

DIVISION 12 CONVEYING EQUIPMENT

Section 14 20 00 – Electric Traction Elevators: Geared

PART 1: GENERAL

1.01 Scope of Standard

- A. This standard provides general guidance concerning the specific preferences of Texas State University for Electric Traction Elevators.
- B. Texas State University recognizes that project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification, it is expected that these guidelines will govern the design and specifications for Texas State University projects.
- C. When geared traction elevators are required the “machine-room-less” type is not acceptable.

1.02 Design Guidelines

- A. Provide at least one passenger elevator for each new and renewed Texas State University building of more than a single story, except as otherwise approved by the Director of Facilities Planning, Design and Construction.
- B. Elevators are required in all multi-story buildings to provide accessibility to the disabled.
 - 1. Passenger Elevator: Minimum capacity is 3500 pounds, 350 FPM.
 - 2. Service Elevator:
 - a. Where service elevators are specifically required, provide elevators with minimum capacity of 5,000 pounds.
 - b. Equip service elevators with horizontal-sliding, center-opening doors.
 - c. Generally, passenger elevators equipped with pads and hooks will adequately serve as service elevators if their load capacity is at least 5,000 pounds.

1.03 Summary

- A. Scope: Provide all required supervision, engineering, labor, materials, and tools necessary to install for geared traction elevators.
- B. Related Sections: The following sections may contain requirements that relate to this section.
 - 1. Section 07 14 00 – Fluid Applied Waterproofing: Waterproofing of elevator pits.
 - 2. Section 26 00 00 – Electrical: Electrical service to main disconnect in elevator machine room, electrical power for elevator installation and testing, electrical disconnecting device to elevator equipment prior to activation of sprinkler system, electrical service for machine room, machine room and pit receptacles with ground-fault current protection, lighting in machine room and pit, wiring for telephone service to machine room.

3. Section 26 32 13 – Standby Power Supply Systems: Emergency generator operation.
4. Section 28 31 00 – Fire Alarm Systems: Fire and smoke detectors and interconnecting devices, fire alarm signal lines to contacts in the machine room.
5. Section 27 35 16 – Telephone Systems: ADAAG – Required emergency communications equipment.

1.04 References

- A. Comply with all applicable current local, state, and federal building codes, elevator codes, laws, regulations, and ordinances at the project site, including but not limited to the following:
 1. ANSI A117.1 - Buildings and Facilities: Providing Accessibility and Usability for Physically Handicapped People.
 2. ADAAG – Americans with Disabilities Act Accessibility Guidelines.
 3. ANSI/NFPA 70 – National Electrical Code.
 4. ANSI/NFPA 80 – Fire Doors and Windows.
 5. ASME/ANSI A17.1 – Safety Code for Elevators and Escalators.
 6. ANSI/UL 10B – Fire Tests of Door Assemblies.
 7. International Building Code.
 8. Model Building Codes.
 9. All other applicable local, state, and federal codes, laws, regulations and ordinances.

1.05 Quality Assurance

- A. Elevator contractor must be able to demonstrate that he has installed and maintained similar elevators to those specified, that he is able to show evidence of satisfactory past performance, that he maintains locally an adequate stock of parts for emergency purposes, that he has under his direct employment and supervision the necessary personnel specifically trained on the type and grade of equipment specified, and that he has been in business for a minimum of five (5) years.
- B. Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of all applicable local, state, and federal codes, laws, regulations, and ordinances.
 1. TDLR Elevator Inspections: While it is the responsibility of the CMAR and their Subcontractor to call for elevator inspection, they should inform the A/E and FPDC of the inspection. FPDC representative should be present during these inspections.
- C. Permits and Inspections: Provide licenses, permits and certificates of inspection for all elevator equipment, as required by local, state, and federal authorities. Perform required inspections and tests. The Owner shall select the QEI Inspector.

1.06 Submittals

- A. Product Data: Submit three copies of manufacturer’s product data for each system to be used.
 - 1. Cab design, dimensions and layout.
 - 2. Fixtures (car stations, hall stations, hall lanterns, position indicators, etc.).
 - 3. Electrical characteristics and requirements. The Elevator Contractor shall provide data concerning the size and location of the mainline switchgear, wiring, fuses and breakers.
 - 4. Heat dissipation of elevator equipment in machine room.
- B. Shop Drawings: Submit three (3) copies of approval layout drawings.
 - 1. Clearances and travel of car.
 - 2. Clear inside hoistway dimensions.
 - 3. Clear inside pit dimensions.
 - 4. Car, guide rails, buffers, and other components in hoistway.
 - 5. Maximum spacing for rail brackets.
 - 6. Maximum loads imposed on guide rails requiring load transfer to building structure.
 - 7. Loads on hoisting beams.
 - 8. Location and sizes of access doors, hoistway entrances, and frames.
 - 9. Interior Cab Design.
 - 10. All Finishes.
- C. Operational and Maintenance Manuals: Provide three (3) copies of manufacturer’s standard operational and maintenance manual for each system to be used.
 - 1. Straight line wiring diagrams of as-installed circuitry.
 - 2. Routine preventative maintenance manuals with operating instructions covering all systems used.
 - 3. Parts catalogs of all components.
- D. Project Schedule
 - 1. Submit schedule of events with Bid Proposal.
 - a. Material ship dates
 - b. Project mobilization date
 - c. Series of events through job completion
 - d. Handover tests and inspections (QEI) date

2. Provide schedule as if one car and then the other will be modernized and a separate schedule if both units are to be modernized at the same time.

1.07 Warranty

Provide warranty to repair or replace parts or components that fail or do not operate properly due to engineering, design, or workmanship for a period of twelve (12) months from the date of final acceptance. The guarantee excludes ordinary wear and tear or improper use, vandalism, or neglect, or any other cause beyond the control of the elevator contractor.

1.08 Maintenance

- A. Provide regular routine preventative maintenance service for a period of twelve (12) months after the date of final acceptance. Maintenance service shall consist of regular examinations of the elevator equipment by technicians specifically trained on the type and grade, and shall include 24-hour callback service. Response time for callback service shall be one (1) hour or less during the normal workday. Response time during after normal work hours shall be one and one half (1 ½) hours or less.

1.09 Addenda

- A. Any and all changes, additions, clarifications, or interpretations will be in writing through Addenda prior to bid opening.

1.10 Acceptable Elevator Companies (Must be listed in alphabetical order):

- A. Otis Elevator Co.
11500 Metric Blvd. Suite 285
Austin, TX 78758
(512) 339-9731
- B. Schindler Elevator Corporation
8868 Research Blvd
Austin, TX 78758
(512) 451-3620
- C. Tejas Elevator Co.
4424-D Brandt Rd.
Austin, TX 78744
(512)454-7878
- D. Thyssen/Krupp Elevator Co.
3615 Willow Springs Rd.
Austin, TX 78704
(512) 447-9511

Part 2: PRODUCTS

2.01 General Characteristics

- A. Passenger Elevators

1. Quantity: Per architectural plans
2. Type: Geared traction
3. Capacity and Speed: 3500# @ 350 FPM
4. Stops: Per architectural plans
5. Openings: Per architectural plans
6. Floors served: Per architectural plans
7. Rise
8. Inside cab height
9. Cab inside, **see EXHIBIT 1**
10. Entrance type and size: One-speed center opening, 42" x 84" minimum.
11. Main Power Supply: 480 volts, +/- 5% of normal, 3 phases, with a separate equipment-grounding conductor.
 - a. If existing Elevators are being remodeled, then field verify existing power voltage.
Lighting Power Supply: 120 volts, 1 phase, 15 amps, 60 Hz.
 - b. If existing Elevators are being remodeled, then field verify existing power voltage.

2.02 Performance

- A. Speed: +/- 2% under any loading condition.
- B. Capacity: Safely lower, stop and hold up to 125% of rated load. Handle full load in both directions.
- C. Leveling accuracy: +/- ¼" under any loading condition.
- D. Door closing time: Thrust and Kinetic energy shall comply with ASME Code and ADA. Closing time shall be adjusted to the minimum allowable.
- E. Door opening time: Doors shall open at 80% of closing time
- F. Ride Quality: Acceleration, run, deceleration, leveling and stopping shall be adjusted for a smooth and comfortable ride.

2.03 Machine Room Equipment

- A. Hoist machines
 1. Hoist machines: Provide Hollister-Whitney geared hoist machines. The motor shall have a slip specification of 5% or less. No substitutions allowed.
 2. Machines shall have isolation pads to prevent the transfer of noise and/or vibration.
- B. Controls

1. Car Controls: Provide MCE 4000 Series controls. No substitutions allowed. Features required are as follows:
 - a. On-board diagnostics
 - b. Out of service timer
 - c. Door operation timers
 - d. Door pre-opening
 - e. Nudging
 - f. Car and hall call registration
 - g. Fire Service Operation
 - h. Independent Service operation
 - i. Two way leveling
 - j. 4000 Series landing system
 - k. Controller test switch
 - l. Relay panel inspection
 - m. Un-cancelled call bypass
 - n. Anti-nuisance
 - o. On-site computer terminal for adjustment and diagnostics
 - p. Emergency power
2. Dispatching System: Provide MCE 4000 Series dispatching system for groups of 3 or more. No substitutions allowed. Features required are as follows:
 - a. Parking Operation
 - b. Lobby Operation
 - c. Time Activated Dispatching Configurations
 - d. Traffic Identification Operation
 - e. Lobby Up Peak
 - f. Demand Up Peak
 - g. Demand Down Peak
 - h. Emergency Dispatch
 - i. Emergency Power

- j. Out-of-Service
 - k. Loaded Car Dispatch
 - l. Display Terminal in Machine Room
 - m. Access Control for Elevators (ACE) Security
3. The controls shall **NOT** have any software embedded which shuts the elevator down when the elevator is operating normally that forces the Owner to contact the manufacturer for service or replacement of major components of the controller.
- C. Speed Governor
- 1. Provide centrifugal-type speed governors. No substitutions allowed.
- D. Provide means for two-way communication between the machine room and each elevator.

2.04 Hoistway Equipment

- A. Hoistway Interlocks
- 1. Provide GAL hoistway interlocks. No substitutions allowed.
- B. Hoistway Doors and Entrances
- 1. Hoistway door size 42" X 84", one-speed center opening.
 - 2. Unlocking devices shall be provided at all landings. Escutcheons shall be stainless steel. Escutcheons shall be mounted with a squeeze type locking collar.
 - 3. All hoistway door panels shall have two gibs per panel.
- C. Car Safeties
- 1. Provide flexible-guide clamp-type safeties. No substitutions allowed.
- D. Car Roller Guides
- 1. Provide adjustable, floating-type roller guide assemblies.
- E. Hoistway Wiring
- 1. All machine room, hoistway, and all other wiring including travel cables shall be new.

2.05 Car Shell

- A. Type: Car shell for all elevators shall be designed and constructed in full compliance with applicable code requirements.
- 1. Floors: $\frac{3}{4}$ " fire retardant plywood subfloor secured to 14 gauge steel plate braced and reinforced to prevent sagging.
 - 2. Walls: Steel braced and reinforced to prevent sagging when leaned against.

3. Ceiling and Car Top: 12 gauge steel, braced and reinforced to support distributed weight of two men.
 4. Finish for All Steel Components: Shop-primed with rust-inhibitive primer complete with finish paint.
- B. Car Shell Size: Shall accommodate clear inside dimensions indicated on drawings.
- C. Car Shell shall be painted black.

2.06 Car Components

- A. Stainless Steel Car Doors and Frames
1. General: Doors and frames shall be designed and fabricated as part of car assemblies for car entrances.
 2. Doors: 42" x 84", 1-3/8" thick, 16 gauge flush steel face sheets, hollow metal construction with reinforcing members spaced 9" apart filled with compressed cork or other sound-absorbing material complying with code requirements.
 3. Door Cladding Material: 16-gauge stainless steel clad to steel face sheets and exposed edges, free of oil-canning and exposed fasteners.
 4. Frame Material: Formed 14-gauge stainless steel with head and jamb in flush alignment corners welded and ground smooth, jamb width as detailed, free of oil-canning. Steel frames with stainless steel cladding are not acceptable.
 5. Finish: "Brushed" #4.
 6. Doors shall be center opening.
 7. Door operator shall be GAL MOVFR operators. No substitutions refer to 2.06/I below for additional door operation.
 8. Door opening protection light rays and safety shoes shall be infrared type. Refer to 2.06/J and 2.06/K below for additional specs.
- B. Car Sides and Rear
1. Apply panels directly to car enclosure using concealed fasteners which allow panels to be removed from car side but which hold panels firmly and in true alignment.
 2. Panels shall be theft-proof by provisions of a tamperproof fastener at top of panel.
 3. HDF for plastic laminate panels shall be fire-retardant.
- C. Fasteners:
1. Exposed fasteners will not be acceptable. Conceal all fasteners at car shell, doorframe and finish panels where exposed to view.
- D. Lighting, Outlets and Emergency Lighting/Alarm Bell:

1. Lighting: Recessed incandescent low voltage downlight lighting fixtures as indicated on drawings.
 2. Power Failure: Electric power failure or other interruption of normal electrical service shall automatically activate emergency lighting and bell function to operate with emergency generator.
 3. Emergency Lighting: Shall be complete with emergency light circuitry, emergency bell, and integral battery powerpack and charger.
 4. In Each Car: Not less than one car light fixture shall be connected to emergency lighting circuit and battery pack.
 5. Battery Pack and Bell: Shall be located on top of car roof in an appropriate location.
 6. Battery Type: 12-volt battery unit including solid state charger and testing means enclosed in common metal container rechargeable lead acid or nickel cadmium battery with 10-year minimum life expectancy.
 7. Electric Power Outlet:
 - a. One 20-amp duplex GFIC 110-volt power receptacle located on each car top enclosure, and inside service cabinet.
- E. Ceiling Exhaust Fans:
1. Type: Concealed and capable of exhausting approximately 500 cubic feet of air per minute at top speed, 300 cfm at slow speed.
 - a. Switch: Dual type located within recessed service panel in car operating front panel.
 2. Vibration Isolation: Exhaust fan shall be installed with adequate vibration isolation material to prevent objectionable noise inside of car when fan is operating at top speed.
 3. In case of power failure, exhaust fan shall be operated by the emergency electrical system immediately and automatically.
- F. Car Finishes: **See EXHIBIT 1**
1. Flooring:
 - a. Fritztile, Classic Flexible Marble Tile, CL 200 Series, 12" x 12" x 1/8" thick, with opaque binding.
 2. Ceiling:
 - a. Ceiling Suspension: As approved by Texas State University.
 - b. Ceiling Panels: Refer to EXHIBIT 1, or if changes as approved by Texas State University.
 - c. Emergency ceiling access panel joints shall be aligned with adjacent joints in ceiling.
 3. Ceiling Lighting:

- a. Type: Refer to EXHIBIT 1: LED downlight fixtures as indicated on drawings, complete with emergency lighting; or if changes as approved by Texas State University.
4. Stainless Steel Doors and Frames:
 - a. Type: AISI Type 302/304.
 - b. Finish: "Brushed" #4.
5. Stainless Steel Return Panels:
 - a. Type: 1/8" thick AISI Type 302/304.
 - b. Finish: "Brushed" #4.
6. Plastic Laminate Wall Panels:
 - a. Type, Plastic Laminate: Refer to EXHIBIT 1: Panels shall be marine-grade (moisture-resistant) plywood core with plastic laminate cladding on face and all edges; or if changes as approved by Texas State University.
7. Wall Base and Wall Panel Reveals: Plastic laminate adhered directly to steel cab walls.
8. Aluminum Sills/Thresholds:
 - a. Type: Extruded, with grooves and concealed fasteners.
 - b. Finish: Mill finish.
9. Car Handrails:
 - a. Type: Refer to EXHIBIT 1: Stainless Steel Bar 1/2" x 2", "Brushed" #4; or if changes as approved by Texas State University.
 - b. Fasteners: Concealed type for all handrails.
- G. Car Operating Front Panels
 1. Type: Integral swing-type assembly manufactured of metal and finish to match entrance columns, complete with the following and as indicated on drawings:
 - a. Hinges: Concealed piano hinges of metal and finish to match panels, of sufficient strength to prevent sagging of panels in open position.
 - b. Locks: Two cam-operated locks concealed behind each operating panel, complete with tamperproof Allen type keyways with smallest possible access port.
 - c. Sound Deadening: Required behind front panels.
 - d. Cutouts: Required for protrusions of car buttons, switches, card readers, etc.
 - e. Self-illuminating floor registration buttons.
 - f. Markings for blind: As indicated on drawings.

- 1). Applied or stick-on markings not acceptable.
- g. Acid Etching: As indicated on drawings. Letter style as specified in this section.
- h. Emergency alarm and door control buttons.
- i. Car Telephone Compartments: Concealed behind door of type complying with applicable code and governing authorities, complete with permanent telephone complying with ADA requirements.
 - 1). Door: Flush, 12 gauge metal of type and finish to match front return panels with hairline joint.
 - 2). Door Hinges: Concealed heavy-duty metal of type to match door finish.
 - 3). Lock: Bullet catch with flush key cylinder.
 - 4). Acid-etch each car number (PE-1 etc.) on panel inside telephone compartments.
 - 5). "Telephone" on door front in raised tactile letters.
 - 6). Contractor shall provide wiring from telephone to Telephone Room.
 - 7). Owner shall provide telephone line connection from Telephone Room to Campus Police Station.
 - 8). Contractor is to provide a Rath Microtech Model 2100-907 RAI phone inside the telephone compartment, so that the phone can be wired for CCTV images.

2.07 Hoistway: Frames/Doors

- A. Door Openings:
 1. 7'-0" high, center opening.
- B. Miscellaneous Items:
 1. Header: 3/16" steel formed to provide stiffening flanges.
 2. Fascia Plates: Concealed type, 14 gauge steel reinforced to ensure a flat even surface, secured to hanger housing and sill.
 3. Sill Support Angles: Required for all entrances.
 4. Struts and Closers: Continuous structural steel angels bolted to sill and building beams above, of size to accommodate door closers.
 5. Cover Plate: 14 gauge steel extended to full travel of door, easily removable from inside of car.
 6. Dustplates: Minimum 14 gauge steel centered on doorway extending 6" both sides of jamb.
 7. Sight Guards for Typical Floors: 16 gauge stainless steel.

8. Toe Guards: 14 gauge steel centered on doorway, extending 6" each side of jamb, with finish paint.
 9. Fascias: 14 gauge steel reinforced to ensure flat even surface, with finish paint.
 10. Cutouts: Required for lights, signals, etc.
 11. Finish for Miscellaneous Steel Items: Rust-inhibitive primer.
- C. Steel Hoistway Doors and Frames
1. General: Doors and frames shall be UL Class "B" Label 1-1/2 hour rated assemblies designed and fabricated as part of door/frame assemblies for hoistway entrances of all elevator hoistways.
 - a. Doors: 42" x 84" 1-3/8" thick, 14 gauge flush steel face sheets, hollow metal construction with reinforcing members spaced 9" apart.
 2. Frames: Formed 14 gauge steel with head and jamb in flush alignment, bolted, secured to sill and header.
 3. Door and Frame Finish: Stainless steel, #4.
- D. Aluminum Sills/Thresholds:
1. Type: Extruded, with grooves and concealed fasteners.
 2. Finish: Mill finished.
- E. Floor Numbers:
1. Type: Tactile and Braille characters, in compliance with ANSI A17.1 and ADA.
 2. Locations: Tactile and Braille on both jambs of all elevator hoistway entrances.
 3. Material for Letters: Brushed stainless steel graphics on black painted plate as indicated on drawings.
 4. Letter Style: Manufacturer's standards.
- F. Door Hangers/Tracks/Supports:
1. Door Hangers: Two-point support hangers designed to take the up thrust of doors equipped with rollers, tracks, hanger, hanger supports and cover plates.
 2. Rollers: Adjustable rubber-tired ball-bearing rollers designed to roll on metal tracks complete with heavy-duty sheaves not less than 3-1/4" diameter.
 3. Tracks: Cold-drawn or cold-rolled polished steel.
 4. Hanger Supports: Formed sections securely bolted to strut angles or closer support angles.
 5. Hanger Cover Plates: Removable type, arranged to assure accessibility from inside of car.
- G. For Emergency Access to Hoistways: Provide unlocking devices at all hoistway doors.

- H. Hoistway Door Interlock:
 - 1. Each elevator hoistway door shall be equipped with an interlock system.
- I. Hoistway Door Operator:
 - 1. Type: GAL MOVFR Heavy-duty, DC master door operator capable of opening doors at not less than 1-1/2 fps and accomplishing reversal in 2-1/2" maximum of door movement.
 - 2. Arrange operator so doors can be opened by hand from inside car in case of power failure, if cars are within leveling zone.
- J. Hoistway Door Re-Opening and Control Device:
 - 1. Door Protective Devices: Infrared electronic detection or proximity devices for protection of passengers.
 - 2. Door Open Timing Feature:
 - a. Shall operate in conjunction with detection to provide adjustable, reduced, hold open time once rays are broken and re-established.
 - b. When rays are broken beyond adjustable time, buzzer sounds and doors shall close at reduced speed, detection device effective to stop but not reverse doors.
 - c. There shall be a difference in door hold-open times between car and hall calls.

2.08 Fixtures (Car stations, Hall Stations, Position Indicators, and Hall Lanterns)

- A. Car stations, position indicators, hall stations, and hall lanterns shall be Innovation Industries "Bruiser" Collection with Stainless Steel #4 brushed finish. No substitutions allowed.
- B. The car station shall be Innovation Industries "Bruiser" Collection with Stainless Steel #4 brushed finish. The COP shall have round push buttons, digital position indicator and emergency light fixture integrated into the panel, built-in push-to-call emergency telephone, keyed stop switch, and a lockable service cabinet.
- C. The in-car lanterns shall be Innovation Industries with Stainless Steel #4 brushed finish.
- D. The hall stations shall be Innovation Industries "Bruiser" Collection with Stainless Steel #4 brushed finish. Hall stations shall be mounted flush with the wall panels. No extended panels allowed.
- E. All lettering (such as Fire Service instructions) shall be engraved and filled. Silk-screened lettering or applied panels with lettering shall not be permitted.

2.09 Graphics

- A. Type: Acid-etched and infilled with paint, and applied tactile graphics as indicated on drawings.
 - 1. Letter Style: Manufacturer's standard.
- B. Braille: Grade 2 Braille.

- C. Tactile Letters:
 - 1. Type: Manufactured of metal and finish to match car operating front panel.
 - 2. Height: Raised a minimum of 1/32”.
 - 3. Letter Style: Manufacturer’s standard.
- D. Applied Sign Plaques: Not acceptable.

2.10 Car Protective Pads

- A. Type: Cotton ticking on one side and reinforced vinyl over 1” thick cotton batting on opposite side, compatible with car enclosure design indicated on drawings.
 - 1. Hooks: Stainless steel type.
 - 2. Quantity: 1 set.

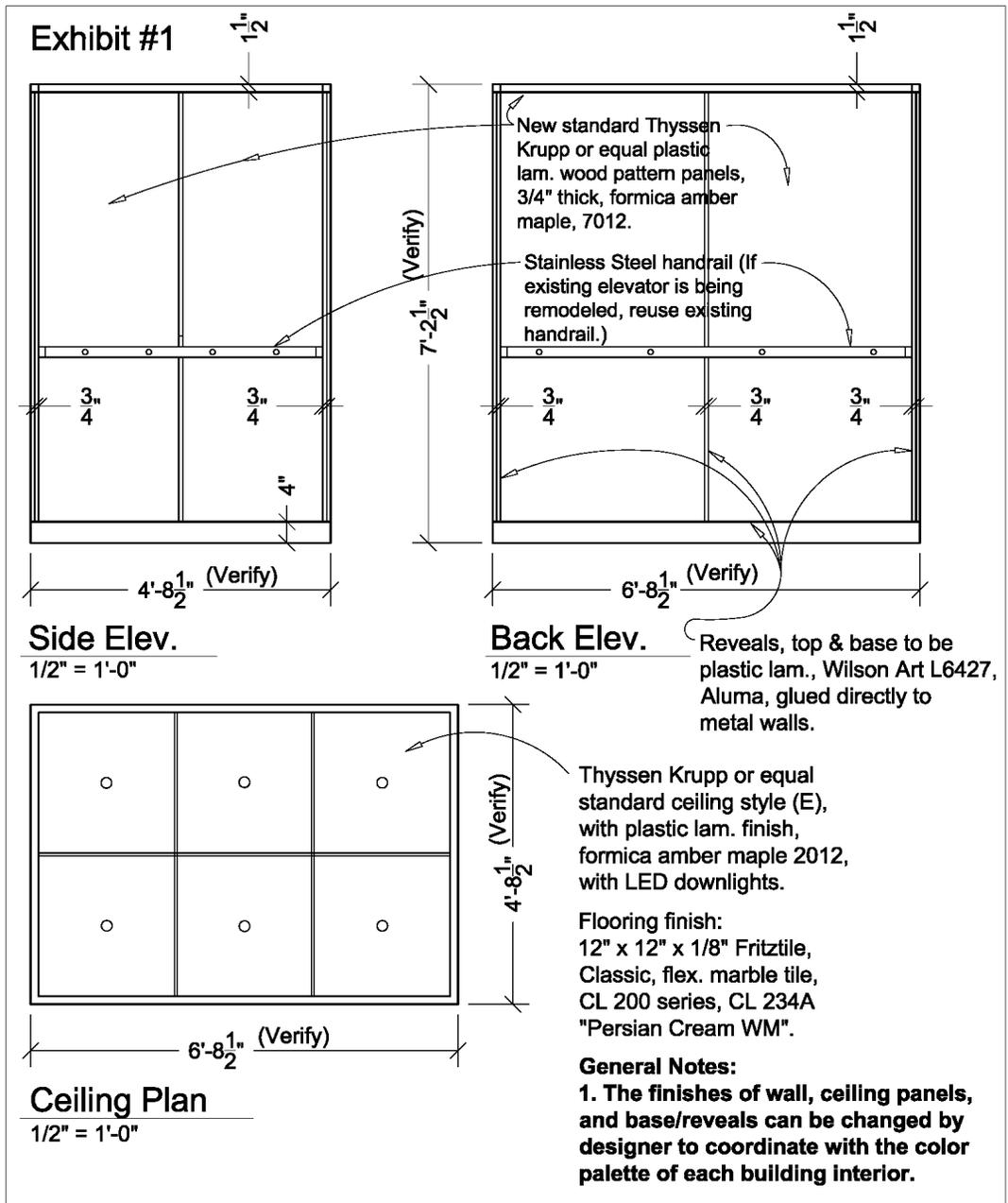
2.11 Architectural Metal Finishes

- A. Brushed Stainless Steel Finish No. 4:
 - 1. Type: General purpose bright mechanically polished “Brushed Finish”, No. 4 obtained by finish with a 120-150 mesh abrasive, following initial grinding with coarser abrasive, complete with protective coating, in accordance with quality standards and methods established by NAAMM to match “control sample” approved by Architect.
 - 2. Protective Coating: Temporary strippable type factory-applied coating for protection of exposed finish.

Part 3: Execution

3.01 Scope

- A. Installation shall meet all standard and generally accepted requirements for elevator construction. All work required for a first-class and complete installation shall be the responsibility of the contractor.
- B. All work shall be expedited. The elevator contractor shall provide OSHA compliant barricades and other protections necessary for public safety. All barricades and other protections shall be removed at the completion of the project.
- C. All equipment shall be finish painted after the installation is complete. The Owner shall select paint colors.
- D. Trash shall be removed daily from all areas.
- E. Final acceptance for all elevator equipment shall have the same date, and will be after all inspections and tests are successfully completed, and the Owners representative is confident that the installation is complete.



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