports and attachments necessary for installation of new hoist machine and motor.
   1. If additional supports are required, provide engineering to assure proper load and reaction bearing.
      a. Provide structural steel beams required for direct support of and attachment to building structure of hoist machine, deflector sheaves, overhead sheaves, governor, and hoist rope dead-end hitch assemblies.
      b. Provide bearing plates, anchors, shelf angles, blocking, embedment, etc., for support and fastening of machine beams or equipment to the building structure.
Isolate machine and overhead sheave beams to prevent noise and vibration transmission to building structure.

G. Governor: Retain existing.
   1. Clean.
   2. Check bearings and replace if required.
   3. Recalibrate and seal.
   4. Retrofit bi-directional electrical shutdown switch

H. Emergency Brake:
   1. Provide means to prevent ascending car over-speed and unintended car movement per Code.
   2. Acceptable emergency brake devices:
      a. BODE Rope Brake
      b. Hollister-Whitney Rope Gripper
   3. Mount the auxiliary brake on suitable structural steel supports. Provide a drawing showing the supports, stamped by Professional Engineer verifying the adequacy of the support provided.
   4. Provide control circuits to enable the device to function as required by Code.

2.06 HOISTWAY EQUIPMENT

A. Guide Rails: Retain main and counterweight guide rails in place.
   1. Clean rails and brackets. Remove rust.
   2. Check all rail and bracket fastenings and tighten.
   3. Realign rails as required to provide smooth car ride.
   4. Provide supplemental rail brackets and/or backing as required by Code or to enhance car ride quality.

B. Buffers, Car: Retain existing.
   1. Wire Brush and Paint.

C. Sheaves: Retain existing.
   1. Re-groove or replace if required.
   2. Check all fastenings and tighten.
   3. Replace worn bearings

D. Counterweight: Retain existing. Replace worn rollers.

E. Governor Sheaves: Retain existing. Rebuild as required. As a minimum completely disassemble, clean, replace worn or faulty parts, and recalibrate governor.

F. Governor Ropes: Retain existing or replace if estimated remaining life is less than five years. No proration is allowed under terms of Maintenance Agreement.

G. Hoist Ropes: retain existing


I. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction
boxes. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide four (4) pair of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.

2. Conduit: Painted or galvanized steel conduit, EMT, or duct. Conduit size, 1/2". Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.

3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway. Provide five (5) pair of shielded wires and one (1) RG-6/U type coaxial cables for card reader. Provide one (1) RG-6/U coaxial future CCTV cables within traveling cable from car controller to car top, plus 3'-0" excess loop at both ends. Provide two (2) pair 14 gauge wire for future CCTV power.

4. Auxiliary Wiring: Connect fire alarm initiating devices, emergency two-way communication system, firefighters’ phone jack, card reader and intercom, in each car controller in machine room.

5. Wire & Cable Requirements for card readers and CCTV
   a. All card reader wiring must be “home run”. Daisy-chain wiring configuration of card readers & any RM bus devices is not allowed.

J. Entrance Equipment: Retain existing. Refurbish/replace and adjust assemblies to ensure smooth and quiet mechanical open and close of doors.

K. Entrance Equipment: Refurbish/replace and adjust assemblies to ensure smooth and quiet mechanical open and close of doors.
   1. Door Hangers: Replace as required.
   2. Door Rollers: New at all entrances
   3. Door Track: Refurbish and/or replace as required.
   4. Door Interlocks: New contacts at all entrances
   5. Door Closers: New at all entrances

L. Hoistway Door Unlocking Device: Provide unlocking device with escutcheon in door panel at all floors.

M. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide switch with faceplate.

N. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.07 HOISTWAY ENTRANCES

A. Frames: Retain existing.

B. Transom Panels: Retain existing

C. Door Panels: Retain existing. Provide new door gib with fire tabs at all floors. Minimum two gibbs per panel, one at leading edge, and one at trailing edge of each panel

D. Sight Guards: Retain existing. Replace damaged sight guards.

E. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.
F. Fascia, Toe Guards, and Hanger Covers: Retain existing. Provide as required where damaged or missing. Check and tighten all fastenings.

G. Struts and Headers: Retain existing. Check and tighten all fastenings.

H. Finish of Frames and Doors: Provide final painting requirements to General Contractor where factory prime finish is specified.

<table>
<thead>
<tr>
<th>Cars</th>
<th>Floor</th>
<th>Frames</th>
<th>Door Panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Retain</td>
<td>Retain</td>
<td>Retain</td>
</tr>
</tbody>
</table>

2.08 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings.

B. Safety Device: Retain existing. Check and tighten all fastenings. Disassemble, clean, and inspect components. Replace all worn or damaged parts. Reassemble and test for proper operation.

C. Platform: Retain existing. Reinforce if required. Check and tighten all fastenings.

D. Platform Apron: Provide new extended platform apron to meet Code. Minimum 14 gauge steel, reinforced and braced to car platform front with black enamel

E. Guide Shoes: Retain existing. Check and tighten all fastenings. Replace rollers.

F. Finish Floor Covering:
   1. Cars 1-2: By Owner

G. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

H. Doors: New – No. 4 Brushed Satin Stainless Steel.

I. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

J. Door Track: Bar or formed, cold-drawn removable steel track with smooth roller contact surface.

K. Door Header: Construct of minimum 12 gauge steel, shape to provide stiffening flanges.

L. Door Electrical Contact: Prohibit car operation unless car door is closed.

M. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutch so car doors can be closed, while hoistway doors remain open.

N. Restricted Opening Device: Restrict opening of car doors outside unlocking zone. Plunger type restrictors not acceptable.
O. Door Operator: High speed, linear drive, heavy-duty door operator capable of opening doors at no less than 2-1/2 f.p.s. Accomplish reversal in no more than 2-1/2” of door movement. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Maintain consistent, smooth, and quiet door operation at all floors, regardless of door weight or varying air pressure.

P. Door Control Device:
1. Infrared Reopening Device: Black fully enclosed device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0” above finished floor. Device shall prevent doors from closing and reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudging operation. In event of device failure, provide for automatic shutdown of car at floor level with doors open.
   a. Acceptable Infrared 3D Reopening Device:
      1) Cegard/MAX-154 by CEDES
      2) Gatekeeper by Adams
      3) Lambda 3D by Otis
      4) Microlite 3D by ThyssenKrupp
      5) Pana40 Plus 3D by Janus
2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0 - 25.0 seconds), warning signal shall sound and doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override nudging operation and reopen doors.
3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0 - 1.5 seconds after beams are reestablished.
4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
   a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

Q. Car Operating Panel:
1. One car operating panel per car with faceplate, consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel. Faceplate shall be hinged and constructed of stainless steel, satin finish.
2. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with SCS, Visionmark, or Entrada cast tactile symbols rear mounted. Configure plates per local building code accessibility standards including Braille. Locate operating controls no higher than 48” above the car floor; no lower than 35” for emergency push-to-call button and alarm button.
3. Provide minimum 3/4” diameter raised floor pushbuttons which illuminate to indicate call registration.
4. Provide alarm button to ring bell located on car. Illuminate button when actuated.
5. Provide keyed stop switch at bottom of car operating panel in locked car service compartment. Mark device to indicate “run” and “stop” positions.
6. Provide “door open” button to stop and reopen doors or hold doors in open position.
7. Provide “door close” button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
8. Provide firefighters’ Phase II key switch with engraved instructions filled red. Include light jewel, buzzer, and call cancel button.
9. Install firefighters’ telephone jack with bezel matching adjacent controls.
10. Provide lockable service compartment with recessed flush door. Door material and finish shall match car return panel or car operating panel faceplate. Inside surface of door shall contain an integral flush window for displaying the elevator operating permit.
11. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   a. Inspection switch.
   b. Light switch.
   c. Three-position exhaust blower switch.
   d. Independent service switch.
   e. Constant pressure test button for battery pack emergency lighting.
   f. 120-volt, AC, GFCI protected electrical convenience outlet.
   g. Stop switch.
12. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters’ operating instructions on main operating panel above corresponding keyswitch filled red.
   b. Car number on main car operating panel.
   c. “Certificate of Inspection on File in Building Office” on main car operating panel.
   d. “No Smoking” on main car operating panel.
   e. Car capacity in pounds on service compartment door.

R. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

S. Work Light and Duplex Plug Receptacle: GFCI protected outlet at top and bottom of car. Include on/off switch and lamp guard.

T. Communication System:
   1. “Push to Call,” two-way communication instrument in car with automatic dialing, tracking, and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers. Provide consolidator to allow multiple phones connected to one (1) line.
      a. “Push to Call” button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL” “HELP ON THE WAY” engraved signage adjacent to button.
      b. Provide “Push to Call” button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.
   2. Firefighters’ telephone jack in car and firefighters’ panel, with four shielded wires to machine room junction box. Jack bezel shall match adjacent controls.
   3. Provide two-way communication intercom between car and emergency personnel station.

2.09 CAR ENCLOSURE

A. Car Enclosure Passenger Elevator: Retain existing. Modify as required for application of new signal and pushbutton fixtures. Check and tighten all fasteners.

B. Provide Twenty five thousand dollar ($25,000) cab interior allowance, per car, in base bid
2.10 HALL CONTROL STATIONS

A. Pushbuttons: Provide one (1) riser with flush mounted fixtures. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation. Pushbutton design shall match car operating panel pushbuttons. Provide vandal resistant pushbutton and light assemblies. Provide faceplate sufficient to cover existing wall blockout and facilitate handicapped access requirements. Provide any cutting and patching required. LED lamps

2.11 SIGNALS

A. Car Direction Lantern, Cars 1-2: Provide flush-mounted car lantern in car entrance jamb. Illuminate up or down LED lights and sound electronic tone once for up and twice for down direction travel as doors open. Sound tone once for up direction and twice for down direction. Sound level shall be adjustable from 0 - 80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time. Car direction lenses shall be arrow shaped with faceplates. Lenses shall be minimum 2-1/2" in their smallest dimension. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Locate fixture in each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel.

C. Hall Position Indicator, Cars 1-2: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Provide vandal resistant indicator and light assemblies – flush mount at main floor in existing location with oversized stainless steel backing plate.

D. Faceplate Material and Finish: Stainless steel Satin finish all fixtures.

E. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

F. Voice Synthesizer: Provide electronic device with easily reprogrammable message and female voice to announce car direction, floor, emergency exiting instructions, etc.

G. Firefighters’ Control Panel: Locate adjacent top Car No. 2 at main lobby. Fixture faceplate, stainless steel satin finish, including the following features:
   1. Car position and direction indicator (digital-readout). Identify each position indicator with car number
   2. Indicator showing operating status of car.
   3. Two-position firefighters’ emergency return switch and indicators with engraved instructions filled red.
   4. Firefighters’ telephone jack.
   5. Where applicable, identify all indicators and manual switches with appropriate engraving. Provide conduit and wiring to control panel.

H. Firefighters’ Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.
I. Machine Room Monitoring System: Provide on-site monitoring capability for Cars 1-2

1. Accumulate hall call registration information as part of monitoring capability. Provide memory capacity for at least the preceding five, 24-hour periods, in blocks of 5 or 15-minute segments, running hour to hour (i.e., 2:00 p.m. to 3:00 p.m.) Provide battery backup to prevent loss of accumulated data due to loss of normal power.

2. Accumulate information for retrieval and use as follows:
   a. Visual and printed summary of hall call registration events by floor, direction, and duration, totaled in 5- or 15-minute segments during any 60-minute block using an internal clock.
   b. Visual and printed summary of hall call registration duration averaged for 5 or 15 minute and hourly periods.
   c. Visual and printed summary of percentage of hall calls answered within 30 and 60 seconds in each 5- or 15-minute period and hourly periods.
   d. Visual and printed summary of time periods during which individual cars are not in group operation (operating separately or out of service).

3. Accumulate system fault data including nature of fault, time, and day. Store and retrieval capabilities for minimum 30-day period.

4. Provide directions and software to accomplish information retrieval.

2.12 INTERCOM AND DISTRESS SIGNAL SYSTEM

A. General: Provide intercommunication system for Cars 1-2. Include all wiring between elevator hoistways and control panels. Include the following stations:

<table>
<thead>
<tr>
<th>Station Location</th>
<th>Type Station</th>
<th>Selection Buttons to Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefighters’ Control Panel</td>
<td>Master</td>
<td>Machine Room, Cars 1-2</td>
</tr>
<tr>
<td>Cars 1 &amp; 2</td>
<td>Master</td>
<td>Lobby Control Panel Adjacent Firefighter’s Control Panel</td>
</tr>
<tr>
<td>Cars 1-2</td>
<td>Remote</td>
<td>24/7 Monitored Emergency Personnel</td>
</tr>
</tbody>
</table>

B. Basic Equipment:

1. Amplifier providing static-free voice transmission with adequate volume and minimum distortion at all stations, with pre-amplifier capable of receiving voice and music inputs from building and emergency building communication system.

2. Activation of emergency building communication system overrides all other conversations and permits one-way conversation to all master stations in system.

3. Master Stations:
   a. Speaker-microphone combination, and/or handset for two-way communication.
   b. Selection buttons to enable communication with all master stations. Maintain continual reception of hands-free reply from station when a selected button is depressed.
   c. Two-Position “Talk/Listen” Button: Press to talk; release to listen.
   d. Illuminate “in use” light when any master station is being used.
   e. Reset button to make system available for use by any master station.
   f. Volume control knob for adjustment of incoming volume.
   g. Button to establish communications with all stations.
   h. Distress light in lobby panel which illuminates when “push to call” button or alarm button in car is actuated. Energize distress light and buzzer or chime until intercom selection button for that car has been depressed. Sound buzzer or chime in lobby panel simultaneously with illumination of distress light.
4. Remote Stations:
   a. Station in car shall be activated by “push to call” two-way communication button. “Push to call” button shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL,” “HELP ON THE WAY” engraved signage adjacent to button. Provide “push to call” button tactile symbol, engraved signage, and Braille adjacent to button.
   b. Locate car microphone and speaker, or transceiver/speaker combination in car canopy behind front return panel with drilled speaker pattern, with shielded wiring to machine room junction box.

C. Station Housings:
   1. House master station in machine room in a metal compartment with baked enamel finish. Attach to the group elevator supervisory control panel or wall mount. Provide communication handset with 25'-0" long cord.
   2. Provide control center master intercoms with stainless steel satin finish faceplates and engraved operating instructions. Coordinate faceplate size and installation of units with building Console Supplier.

PART 3 EXECUTION

3.01 SITE CONDITION INSPECTION
   A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.
   B. Do not proceed with installation until work in place conforms to project requirements.

3.02 PRODUCT DELIVERY, STORAGE, AND HANDLING
   A. Deliver material in Contractor’s original, unopened protective packaging.
   B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.
   C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

3.03 INSTALLATION
   A. Install all equipment in accordance with Contractor’s instructions, referenced codes, specification, and approved submittals.
   B. Install machine room equipment with clearances in accordance with referenced codes, and specification.
   C. Install all equipment so it may be easily removed for maintenance and repair.
   D. Install all equipment for ease of maintenance.
   E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.
F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   3. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

3.04 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.05 ADJUSTMENTS

A. Install rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure joints without gaps and file any irregularities to a smooth surface.

B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Contractor’s instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.06 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

3.07 ACCEPTANCE REVIEW AND TESTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators, and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, and placed into operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant’s final review. Work shall be considered ready for Consultant’s final contract compliance review when all Contractor’s tests are complete and all elements of work or a designated portion thereof are in place and elevator or groups of elevators are deemed ready for service as intended.
C. Furnish labor, materials, and equipment necessary for Consultant’s review. Notify Consultant a minimum of five (5) working days in advance when ready for final review of elevator or group.

D. Consultants’ written list of observed deficiencies of materials, equipment, and operating systems will be submitted to Contractor for corrective action. Consultant’s review shall include as a minimum:
1. Workmanship and equipment compliance with Contract Documents.
3. Performance of following is satisfactory:
   a. Starting, accelerating, running
   b. Decelerating, stopping accuracy
   c. Door operation and closing force
   d. Equipment noise levels
   e. Signal fixture utility
   f. Overall ride quality
   g. Performance of door control devices
   h. Operations of emergency two-way communication device
   i. Operations of firefighters’ service
4. Test Results:
   a. In all test conditions obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Purchaser and Consultant. Tests shall be conducted under both no load and full load condition.
   b. Temperature rise in motor windings limited to 50°C Celsius above ambient. A full-capacity one (1) hour running test, stopping at each floor for ten (10) seconds in up and down directions, may be required.

E. Performance Guarantee: Should Consultant’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows:
1. Replace equipment that does not meet code or Contract Document requirements.
2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

3.08 PURCHASER’S INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
1. Straight-line wiring diagrams of “as-installed” elevator circuits with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator control room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing
sets with addition of all subsequent changes. These diagrams are Purchaser’s property.

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

3. Lubrication instructions including recommended grade of lubricants.

4. Parts catalogs for all replaceable parts including ordering forms, price lists and ordering instructions.

5. Four sets of keys for all switches and control features properly tagged and marked.

6. Diagnostic test devices together with all supporting information / documentation necessary for interpretation of test data, fault code interpretation, manufacturers acronym definitions, adjustment parameters, troubleshooting of elevator system, and performance of routine safety tests.

7. The elevator installation shall be a design that can be maintained by any licensed elevator maintenance company employing journeymen mechanics, or University of Colorado qualified elevator maintenance personnel without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
   a. At the request of the University of Colorado, Provide 8 hours of onsite controller diagnostic training to University of Colorado qualified elevator maintenance personnel
   b. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid state elevator controller.
   c. Provide a separate, detachable device, as required to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
   d. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

8. Provide software upgrades and/or revisions during progress of the work, warranty period and a term of 10 years from the date of substantial completion.

END OF SECTION
# ELECTRIC TRACTION ELEVATORS

## SECTION 14210

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SECTION 14210

ELECTRIC TRACTION ELEVATORS

FOR REFERENCE PURPOSES – SCOPE OF WORK DEFINED IN 14220 & 14230

Any contradictions between University of Colorado Standards document 14210 and the reference scope of work documents (14220 & 14230) must be presented in writing for clarification purposes.

PART 1 GENERAL

1.01 WORK INCLUDED

A. Traction elevator(s) as follows:

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator installation required by Contract Documents.

C. Applicable conditions of General, Special, and Supplemental Conditions, and Division 1.

D. Warranty / Preventive maintenance as described herein.

E. Additional equipment or finishes furnished under other sections, installed under this section:
   1. Building announcement speaker(s) in Elevator cabs
   2. In car Firefighters’ telephone jack(s)
   3. CCTV system – If required
   4. Provisions for and mounting of Card reader security system-if required
   5. Car interior finishes
   6. Car finish flooring

1.02 RELATED WORK PROVIDED UNDER OTHER SECTIONS – PROVIDED BY OTHERS

A. Hoistway and Pit:
   1. Clear, plumb, substantially flush hoistway with variations not to exceed 1” at any point.
   2. Divider beams between adjacent elevators at each floor, pit, and overhead. Supports at each floor for car and counterweight guide rail fastening, including supports for car guide rail fastening above top landing. Intermediate car guide rail support when floor heights exceed 14’-0” or as designated on contract drawings. Intermediate counterweight guide rail supports where floor heights exceed 16’-0”. Building supports not to deflect in excess of 1/8” under normal conditions
   3. Hoist machine supports including two (2) additional horizontal supports above the top terminal landing on the machine side of the hoistway. Locate as required for selected Contractors’ equipment.
   4. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
   5. Cutting and patching walls and floors.
   6. Concrete wall pockets and/or structural steel beams for support of hoist machine, rope sheaves, and dead-end hitch beams. Support deflection shall not exceed 1/1666 of span under static load.
   7. Erect front hoistway wall after elevator entrances are installed.
   8. Grout floor up to hoistway sills and around hoistway entrances.
9. Lockable, self-closing, fire-rated pit door (walk in pits only)
10. Pit access stationary ladder for each elevator. Retractable ladder if provided shall include an electrical contact conforming to ASME A17.1, Rule 2.2.2.4.2.7.
11. Structural support at pit floor for buffer impact loads, guide rail loads.
12. Waterproof pit. Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3000 gallons per hour, per elevator.
13. Protect open hoistways and entrances during construction per OSHA Regulations.
14. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
15. Hoistway smoke relief venting.
16. Hoistway pressurization for smoke control. If required.
17. Hoist machine ventilation, heating, and/or cooling. Maintain minimum temperature of 55°F, maximum 90°F at the location of the hoist machine.
18. Seal fireproofing to prevent flaking.
19. Single Blind hoistway Rules - Provide emergency access door every third floor and maximum 36'-0" sill to sill. Minimum 28" wide x 80" high single slide or swing, self-closing and self-locking with key removable in locked position only. Mark room side of door with 2" high letters, "Danger: Elevator Hoistway." Door operable from hoistway side without key.
20. Finished Floor Covering: Unless otherwise specified, Provide Rubber tile 1/8" thick with 1" diameter by 0.025" raised circular pattern. Color to be determined

B. Machine Room:
   1. Enclosure with access.
   2. Self-closing and locking access door.
   3. Ventilation and heating. Maintain minimum temperature of 55°F, maximum 90°F. Maintain maximum 80% relative humidity, non-condensing.
   4. Paint walls and ceiling.
   5. Class "ABC" fire extinguisher in each elevator controller space.
   6. Seal fireproofing to prevent flaking.
   7. Fire sprinklers where required.

C. Electrical Service, Conductors, and Devices:
   1. Lighting and GFCI convenience outlets in pit, controller space, and overhead machinery spaces. Provide one additional non-GFCI convenience outlet in pit for sump pump.
   2. Provide compact fluorescent protected lighting fixtures, mounted vertically throughout the hoistway. Attain no less than 10 ft candles illumination in pit and hoistway, 19 ft candles in MRL machine space.
   3. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the controller space with protected lockable "open" disconnecting means.
   4. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable "open" disconnecting means located in the controller space.
   5. Emergency telephone line to each individual elevator control panel in elevator controller space.
   6. Fire alarm initiating devices in each elevator lobby for each group of elevators or single elevator and each controller space to initiate firefighters' return feature. Device at top of hoistway if sprinklered. Provide alarm initiating signal wiring from hoistway or controller space connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters' operation.
   7. Temporary power and illumination to install, test, and adjust elevator equipment.
8. Firefighters' telephone jack and announcement speaker in car with connection to individual elevator control panels in the controller space and elevator control panel in firefighters’ control room. If required.

9. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters’ control room and/or main control console. If required. Coordinate size, number, and location of conduits with Elevator Contractor.

10. Means to automatically disconnect power to affected elevator drive unit and controller prior to activation of the controller space fire sprinkler system, and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of the controller space. If sprinklers are required

11. When sprinklers are provided in the hoistway all electrical equipment, located less than 4'-0" above the pit floor shall be identified for use in wet locations. Exception: seismic protection devices.

12. Single-phase power feeders to main control console and firefighters’ control panel.

13. Single-phase power feeder to elevator intercom amplifier in the elevator controller space. If present.

14. Single-phase power feeder to each elevator controller in the controller space with protected, lockable “open” disconnecting means for car heating and air conditioning unit. If present.

15. Single-phase power feeders to controller(s) for CCTV with lockable “open” disconnecting means. If present.

D. Standby Power Provision: If present or required

1. Standby power of normal voltage characteristics via normal electrical feeders to run one elevator at a time in each elevator group and/or single elevator unit at full-contract car speed and capacity.

2. Conductor from auxiliary form "C" dry contacts, located in the standby power transfer switch to a designated elevator control panel in each elevator group and/or single elevator unit. Provide a time delay of 30 - 45 seconds for pre-transfer signal in either direction.

3. Standby single-phase power to group controller, and each elevator controller for car lighting, exhaust blower, emergency signaling device, intercom amplifier, hoist machine cooling fan, car heating and air conditioning unit.

4. Means for absorbing regenerated power during an overhauling load condition per NEC 620.91. Elevator(s) will employ IGBT drive, presenting a non-linear active load.

5. Standby power to machine room, pit, and overhead machinery space lighting.

6. Standby power to hoist machine and control room ventilation or air conditioning.

7. Standby power to emergency communications device(s).

1.03 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

C. Provisions of this specification are applicable to all elevators unless identified otherwise.

1.04 QUALITY ASSURANCE

A. Approved Contractors: Alternate Contractors must receive approval of the owner at least 14 calendar days prior to bid date.

1. Machine Roomless Gearless Elevator(s): ThyssenKrupp, KONE, Otis, Schindler, Global Tardiff, Imperial, Hollister Whitney, GAL, MCE
2. Car Enclosure: Eklund’s Inc., Gunderlin, Ltd., Hauenstein & Burmeister, ThyssenKrupp, KONE, Otis, Schindler, Tyler, Schumacher
3. Hoistway Entrance: Gunderlin, Hauenstein & Burmeister, ThyssenKrupp, KONE, Otis, Schindler, Tyler, Columbia

B. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following codes, laws, and/or authorities, including revisions and changes in effect:
   1. Safety Code for Elevators and Escalators, ASME A17.1
   2. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2
   3. Elevator and Escalator Electrical Equipment, ASME A17.5
   4. National Electrical Code, NFPA 70
   5. Americans with Disabilities Act, ADA
   6. Local Fire Authority
   7. Requirements of IBC, DSA, and all other Codes, Ordinances and Laws applicable within the governing jurisdiction
   9. Uniform Federal Accessibility Standard, UFAS
   10. University of Colorado at Boulder standards and practices

C. Warranty:
   1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one year from date of final acceptance of all work to satisfaction of Architect, Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.
   2. Defective is defined to include, but not limited to: operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.
   3. Make modifications, requirements, adjustments, and improvements to meet performance requirements in Parts 2 and 3.

1.05 DOCUMENT VERIFICATION

A. In order to discover and resolve conflicts or lack of definition which might create problems, Contractor must review Contract Documents for compatibility with its product prior to submittal of quotation. Purchaser will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Contractor’s equipment.

1.06 SUBMITTALS

A. Within 60 calendar days after award of contract and before beginning equipment fabrication, submit shop drawings and required materials for review as outlined in Division I. Allow 30 calendar days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of pit, hoistway and machine room indicating equipment arrangement, elevation section of hoistway, details of car enclosures, hoistway entrances, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   4. Fixtures: Cuts, samples, or shop drawings.
5. **Finish Material:** Submit 3” x 12” samples of actual finished material for Architect review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Provider. Include, if requested, signal fixtures, lights, graphics, Braille plates, and details of mounting provisions.

B. **Acknowledge and/or respond to review comments** within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Provider’s revision response time is not justification for equipment delivery or installation delay.

1.07 **PERMIT, TEST AND INSPECTION**

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.

B. Perform test required by Governing Authority in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative.

C. Supply personnel and equipment for test and final review, as required in Part 3.

1.08 **MAINTENANCE**

A. **Interim:**
   1. When one or more elevators are near completion and ready for service, the General Contractor may accept elevators for interim use and place in service prior to substantial completion of project, entirely at their own risk.
   2. During this period General Contractor may pay a mutually agreed upon monthly amount per elevator for preventive maintenance to the elevator contractor. Indicate amount per unit per month with quotation.
   3. Temporary acceptance form must be acceptable to General Contractor and signed prior to use.
   4. General Contractor must provide or pay for temporary hoistway and car enclosures; protect installed equipment and finishes; pay for and return elevators to elevator subcontractor for all cleaning, repairs, and replacement of materials necessary to restore elevator to “as-new” condition as determined solely by representatives of the University of Colorado prior to final acceptance.

B. **Warranty Maintenance:**
   1. Provide preventive maintenance and 24-hour emergency callback service for one year commencing on date of final acceptance by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator control room, hoistway, and pit in clean condition.
   2. Use competent personnel, acceptable to the Purchaser, supervised and employed by Contractor.
   3. The warranty maintenance period specified in Item 1 above shall be extended one (1) month for each three (3) month period in which equipment related failures average more than .25 per unit per month.
   4. Purchaser retains the option to delete cost of warranty maintenance from new equipment contract and remit twelve (12) equal installments directly to Contractor during period in which maintenance is being performed.
   5. Use competent personnel, acceptable to the Purchaser, employed and supervised by Contractor.
PART 2 PRODUCTS

2.01 MATERIALS

A. Steel:

B. Stainless Steel: Type 302 or 304, complying with ASTM A167, with standard tempers and hardness required for fabrication, strength and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Architect’s sample. Protect with adhesive paper covering.
   1. No. 4: Directional polish (satin finish). Graining directions as shown or, if not shown, in longest dimension.
   2. No. 8: Reflective polish (mirror finish).
   3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).

C. Bronze: Stretcher-leveled, re-squared sheets composed of 60% copper and 40% zinc similar to Muntz Metal, Alloy Group 2, with standard temper and hardness required for fabrication, strength, and durability. Clean and treat bronze surfaces before mechanical finish. After completion of the final mechanical finish on the fabricated work, use a chemical cleaner to produce finish (Federal Standard and NAAMM nomenclature) matching Architect’s sample:
   1. No 4 Satin: Directional polish finish. Fine-satin clear-coated with clear-organic coating recommended by Fabricator. Provide graining direction as shown or, if not shown, in longest dimension.
   2. No. 8 Mirror: Reflective polish finish with no visible graining. Bright-polished clear-coated finish with clear-organic lacquer coating recommended by Fabricator.
   3. Acid-Etched Pattern: Provide a No. 8 mirror reflective-polished background with selectively acid-etched, matte-textured, custom pattern as shown. Acid selection and dilution (if required) recommended by Fabricator. After final finishing, coat bronze with clear-organic lacquer coating recommended by Fabricator.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LD3.1, Fire-Rated Grade (GP-50), Type 7, 0.050” ± .005” thick, color and texture as follows:
   1. Exposed Surfaces: Color and texture selected by Architect.
   2. Concealed Surfaces: Contractor’s standard color and finish.

F. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

G. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.
H. Baked Enamel Finish: Prime finish per above. Unless specified “prime finish” only, apply and bake three (3) additional coats of enamel in the selected solid color.


2.02 CAR AND GROUP PERFORMANCE

A. Car Speed: ± 3% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop and hold 125% of rated load.

C. Car Stopping Zone: ±1/4” under any loading condition.

2.03 OPERATION

A. Approved non-proprietary microprocessor-based elevator controls and landing systems are as follows;
   1. Computerized Elevator Controls Corporation
   2. Elevator Controls Corporation
   3. Motion Control Engineering
   4. SmartRise
   5. Galaxy
   6. Original Equipment Manufacturers
      a. Major Manufacturers equipment may be substituted with documentation confirming strict adherence to Section 14215, 3.08, A, 1-9.
         1) KONE, Otis, ThyssenKrupp, Schindler

B. Selective Collective Microprocessor Based (Car(s)):
   1. Operate car without attendant from pushbuttons in car and located at each floor. When car is available, automatically start car, and dispatch it to floor corresponding to registered car or hall call. Once car starts, respond to registered calls in direction of travel and in the order the floors are reached.
   2. Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of car and corresponding to the direction of car travel have been answered.
   3. Slow car and stop automatically at floors corresponding to registered calls, in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.
   4. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is highest (or lowest) call registered.
   5. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

C. Duplex Selective Collective Microprocessor-Based, Car(s):
   1. Operate cars without attendants from pushbuttons in cars and located at each floor. When cars are available, park one car at main floor (“home” car). Park other car where last used (“free” car).
   2. Respond to car calls and hall calls above main floor using the free car. Once a car has started, respond to registered calls in the direction of travel and in the order the floors are reached.
3. Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of the car and corresponding to the direction of car travel have been answered.

4. Slow cars and stop automatically at floors corresponding to registered calls in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.

5. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is the highest (or lowest) call registered.

6. When the free car is clearing calls, start home car to respond to:
   a. A call registered on home car pushbuttons.
   b. An up hall call registered below free car.
   c. An up or a down call registered above free car while free car is traveling down.
   d. A hall call when free car is delayed in its normal operation for a predetermined period.

7. When both cars are clearing calls, stop only one car in response to any registered hall call. Return the first car to clear its calls to main floor. Should last service required bring both cars to main floor, the first arriving car becomes the free car.

8. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

D. Group Automatic, Car(s)
   1. Include, as a minimum, the following features:
      a. Operate cars as a group capable of balancing service and providing continuity of group operation with one or more cars removed from the system.
      b. Register service calls from pushbuttons located at each floor and in each car. Slow cars and stop automatically at floors corresponding to registered calls. Make stops at successive floors for each direction of travel irrespective of order in which calls are registered except when bypassing hall calls to balance and improve overall service; stop only one car in response to a particular hall call. Assign hall calls to specific cars and continually review and modify those assignments to improve service. Simultaneous to initiation of slowdown of a car for a hall call, cancel that call. Render hall pushbutton ineffective until car doors begin to close after passenger transfer. Cancel car calls in the same manner. Give priority to coincidental car and hall calls in car assignment.
      c. Operate system to meet changing traffic conditions on a service demand basis. Include provisions for handling traffic which may be heavier in either direction, intermittent or very light. As traffic demands change, automatically and continually modify group and individual car assignment to provide the most-effective means to handle current traffic conditions. Provide means to sense long-wait hall calls and preferentially serve them. Give priority to coincidental car and hall calls in hall call assignment. Accomplish car direction reversal without closing and reopening doors.
      d. Use easily reprogrammable system software. Design basic algorithm to optimize service based on equalizing system response to registered hall calls and equalizing passenger trip time to shortest possible time.
      e. Serve floors below main floor in a manner which logically minimizes delay in passing or stopping at main floor in both directions of travel. Provide manual means to force a stop at the main floor when passing to or from lower levels.
      f. Required Features:
         1) Dispatch Protection: Backup dispatching shall function in the same manner as the primary dispatching.
         2) Delayed Car Removal: Automatically remove delayed car from group operation.
3) Position Sensing: Update car position when passing or stopping at each landing.
4) Hall Pushbutton Failure: Provide multiple power sources and separate fusing for pushbutton risers.
5) Communication link: Provide serial or duplicate communication link for all group and individual car computers.

E. Other Items:
1. Load Weighing: Provide means for weighing car passenger load. Control system to provide dispatching at main floor in advance of normal intervals when car fills to capacity. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. Field adjustment range: 10% to 100%.
2. Anti-Nuisance Feature: If car loading relative to weight in car is not commensurate with number of registered car calls, cancel car calls. Systems employing either load weighing or door protective device for activation of this feature are acceptable.
3. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.
4. Key requirements for all key operated devices must conform to the University master key plan, Medco brand.

F. Firefighters' Service: Provide equipment and operation in accordance with Code requirements.

G. Automatic Car Stopping Zone: Stop car within 1/4" above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, distance between landings, hoist rope slippage or stretch.

H. Remote Monitoring and Diagnostics: Equip each controller with standard ports, interface boards, and drivers to accept maintenance, data logging, fault finding diagnostic, and monitoring computers, keyboards, modems, and programming tools. The system shall be capable of driving remote color LCD monitor(s) that continually scan and display the status of each car and call.

I. Motion Control: Microprocessor based AC, variable-voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation, and dynamic braking. Limit the difference in car speed between full load and no load to not more than ±3% of the contract speed.

J. Selective Leveling: Provide means to limit elevator car speed when traveling between adjacent floors.

K. Passenger Door Operation: Automatically open doors when car arrives at main floor. At expiration of normal dwell time, close doors. Reopen doors when car is designated for loading. Provide front or rear selective door operation for front and rear application.

L. Power Freight Door Operation: Open door and gate automatically when car arrives at a floor. Control door and gate closing by using constant-pressure buttons on car or at each floor. Provide passenger sequence operation. Provide reversing safety edge device on car gate. Provide automatic door and gate closing feature with warning buzzer.

M. Standby Lighting and Alarm: Car mounted battery unit with solid-state charger to operate alarm bell and car emergency lighting. Battery to be rechargeable with minimum 5-year life
expectancy. Include required transformer. Provide constant pressure test button in service compartment of car operating panel. Provide lighting integral with portion of normal car lighting system.

N. Standby Power Operation: If provided or required
1. Upon loss of normal power, adequate standby power will be supplied via building electrical feeders to simultaneously start and run one car in each group and single cars at contract car speed and capacity.
2. Automatically return one car at a time, in each group and single car(s), nonstop to designated floor, open doors for approximately 3.0 seconds, close doors, and park car. During return operation, car and hall call pushbuttons shall be rendered inoperative. As each car parks, system shall immediately select the next car until all cars in a group have returned to the designated floor. If a car fails to start or return within 30 seconds, system shall automatically select the next car in the group to automatically return.
3. When all cars in a group have returned to the designated floor, one car in each group shall be designated for automatic operation. When a service demand exists for 30 seconds and designated car fails to start, next available car in the group shall be automatically selected for operation.
4. Provide separate group selection switch(es) in firefighters’ control panel and security control panel. If required.
   a. Switch(es) shall be labeled “STANDBY POWER OVERRIDE” with positions marked “AUTO” and appropriate car numbers controlled by each respective switch. Key shall be keyed same as key utilized for firefighters’ Phase I and II key switch. Key shall be removable in “AUTO” position only.
   b. Switch shall override automatic return and automatic selection functions, and cause the manually selected car to operate. Manual selection shall cause car to start and proceed to designated floor and open and close its doors before standby power is manually transferred to next selected car.
   c. Provide “STANDBY POWER” indicator lights, one per car, in firefighters’ control panel and security control panel. Indicator light illuminates when corresponding car is selected, automatically or manually, to operate on standby power.
5. Successive Starting: When normal power is restored or there has been a power interruption, individual cars in each bank shall restart at five second intervals.

2.04 MACHINE ROOM EQUIPMENT

A. Arrange equipment in spaces shown on drawings.

B. Geared Traction Hoist Machine:
1. Single worm geared or helical geared traction type with AC induction or P.M.S.M. ACV3F motor, brake, gear, drive shaft, deflector sheave, and gear case mounted in proper alignment on an isolated bedplate. Provide bedplate blocking to elevate secondary or deflector sheave above machine room floor.
2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
3. Provide hoist machine drip pans to collect lubricant seepage.
4. Provide machine bedplate mounted deflector sheave A-frame or supporting steel beams and fastenings to mount deflector sheaves to building structure. Provide minimum 16 gauge easily removable sound insulated sheet metal closures in hoistway wall opening around machine (when machine is shown as effect as below).
5. Provide ladders and platforms with handrails and toeboards for overhead sheave access within the bounds of the machine room.
C. Gearless Traction Hoist Machine:
1. AC induction or P.M.S.M. ACV3F gearless traction type motor with brake, drive sheave, and deflector sheave mounted in proper alignment on a common, isolated bedplate. Provide bedplate blocking to elevate secondary or deflector sheave above machine room floor.
2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
3. Provide machine bedplate mounted deflector sheaves or supporting steel beams and fastenings to mount deflector sheaves to building structure. Provide minimum 16 gauge easily removable sound insulated sheet metal closures in hoistway wall opening around machine (when machine is shown as effect as below).
4. Provide ladders and platforms with handrails and toeboards for overhead sheave access within the bounds of the machine room.

D. Solid State Power Conversion and Regulation Unit: Provide solid-state, alternating current, variable voltage, variable frequency (ACV3F), I.G.B.T. converter/inverter drives.
1. Design unit to limit current, suppress noise, and prevent transient voltage feedback into building power supply. Provide internal heat sink cooling fans for the power drive portion of the converter panels. Conform to IEEE standards 519-1992 for line harmonics and switching noise.
2. Isolate unit to minimize noise and vibration transmission. Provide isolation transformers, filter networks, and choke inductors.
3. Suppress solid-state converter noises, radio frequency interference, and eliminate regenerative transients induced into the mainline feeders or the building standby power generator.
4. Supplemental direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, etc., from separate static power supply.
5. ACV3F Drives for gearless elevators shall be regenerative and utilize IGBT converter/inverter and dynamic braking during overhauling condition.

E. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

F. Controller: UL/CSA labeled.
1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
3. Microprocessor-Related Hardware
   a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
   b. Provide power supplies with noise suppression devices.
   c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
   d. Design control circuits with one leg of power supply grounded.
   e. Safety circuits shall not be affected by accidental grounding of any part of the system.
   f. System shall automatically restart when power is restored.
   g. System memory shall be retained in the event of power failure or disturbance.
   h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.

5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.

6. Monitoring System Interface: Provide controller with serial data link through RJ45 Ethernet connection and install all devices necessary for monitoring function. Elevator contractor responsible to connect monitoring system interface to machine room monitoring compartment and LAN. Wiring from the LAN to the machine room monitoring compartment by others.

7. Provide controller or machine mounted auxiliary, lockable “open” disconnect if mainline disconnect is not in sight of controller and/or machine.

G. Sleeves and Guards: Provide 2” steel angle guards around cable or duct slots through floor slabs and/or walls. Provide rope and smoke guards for sheaves, cables, and cable slots in control room and secondary machinery levels.

H. Noise/Vibration Isolation: All elevator equipment including their supports and fastenings to building, shall be mechanically and electrically isolated from the building structure and main line power feeders to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.

I. Sound Isolation:
   1. Noise level relating to elevator equipment operation in machine room shall not exceed 80 dBA.
   2. All dBA readings shall be taken three (3) feet off the floor and three (3) feet from equipment using the “A” weighted scale.

J. Governor: Centrifugal-type, car driven with pull-through jaws and bi-directional shutdown switches. Provide required bracketing and supports for attachment to guide rail or machine support frame.

K. Emergency Brake: Provide means to prevent ascending car over-speed and unintended

2.05 HOISTWAY EQUIPMENT

A. Guide Rails: Planed steel T-sections for car and counterweight of suitable size and weight for the application including brackets for attachment to building structure. Provide rail backing and intermediate counterweight tie brackets to meet Code requirements. No additional structural points of rail attachment, other than those shown on the Contract Documents, will be provided.

B. Buffers, Car and Counterweight: Oil type with blocking and support channels. Provide switch on buffer to limit car speed if buffer is compressed.

C. Sheaves: Machined grooves and sealed bearings. Provide mounting means to machine beams, machine bedplate, car and counterweight structural members, or building structure.

D. Counterweight: Steel frame with metal filler weights.


F. Counterweight Guard: Metal guard in pit
G. Governor Rope and Encoder Tape Tensioning Sheaves: Mount sheaves and support frame on pit floor or guide rail. Provide frame with guides or pivot point to enable free vertical movement and proper tension of rope and tape.

H. Hoist and Governor Ropes:
1. 8 x 19 or 8 x 25 Seale construction, traction steel type. Fasten with staggered length, adjustable, spring isolated wedge type shackles.
2. Governor rope to suit Provider’s specification.

I. Compensation: Provider’s standard application. Pit mounted guide assembly shall provide quiet, effective restraint without excessive wear of components. Inhibit rubbing or chafing against hoistway or equipment within hoistway or pit. Application must meet performance/noise level requirement of specification.


K. Electrical Wiring and Wiring Connections:
1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide 4 pairs of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.
2. Conduit: Painted or galvanized steel conduit, EMT or duct. Conduit size, 1/2”.
Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
4. Auxiliary Wiring: Connect fire alarm initiating devices, emergency two-way communication system in each car controller in machine room.

L. Passenger Entrance Equipment:
1. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
2. Door Tracks: Bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
3. Door Interlocks: Operable without retiring cam. Paint interlock box flat black.
4. Door Closers: Spring, spirator, or jamb/strut mounted counterweight type. Design and adjust to insure smooth, quiet mechanical close of doors.
5. Hoistway Door Unlocking Device: Provide unlocking device with escutcheon in door panel at all floors, with finish to match adjacent surface.
6. Hoistway Access Switches: Mount in wall at top and bottom floor(s). Provide switch with faceplate.

M. Vertical Freight Bi-Parting Doors - Entrance Equipment:
1. Door Guide Tracks: Continuous steel angles or formed steel tracks fastened to hoistway door jamb.
2. Door Guide Shoes: Machined iron shoes. Four shoes per door panel, with not less than 2-1/2” lateral contact per shoe.
3. Door Interlocks: Operable without retiring cam.
4. Hoistway Door Unlocking Device: Provide unlocking device with pull chain under hinged, lockable cover with stainless steel No. 4 finish at all floors.
N. Floor Numbers: Stencil paint 4” high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.06 HOISTWAY ENTRANCES

A. Complete entrances bearing fire labels from a nationally recognized testing laboratory approved within the governing jurisdiction.

B. Frames: 14 gauge hollow metal at all floors. Bolted and lapped head to jamb assembly at all floors. Provide Arabic floor designation/Braille plates, centered at 60” above finished floor, on both side jambs of all entrances. Provide plates at main egress landing with “Star” designation. For designated emergency car, provide “Star of Life” designation plates at height of 78” – 84” above finished floor on both side jambs at all floors. Braille indications shall be below Arabic floor designation. Provide cast floor designation/Braille plates as manufactured by SCS, Vision Mark, or Entrada.

C. Door Panels: Minimum 18 gauge steel, sandwich construction without binder angles. Provide leading edges of center-opening doors with rubber astragals. Provide a minimum of two (2) gib per panel, one at leading and one at trailing edge with gib in the sill groove entire length of door travel. Construct door panels with interlocking, stiffening ribs.

D. Sight Guards: Minimum 16 gauge, same material and finish as hoistway entrance door panels. Construct without sharp edges.

E. Sills: Extruded nickel silver

F. Sill Supports: Structural or formed steel designed to support door sill based upon car loading classification. Mount to eliminate need for grout under the sill.

G. Service Elevators: Provide 5” x 5” x 1/2” cold-rolled structural steel angle, extending full width of hoistway. Fasten to building structure at maximum 18” O.C.

H. Fascia, Toe Guards and Hanger Covers: Minimum 16 gauge furniture steel with black enamel. Provide full height fascia, toe guards, and hangar covers where rear entrances are not provided. Provide front and/or rear fascia for express hoistway travel.

I. Struts and Headers: Provide for vertical support of entrances and related material. Provide door open bumpers on entrances equipped with vertical struts.

2.07 CAR EQUIPMENT

A. Frame: Welded or bolted, rolled or formed steel channel construction to meet load classification specified.

B. Safety Device: Type “B,” flexible guide clamp.

C. Platform: Isolated type, constructed of steel, or steel and wood which is fireproofed on underside. Design and construct to accommodate load classification requirements. Provide Class “A” construction for passenger elevators, Class “A” construction for service elevator, Class “C” construction for freight elevator.

D. Platform Apron: Minimum 16 gauge steel, reinforced and braced to car platform with black enamel.
E. Guide Shoes: Roller type with three or more spring dampened, sound-deadening rollers per shoe. Maximum roller rotation speed, 350 r.p.m.

F. Sills: One piece extrusion with extruded extension between car entrance columns to face of car front return. Extruded extension to match finish of sill.

G. Doors: Provide as specified for hoistway entrance doors.

H. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

I. Door Track: Bar or formed, cold-drawn removable steel track with smooth roller contact surface.

J. Door Header: Construct of minimum 12 gauge steel, shape to provide stiffening flanges.

K. Door Electrical Contact: Prohibit car operation unless car door is closed.

L. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.

M. Restricted Opening Device: Restrict opening of car door(s) outside unlocking zone.

N. Passenger / Service Door Operator: High speed, heavy-duty closed loop door operator capable of opening doors at no less than 2-1/2 f.p.s. Accomplish reversal in no more than 2-1/2" of door movement. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Maintain consistent, smooth, and quiet door operation at all floors, regardless of door weight or varying air pressure.

Acceptable closed-loop door operators:

1. G.A.L. MOVFR
2. Elevator Components Industries ECI 2000
3. Motion Control Engineer SmarTraq
4. Original Equipment Manufacturers
   a. Major Manufacturers equipment may be substituted with documentation confirming strict adherence to Section 14215, 3.08, A, 1-9.
      1) KONE, Otis, ThyssenKrupp, Schindler

O. Passenger / Service Door Control Device:

1. Infrared Reopening Device: Black, fully enclosed device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. Device shall prevent doors from closing and reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudge operation. In event of device failure, provide for automatic shutdown of car at floor level with doors open.
   a. Acceptable Infrared Reopening Device:
      1) Cegard/MAX-154 by CEDES
      2) Gatekeeper by Adams
      3) Lambda II by Otis
      4) Magic Edge by Tri-Tronics
      5) Microlite by ThyssenKrupp
6) Microscan E by T.L. Jones
7) Pana40 Plus by Janus

b. Acceptable Infrared 3D Reopening Device:
   1) Cegard/MAX-154 by CEDES
   2) Gatekeeper by Adams
   3) Lambda 3D by Otis
   4) Microlite 3D by ThyssenKrupp
   5) Pana40 Plus 3D by Janus

2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0 - 25.0 seconds), warning signal shall sound and doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override nudging operation and reopen doors.

3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0 - 1.5 seconds after beams are reestablished.

4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
   a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

P. Car Operating Panel:
   1. Car operating panel(s) without faceplate(s), consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car swing front return panel(s).
   2. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with SCS, Visionmark, or Entrada cast tactile symbols recessed flush rear mounted. Configure plates per local building code accessibility standards including Braille. Locate operating controls no higher than 48” above the car floor; no lower than 35” for emergency push-to-call button and alarm button.
   3. Provide minimum 3/4” diameter raised floor pushbuttons which illuminate to indicate call registration.
   4. Provide alarm button to ring bell located on car. Illuminate button when actuated.
   5. Provide keyed stop switch at bottom of car operating panel in locked car service compartment. Mark device to indicate “run” and “stop” positions.
   6. Provide “door open” button to stop and reopen doors or hold doors in open position.
   7. Provide “door close” button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
   8. Provide “door hold” Button
   9. Provide firefighters’ Phase II key switch with engraved instructions filled red. Include light jewel, audible signal, and call cancel button.
   10. Install firefighters’ telephone jack with bezel matching adjacent controls if required.
   11. Provide lockable service compartment with recessed flush door. Door material and finish shall match car return panel or car operating panel faceplate
   12. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
       a. Inspection switch.
       b. Light switch.
       c. Three-position exhaust blower switch.
       d. Independent service switch.
       e. Constant pressure test button for battery pack emergency lighting.
       f. 120-volt, AC, GFCI protected electrical convenience outlet.
g. Card reader override switch.
h. Stop switch.

13. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters’ operating instructions on main operating panel above corresponding keyswitch filled red.
   b. Car number on main and auxiliary car operating panel.
   c. “Certificate of Inspection on File in Building Office” on main car operating panel.
   d. “No Smoking” on main car operating panel.
   e. Car capacity in pounds on service compartment door.

Q. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

R. Work Light and Duplex Plug Receptacle: GFCI protected outlet at top of car. Include on/off switch and lamp guard.

S. Communication System:
   1. “Push to Call,” two-way communication instrument in car with automatic dialing, tracking, and recall features with shielded wiring to car controller in control room. Provide dialer with automatic rollover capability with minimum two numbers.
      a. “Push to Call” button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL,” “HELP ON THE WAY” engraved signage adjacent to button.
      b. Provide “Push to Call” button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.
   2. Firefighters’ telephone jack in car and firefighters’ panel, with four shielded wires to control room junction box. Jack bezel shall match adjacent controls if required.
   3. Install remote speaker(s) in car behind front return panel with drilled speaker pattern, with shielded wiring to control room junction box if required.

2.08 CAR ENCLOSURE

A. Car Enclosure Passenger Elevator: Provide complete as specified herein and/or detailed on architectural drawings. Provide the following features.
   1. Shell: Reinforced minimum 16 gauge furniture steel formed panels with baked enamel interior finish as selected. Apply sound-deadening mastic to exterior.
   2. Canopy: Reinforced 12 gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
   3. Front Return Panels and Integral Entrance Columns: Reinforced minimum 16 gauge stainless steel satin finish. Swing entire unit on substantial pivot points (minimum 3) for service access to car operating panel(s). Locate pivot points to provide full swing of front return panel without interference with side wall finish or handrail. Secure in closed position with concealed three-point latch. Provide service compartment with recessed flush cover and cutouts for operating switches, etc.
   4. Entrance Columns: Reinforced minimum 16 gauge stainless steel satin finish.
   5. Transom: Reinforced minimum 16 gauge stainless steel satin finish full width of enclosure
   8. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected.
9. Ventilation: Two-speed type mounted to car canopy on isolated rubber grommets. Exhaust blower shall meet requirements of Item 2.04, F.


11. Handrails: Minimum 1-1/4" diameter stainless steel tubular grab bar across rear wall.

B. Car Enclosure Service Elevator: Provide complete as specified herein. Provide the following features.

1. Shell: Reinforced minimum 16 gauge textured stainless steel formed panels as specified. Apply sound deadening mastic to exterior.

2. Canopy: Reinforced 12 gauge furniture steel formed panels with lockable hinged emergency exit. Interior finish white reflective baked enamel.

3. Front Return Panels: Reinforced minimum 16 gauge stainless steel, satin finish as specified.

4. Entrance Columns and Transom: Reinforced minimum 16 gauge, stainless steel, satin finish.

5. Car Door Panels: Reinforced minimum 18 gauge stainless steel textured finish as specified in Item 2.02. Same construction as hoistway door panels. Architectural metal cladding shall wrap around leading and trailing edge of panel and return a minimum of 1/2" on rear side of leading edge of panels.

6. Ventilation: Two-speed exhaust blower mounted to car canopy on isolating rubber grommets. Provide with a diffuser and grille. Exhaust blower shall meet requirements of Item 2.03, H.

7. Lighting: Fluorescent fixture flush mounted in ceiling with protective diffuser and steel guard over fixtures on car top.

8. Handrails/Guardrails: Two lines. Top handrail line minimum 1-1/4" diameter stainless steel tubular grab bar. Lower guardrail line 4" x 3/8" solid stainless steel flatstock bars mounted on both sides and rear of the car. Locate bottom guardrail line at 8" above car floor and handrail line at 32" above the car floor. Bolt rails through car walls from back and mount on 1-1/2" deep solid round stainless steel standoff spacers no more than 18" O.C. Return handrail/guardrail ends to car walls.

9. Finished Floor Covering: Rubber tile 1/8" thick with 1" diameter by 0.025" raised circular pattern.

C. Car Enclosure Freight Elevator: Provide complete as specified herein. Provide the following features.

1. Shell: Reinforced 10 gauge furniture steel formed panels no more than 20" wide with light-proof joints. Baked enamel finish as selected. Reinforce and brace panels to provide rigid structure and securely fasten to car sling and platform. Provide recess in car side wall for recessed mounting of car operating panel.

2. Canopy: Reinforced 12 gauge furniture steel formed panels no more than 20" wide with light-proof joints. Interior finish white reflective baked enamel. Provide hinged emergency exit.

3. Lighting: Recessed 4-tube fluorescent fixtures with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.

D. Bumper Rails: Two (2) rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car. Locate bottom rail at floor level and top rail at 36" above the car floor. Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections.
2.09 HALL CONTROL STATIONS

A. Pushbuttons: Provide number of riser(s) with flush or surface mounted faceplates per architectural drawings. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Pushbutton design shall match car operating panel pushbuttons.

B. Provide an illuminated signal marked “Elevator Emergency Power” to indicate emergency or standby power is in effect. If emergency power is present

C. Provide vandal resistant pushbutton and light assemblies.

2.10 SIGNALS

A. Passenger Car(s): Provide at each entrance to indicate travel direction of arriving car. Illuminate up or down LED lights and sound tone once for up and twice for down direction prior to car arrival at floor. Sound level shall be adjustable from 20 - 80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor. Illuminate light until the car doors start to close. Provide advanced hall lantern notification to comply with ADA hall call notification time. Car direction lenses shall be arrow shaped with faceplates. Lenses shall be minimum 2-1/2" in their smallest dimension. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Locate fixture in each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel. Provide multi-numeral vandal resistant indicator and light assemblies.

C. Faceplate Material and Finish: Stainless steel Satin finish all fixtures unless otherwise specified

D. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

E. Voice Synthesizer: Provide electronic device with easily reprogrammable message and female voice to announce car direction, floor, emergency exiting instructions, etc.

F. Firefighters’ Control Panel: IF REQUIRED: Locate in building fire control room. Fixture faceplate, stainless steel satin finish, including the following features:
   1. Car position and direction indicator (digital-readout or color SVGA display type). Identify each position indicator with car number
   2. Indicator showing operating status of car.
   3. Manual car standby power selection switch(es) and power status indicators.
   4. Two-position firefighters’ emergency return switch(es) and indicators with engraved instructions filled red.
   5. Firefighters’ telephone jack.

Fixtures and monitor shall be located as directed by Architect / Owner. Where applicable, identify all indicators and manual switches with appropriate engraving. Provide wiring to control panel.
G. Firefighters’ Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

2.11 INTERCOM AND DISTRESS SIGNAL SYSTEM

A. Cars with a travel > 60'-0" require additional two way communication to master control panel for emergency personnel

B. General: Provide intercommunication system. Include all wiring between elevator hoistways and control panels.

C. Basic Equipment:
1. Amplifier providing static-free voice transmission with adequate volume and minimum distortion at all stations, with pre-amplifier capable of receiving voice and music inputs from building and emergency building communication system.
2. Activation of emergency building communication system overrides all other conversations and permits one-way conversation to all master stations in system.
3. Master Stations:
   a. Speaker-microphone combination and/or handset for two-way communication.
   b. Selection buttons to enable communication with all master stations. Maintain continual reception of hands-free reply from station when a selected button is depressed.
   c. Two-Position “Talk/Listen” Button: Press to talk; release to listen.
   d. Illuminate “in use” light when any master station is being used.
   e. Reset button to make system available for use by any master station.
   f. Volume control knob for adjustment of incoming volume.
   g. Button to establish communications with all stations.
   h. Distress light in lobby panel which illuminates when “push to call” button, or alarm button in car is actuated. Energize distress light and buzzer or chime until intercom selection button for that car has been depressed. Sound buzzer or chime in lobby panel simultaneously with illumination of distress light.
4. Remote Stations:
   a. Station in car shall be activated by “push to call,” two-way communication button. “Push to call” button shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase “PUSH TO CALL,” “HELP ON THE WAY” engraved signage adjacent to button. Provide “push to call” button tactile symbol, engraved signage, and Braille adjacent to button.
   b. Locate car microphone and speaker or transceiver/speaker combination in car canopy behind front return panel with drilled speaker pattern, with shielded wiring to control room junction box.

D. Station Housings:
1. House master station at direction or owner in a metal compartment with baked enamel finish. Attach to the group elevator supervisory control panel or wall mount. Provide communication handset with 25'-0" long cord.
2. Provide control center master intercoms with stainless steel satin finish faceplates and engraved operating instructions. Coordinate faceplate size and installation of units with building Console Supplier.

2.12 MONITORING CAPABILITIES

A. Elevator controls must be capable of being monitored by monitoring systems as determined by the University of Colorado Facilities Management
PART 3 EXECUTION

3.01 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment examine hoistway and control room areas. Verify no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.02 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Contractor's original unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

3.03 INSTALLATION

A. Install all equipment in accordance with Contractor's instructions, referenced codes, specification, and approved submittals.

B. Install control room equipment with clearances in accordance with referenced codes and specification.

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

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   2. Control room equipment, hoistway equipment including guide rails, guide rail brackets, and pit equipment.
   3. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

3.04 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.05 ADJUSTMENTS

A. Install rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure joints without gaps and file any irregularities to a smooth surface.
B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Contractor’s instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.06 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.

C. Clean control room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating, and signal fixtures.

3.07 ACCEPTANCE REVIEW AND TESTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators, and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, and placed into operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant’s final review. Work shall be considered ready for Consultant’s final contract compliance review when all Contractor’s tests are complete and all elements of work or a designated portion thereof are in place and elevator or groups of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Consultant’s review. Notify Consultant a minimum of five (5) working days in advance when ready for final review of elevator or group.

D. Consultants’ written list of observed deficiencies of materials, equipment, and operating systems will be submitted to Contractor for corrective action. Consultant’s review shall include as a minimum:

1. Workmanship and equipment compliance with Contract Documents.


3. Performance of following is satisfactory:
   a. Starting, accelerating, running
   b. Decelerating, stopping accuracy
   c. Door operation and closing force
   d. Equipment noise levels
   e. Signal fixture utility
   f. Overall ride quality
   g. Performance of door control devices
   h. Operations of emergency two-way communication device
   i. Operations of firefighters’ service
4. **Test Results:**
   a. In all test conditions obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Purchaser and Consultant. Tests shall be conducted under both no load and full load condition.
   b. Temperature rise in motor windings limited to 50° Celsius above ambient. A full-capacity one (1) hour running test, stopping at each floor for ten (10) seconds in up and down directions, may be required.

E. **Performance Guarantee:** Should Consultant’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows:
   1. Replace equipment that does not meet code or Contract Document requirements.
   2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

3.08 **PURCHASER’S INFORMATION**

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of “as-installed” elevator circuits with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator control room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser’s property.
      a. Provide one (1) electronic copy of all required documentation
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Lubrication instructions including recommended grade of lubricants.
   4. Parts catalogs for all replaceable parts including ordering forms, price lists and ordering instructions.
   5. Four sets of keys for all switches and control features properly tagged and marked.
   6. Diagnostic test devices together with all supporting information / documentation necessary for interpretation of test data, fault code interpretation, manufacturers acronym definitions, adjustment parameters, troubleshooting of elevator system, and performance of routine safety tests.
   7. The elevator installation shall be a design that can be maintained by any licensed elevator maintenance company employing journeymen mechanics, or University of Colorado qualified elevator maintenance personnel without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
a. At the request of the University of Colorado, Provide 8 hours of onsite controller diagnostic training to University of Colorado qualified elevator maintenance personnel.
b. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid state elevator controller.
c. Provide a separate, detachable device, as required to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
d. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

8. Provide software upgrades and/or revisions during progress of the work, warranty period and a term of 10 years from the date of substantial completion.

END OF SECTION