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B. Work: The work shall include, but not be limited to the following for Elevators **<Insert Elevator Numbers>**.

1. An electric traction passenger elevator(s), complete with electrically operated geared traction machine, overspeed safety, overspeed gov-12.1en8d (Tc -0.0013.-6.4(s)-8.1(om)T

a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
b. Divider beams.
c. Hoist beams.
d. Structural-steel shapes for subsills.

5. Section 055000 "Metal Fabrications" for the following:

a. Attachment plates and angle brackets for supporting guide-rail brackets.
b. Divider beams.
c. Hoist beams.
d. Structural-steel shapes for subsills.
e. Pit ladders.
f. Cants in hoistways made from steel sheet.

6. Section 055213 "Pipe and Tube Railings" for railings between adjacent elevator pits.
7. <**Insert Section number**>-<**Insert Section title**> for finish flooring in elevator cars.
8. Section 102213 "Wire Mesh Partitions" for guards between adjacent elevator pits.
9. Section 221429 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits.
10. Section 271500 "Communications Horizontal Cabling" for telephone service for elevators[**and for Internet connection to elevator controllers for remote monitoring of elevator performance**].
11. [**Section 283111 "Digital, Addressable Fire-Alarm System"**] [**Section 283112 "Zoned (DC Loop)**] Fire-Alarm System" for smoke detectors in elevator lobbies to initiate emergency recall operation[**and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation**] and for connection to elevator controllers.

1.3 DEFINITIONS

A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.

1.4 CODES AND STANDARDS (EVANSTON CAMPUS)

A. General: Contractor shall comply with most-stringent applicable provisions of the following Codes, Standards and Laws, including revisions and changes in effect on date of these specifications.

B. Elevator:

1. ASME A17.1 - Safety Code for Elevators and Escalators.
2. ASME A17.3 - Safety Code for Existing Elevators and Escalators.
3. Illinois Elevator Safety and Regulation Act.

C. Electrical:

1. NFPA 70 - National Electrical Code.
2. NEMA - National Electrical Manufacturers Association.
3. Evanston Electrical Code.

D. Building:

1. International Building Code.
2. Evanston Building Code.

E. Life Safety:

1. NFPA 101 - Life Safety Code.
2. Evanston Fire Department.

F. Handicapped Accessibilbi 31 e( ) Td ( )Type /Pagination >>BDC /CS0 c0.00-Rt

1.6 ACTION SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.

1. Power Data: Contractor shall provide electrical calculations for all three-phase and single-phase feeder requirements. The electrical calculations shall include full load maximum current, cab lighting current, in-rush current and maximum heat loads.
2. Test Data: Contractor shall provide certified laboratory test reports on components as specified or required by referenced codes.

B. Shop Drawings:

1. Machine room plan indicating equipment sizes, location of equipment and location of electrical s pro ysy gl -0d locateno -74 Tc Tj

D. Adjuster's Test Reports: Contractor shall provide one (1) complete report and two (2) complete electronic reports with all controller settings, parameters and adjustments, along with all data from all tests performed. All settings and adjustments shall be noted.

E. Maintenance Manuals: Contractor shall provide one (1) neatly bound manual and two (2) electronic manuals including instructions explaining all operating features, parts lists (part numbers and available vendors), recommended spare parts, lubrication charts and recommended maintenance schedule. Contractor shall also provide one (1) separate copy and two (2) electronic copies of the adjustment, system overview, service tool and troubleshooting manuals.

F. Maintenance Control Program: The Contractor shall provide three (3) separate copies and one (1) CD of the written maintenance control program. One copy shall be stored in the machine room with the maintenance records.

G. Keys: The Contractor shall provide one emergency door key and three (3) sets of properly tagged keys to operate all keyed switches and locks upon completion of the first elevator. Keys shall be delivered to the Owner.

H. Service/Diagnostic Tools:

1. Device: The Contractor shall provide one (1) device (hand-held electronic terminal or lap-top computer with associated software, firmware, cables, associated apparatus and manuals) necessary for adjusting, troubleshooting, testing and servicing the elevator equipment. This device shall be delivered to the Owner upon completion of the first elevator and sha

B. Installer Qualifications: Elevator contractor must be member of Local 2 elevator union in good standing, and has completed several successful elevator installations similar in material, design, and extent as what is being specified for the project.

C. General: Contractor shall include all work necessary to complete the elevator installation per the Contract Documents.

D. Approved Bidders: The Contractors shall be pre-approved by the Owner.

E. Approved Manufacturers: Contractor shall provide material from specified manufacturer. Manufacturers named in these specifications may be found in the latest edition of The Elevator World Source.

F. Other Manufacturers: Contractor may provide material from other manufacturers if approved by the Owner prior to bid.

G. Other Models: Contractor may provide other material from approved manufacturers if approved by the Owner prior to bid.

H. Code Compliance: The elevator equipment shall be designed, fabricated and installed in conformance with ASME A17.1, "Safety Code for Elevators and Escalators," including latest supplement. Contractor shall provide any additional material or modifications to equipment required to meet enforceable Codes, Standards and Laws. Contractor shall make all tests required by the referenced codes and/or inspection authorities. Contractor shall notify inspection authorities with a minimum of 3-days notice and have inspection performed prior to reviews. Inspection delays are not justification for revision of installation schedules without prior written notice.

I. First-Class Condition: Contractor shall include servicing, lubrication and painting of equipment to insure all equipment is in first-class condition at the completion of the project.

J. Multiple Parts: Contractor shall provide the proper number of devices or parts required. In all cases where a device or a part of the equipment is herein referred to in the singular, it is intended to apply to the number of devices or parts required to complete the installation.

K. Accommodation: Contractor shall pay for changes to structural, mechanical, electrical or other systems provided on the drawings required to accommodate contractor's elevator equipment.

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patched to maintain fire rating. Sprayed-on fiber insulation shall not be applied to any surface of the hoistway walls to achieve the required fire rating.

2. Alignment: Hoistway shall be provided which is plumb within 1 inch.
3. Projections: Beveled guards (minimum 75 degrees) shall be provided where the side or rear wall projects, recedes or is set-back more than 4 inches.
4. Patching: Walls shall be patched for drywall-type entrance assemblies to maintain fire rating.
5. Painting: Walls around entrances and fixtures shall be painted. Baked enamel entrance frames and door panels shall be painted.
6. Buffing: Stainless steel entrance frames and door panels shall be cleaned, buffed and shined.

5. Sump Pump: Adequate power shall be provided in the pit area for the sump pump. A single non- GFI-type outlet shall be provided in the pit area. The outlet shall be from a separate branch circuit.
6. Emergency/Standby Power: Adequate power shall be provided to operate one elevator in each group from the emergency/standby generator. Means for absorbing regenerate power shall be retained.
7. Emergency/Standby Power Signals: Two signals shall be provided to each elevator group operational9ETa.59 Va0 16(a1 3)3 25ea1 4 45PT 398(.) 0i001f Twal71.1(t)-1.ev101 Twte pdle--1.1(F)
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5. Hot Work Permit: Contractor shall apply for permit as required by Owner for any work relating to the Fire Alarm System. Contractor shall also coordinate work with the Owner (HVAC shop – 2145 Sheridan – Tech basement).
6.

4. Ascending Car Overspeed Operation: Provide means to detect an overspeed in the up direction and prevent the elevator from striking the overhead structure through an independent emergency braking system.
5. Unintended Car Movement Operation: Provide means to monitor the movement of the elevator and prevent the elevator from moving away from the landing with the elevator hoistway door is not locked and the car door is not closed through an independent emergency braking system.
6. Traction-Loss Detection Operation: Provide means to monitor the loss of traction of the hoist machine and immediately stop the elevator.
7. Programmed Shut-Down Operation: Provide means to stop the elevator at the next un-secure floor, open the doors and remove the elevator from service. The controller shall prevent the operation of the elevator until the problem is manually reset. This operation shall be activated by an encoder over-speed monitor, reduced incoming power monitor, hoist motor over-temperature monitor, the controller over-temperature monitor or the Emergency Phone monitor (which is overridden by Firefighters' Emergency Operation).
8. System Diagnostics: Provide means to identify faults within the control system, including those which do not remove an elevator from service.
9. Firefighters' Emergency Operation: Provide means to operate the elevators during an emergency. Provide connections for smoke detector activation of lobby, alternate floor automatic return and flashing fire indicator.
10. Inspection Operation: Provide means to operate the elevator at reduced speed from the top of the elevator. Activation of Inspection Operation shall remove the elevator from service.
11. Independent Service Operation: Provide means to operate the elevator in response to only car calls. Close doors by holding a car call until doors are completely closedansu2L2.9(y3.1(c

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6. Over-Travel Limiting Operation:

C. Software: Provide non-proprietary type.

D. Service Tool: Provide service tools required for maintenance, testing and troubleshooting.

E. Drive: Provide solid-state IGBT-VVVF with Regeneration control for A.C. hoist motor.

F. Position Sensing: Provide digital solid-state type with maximum 1/4" per pulse. The operational controller shall maintain the position during a power loss. Provide a system that does not utilize a stationary tape in the hoistway. A LED-type position indicator shall be located in the controller.

G. Contactors and Relays: Provide D.C. type which shall be sized to insure proper conductivity and reliable operation.

H. Identifications: Provide permanent non-obstructed markings for all components, including size and type of fuses, identical to those symbols found on the Electrical Wiring Diagrams.

I. Remote Monitoring: Provide terminals for connection to a remote monitoring system. Provide separate output to be connected to the BAS system to signal when the elevator is out of service, including Programmed Shut-Down Operation.

J. Isolation Transformers/Filters: Provide transformers and filters to isolate noise from the electrical system. The wiring shall be copper.

K. Cabinets: Provide NEMA I controller cabinets with hinged doors. Door shall swing as to not block the line of sight with the machine assembly.

L. Labeling: Provide UL, CSA or ASME A.17.5 label for all equipment. The labels shall be easily viewed.

M. Code Data Plate: Provide a data plate that indicates the A17.1 Code to be used for inspections and tests. The data plate shall be of such material and construction that the letters and figures stamped, etched, cast, or otherwise applied to the face shall remain permanently and readily legible. The data plate shall be easily viewed, securely attached in the controller cabinet. The height of the letters and figures shall be not less than 1/8 inch.

N. State Identification Plate: Mount plate on the front of the controller cabinet in the upper right area.

O. Test Data Tag: Provide a tag on the front of the controller with the proper information.

2.4 MACHINE ASSEMBLIES

A. General: Provide material from Hollister-Whitney Elevator Corp.

B. Machine: Provide worm-geared traction type with deflector sheave mounted on an isolated bed-plate. Provide machine beams.

C. Motor: Provide A.C. type directly mounted to the machine with a feedback encoder directly mounted to the motor shaft.

D. Brake: Provide D.C. type with switch to monitor brake operation.

operate at less than 500 rpm. Guide assemblies shall be designed maintain guidance with the loss of rollers. Provide ELSCO guides.

I. Counterweight Frame: Provide steel frame with rods for counterweights. Provide sufficient means to hold counterweights and provide quiet operation.

J. Counterweights: Provide sufficient number and type of weights as required for the motion control system. Weights shall be designed for the counterweight frame and have holes for the Tco-1.1(i)-I2.6(t)nc0783 0 Td (.)Tj .931202 Tc 0

G. Tracks: Provide removable bar or formed steel with contours to match the hangers. Each track shall be reversible.

H. Hangers: Provide a minimum of 3” diameter polyurethane-type with pre-lubricated sealed bearings which will allow vertical and lateral adjustment of the hoistway and car door panels. Each door panel shall have two-point suspension with separate replaceable hangers. Upthrust shall be provided to maintain alignment of the door panels.

I. Gibs: Provide two nylon-type and one metal-type gib per door panel. Fire stops shall be properly bent down on hoistway door panels.

J. Interlocks: Provide an electro-mechanical device which shall prevent the operation of the elevator when the hoistway doors are not closed and locked.

K. Closer: Provide spring, spirator or sash weight type which shall close the hoistway doors from any open position.

L. Door Screen: Provide infra-red pulsed type which shall initiate door reopening operation shall allow reduced speed door closing operation. Provide two-relay type controller which shall allow reduced speed door closing operation. Provide Janus Pana-40 model.

2.9 HOISTWAY ENTRANCE ASSEMBLIES

A. General: Provide material from Hauenstein & Burmeister or Tyler Elevator Products.

B. Entrance Frames: Provide #4 brushed stainless steel bolted type. Provide UL label on hoistway side of entrance frame and transom.

C. Door Panels: Provide #4 stainless steel sandwich type without binder angles. Provide matching or integral sight guards. Provide door panels with rubber astragals to cushion impact. Provide UL label on hoistway side of door panel. Provide 4" high floor marking on hoistway side of one door panel.

D. Sills: Provide extruded aluminum (*or nickel silver*) with grooved surface. Provide support angles which require minimal grouting.

E. Entrance Markings: Provide plates on both sides of the hoistway entrance centered 60" above

B. Shell: Provide reinforced 14-gage steel with black baked enamel finish. Apply sound deadening to exterior.

C. Canopy: Provide reinforced 12-gage steel with white baked enamel finish.

D. Suspended Ceiling: Provide #4 brushed 14-gage stainless steel separated into six (6) sections by etching to match reveals between wall panels.

E. Side and Rear Walls: Provide plastic laminated removable panels. Provide two panels on side walls and three panels on rear wall.

F. Transom: Provide #4 brushed 14-gage stainless steel.

G. Front Return/Entrance Columns: Provide a stationary #4 brushed 14-gage stainless steel return with integral columns.

H. Door Panels: Provide #4 brushed stainless steel sandwich-type without binder angles.

I. Sill: Provide extruded aluminum (*or nickel* silver) with grooved surface.

J. Handrails: Provide one line of #4 brushed 2" by 3/8" stainless steel bars on all three sides with returned ends. Mounting shall be through the car walls from the back and top of handrails shall be 32" above finished floor.

K. Normal Lighting: Provide six (6) LED down lights and LED perimeter light strips in suspended ceiling. The lighting shall be arranged to provide proper and consistent lighting in the elevator cab. Provide two dimmer switches.

L. Emergency Lighting: Provide battery unit with solid-state charger to operate its alarm bell and all the cab normal lighting.

M. Emergency Exit: Provide hinged hatch for evacuation of the elevator through the top of the elevator. Provide a contact to prevent operation of the elevator when the hatch is not closed and wing nuts to lock-down exit.

N. Emergency One-Way Communications: Mount speaker provided by Owner arranged to provide proper sound level in the cab as required.

O. Ventilation: Provide Morrison "OE" multi-speed exhaust blower for proper air flow through elevator cab.

P. Car Top Safety Railing: Provide safety railing, intermediate support and toe guard on top of the elevator on all three sides.

Q. Pads: Provide a complete set of pads with integral hooks.

R. Closed-Circuit TV Camera: Mount CCTV camera provided by Owner as required.

2.11 SIGNAL SYSTEMS

A. General: Provide material from Innovation Industries or Otis Elevator Company.

B. Main Car Station: Provide an applied panel with hinges with the following:

1. Car Position Indicator: Provide 2" high digital red LED segmented type with direction indicators representing the floor served and the direction of travel. Provide MH-110 Model.
2. Pushbuttons: Provide 1-1/8" flush pushbuttons with white LED illumination. Provide vandal-resistant pushbuttons for each floor served which illuminate to indicate call has been registered. Provide emergency control pushbuttons for Alarm, Door Open, Door Close, Door Hold and emergency two-way communication device. A keyed switch shall be provided for Cleaning Service Operation. Provide PTL Centurion model or Otis LuxuryLine model.
3. Pushbutton Markings: All pushbuttons shall be identified by raised numbers/letters/symbols and braille to the left of the pushbutton. Floor pushbuttons shall not have 5/8" high designation in the face of each pushbutton. All other pushbuttons shall have 1/8" high designations in the face of each pushbutton or engraved below each pushbutton for identification. Provide Entrada or SCS die-cast model.
4. Firefighters' Emergency Operation Controls: Provide light jewel and audible solid-state signal.
5. Emergency Communication: Mount integral hands-free telephone unit in car station. The unit shall be line powered. Provide EMS VPP-T 1250 model. Phone shall be properly programmed by Contractor.
6. Engraving: Provide engraving for Elevator Number, Capacity, Emergency Communication Instructions and Door Control Pushbuttons.
7. Location: Pushbuttons shall be located between 35" and 48" above the finished cab floor. Emergency control pushbuttons shall be grouped at the bottom. Firefighters' Emergency Operation controls shall be grouped above the pushbuttons. Emergency communication device and voice module shall be behind a round grille with 1/16" holes above the firefighter's service controls.

C. Firefighters' Cabinet

1. Access: Provide a flush #4 brushed stainless steel door with keyed lock with firefighters' instruction engraved on the inside of the access door. The key shall be FEO K-1.
2. Controls: Provide switches for Phase II and Stop. Provide light jewel and pushbuttons for Door Open, Door Close and Call Cancel. The Phase II keyed switch shall be FEO K-

1. Interactive Management Computer Training Program: Contractor shall provide one 1-hour session of training at the Location. Training shall include complete instruction on the Interactive Management Computer features

B. Contractor shall make a final check of each elevator operation with University's personnel present and just prior to date of Substantial Completion. Determine that control systems and operating devices are functioning properly. Contractor must provide Northwestern a copy of all inspection reports and complete paperwork to provide Northwestern the State Elevator tag before closing the project.

C.

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