

ITEM OPPORTUNITY SYNOPSIS

Scouting Number:	2024-145
Name of the item to be scouted:	Elevator
State item to be used in:	Colorado

Describe the Item:

<p>Please describe the item application/the end use of the item.</p>	<p>For the construction of the new Energy and Minerals Research Facility (EMRF) for the U. S. Geological Survey (USGS) at the Colorado School of Mines (Mines), 1000 18th Street, Golden, Colorado 80401, provide three (one service and two passenger) packaged elevators from a single elevator manufacturer and delivered to the EMRF construction site. This project is federally funded by the President Joe Biden's Bipartisan Infrastructure Law (BIL). Therefore, the material used for construction is required to be compliant with the Build America, Buy America Act (BABAA). This NIST MEP Supplier Report seeks three BABAA compliant elevators that meet or exceed the basis of design. The basis of design is three Kone Monospace 500DX Elevators described herein (including additional information). The basis of design for the elevators meets or exceeds the design requirements including the strict technical requirements, maximum size requirements, minimum building/fire/elevator code requirements, maximum delivery schedule, and the maximum cost parameters enclosed. See also the requirements stated in the enclosed specifications, drawings, dimension and performance requirements, and other documents including warranty requirements. The packaged gearless machine room less (MRL) traction elevator systems and associated components and accessories include, but are not limited to, the following: 1. Three elevator cabs (including standard elevator finishes) and hoistway and/or vertical lifting and pit equipment 2. All in cab operating control panels 3. All elevator system operational control panels 4. Cab finishes and lighting 5. Hall stations and lanterns 6. Exterior transom, entrance returns, and elevator doors 7. Two-way communication devices and wiring 8. All equipment, installation, testing, coordination with adjacent construction materials and systems, including, but not limited to, electrical (power and lighting), mechanical (plumbing and HVAC), telephone and data, fire alarm, etc.</p>
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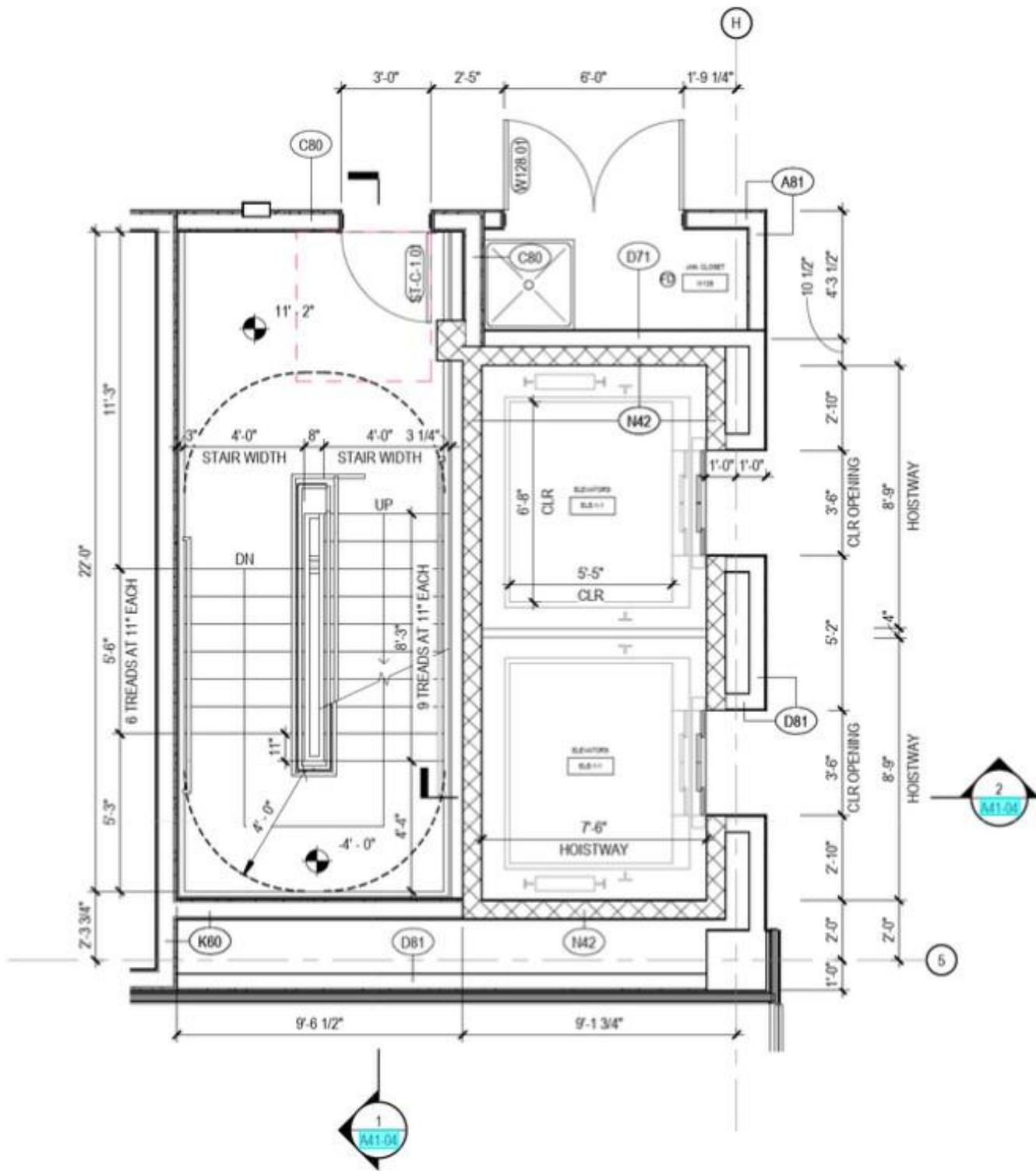
Supplier Information:

Type of Supplier Being Sought (select from the list below):	
Manufacturer	x
Contract Manufacturer	
Distributor	
Other (Please Specify)	
Reason for Scouting Submission (select from the list below)	
2nd Supplier	
Price	
Re-Shore	
Past supplier no longer available	
New Product Startup	
BABA	x
Other (Please Specify)	

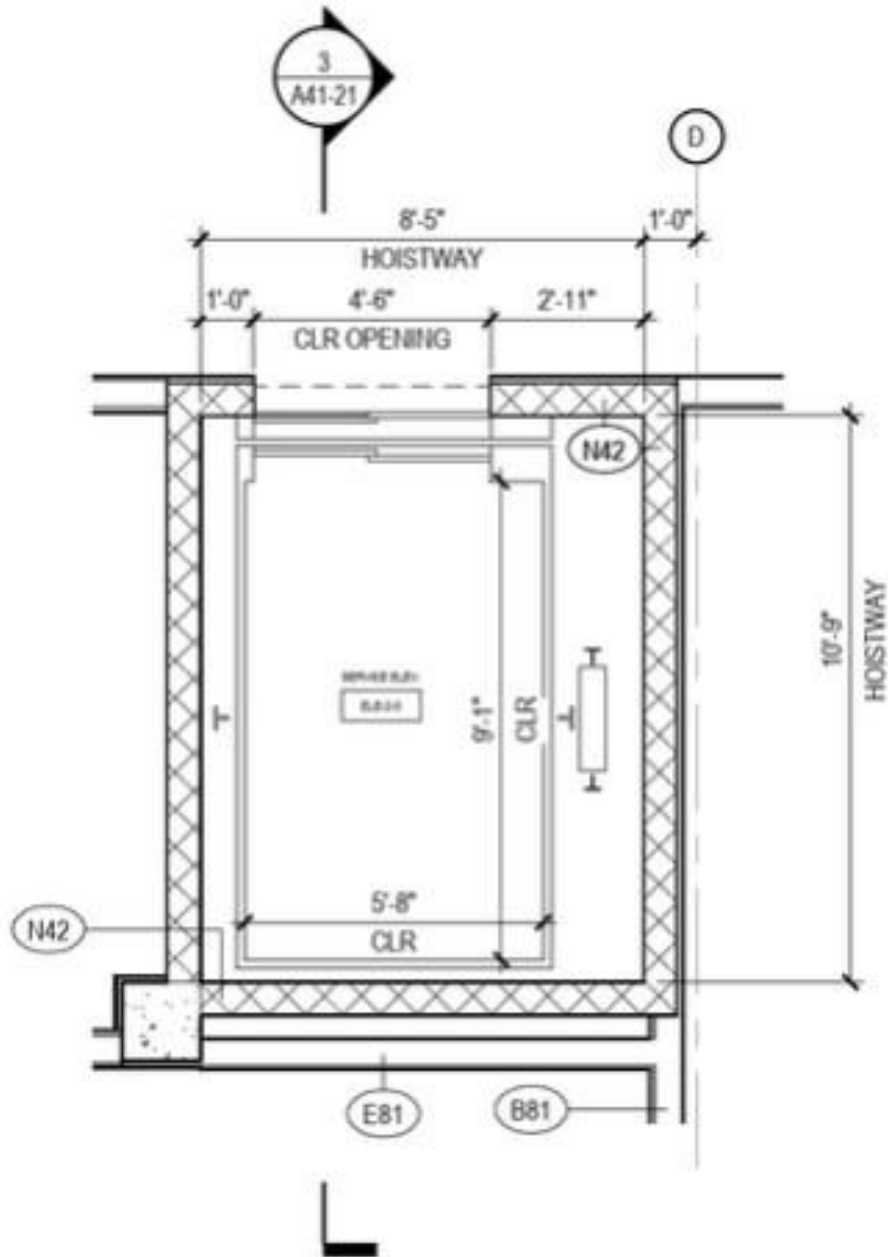
Summary of Technical Specifications and Performance Requirements:

Describe the manufacturing processes (elaborate to provide as much detail as possible)	Electronic and mechanical assembly.
Provide dimensions / size / tolerances / performance specifications of the item	See information provided. The hoistway wall sizes and locations and door openings sizes and locations cannot be altered. The hoistway size is 8'-8"x7'-6" for the two passenger elevators and 8'-0"x10'-9" for the service elevator. Car size of 6'-5.7188"W x 5'-6.6875"D x 8'H for two passenger elevators and 5'-9.5"W x 9'-0.488"D x 10'H for the service elevator. The door dimensions of 3'-6"W x 7'H for the two passenger elevators and 4'-6"W x 9'H for the service elevator.
List required materials needed to make the product, including materials of product components, if applicable	Various, see information provided.
Are there applicable certification requirements?	
Yes	x
No	

Please explain:	See included specification requirements, including but not limited to, American Society of Mechanical Engineers (ASME) standards, International Building Code 2021 (IBC), National Fire Protection Association (NFPA), Accessibility requirements including American National Standard Institute (ANSI A117.1), most current State of Colorado Elevator Code.
Are there any applicable regulations that apply to the production of this item?	
Yes	
No	x
Please explain:	
Are there any other standards / requirements?	
Yes	x
No	
Please explain:	See included specification requirements for elevator minimum functionality, space constraints, load capacity and class, speed, time requirements, number of stops, car ride quality, noise and vibration control requirements, machine type and location, travel distance, cab and door size and location, and finishes.
NAICS CODES:	
NAICS 1	333921 Elevator and moving stairway manufacturing
NAICS 2	
Additional Comments:	
Additional technical comments:	See enclosed specification section and Kone elevator information.
Volume and Pricing:	
Estimated Potential Business Volume (i.e. #units per day, month, year):	Limited to one set of three elevators.
Estimated Target Price/Unit Cost Information:	Total price of \$1,019,000. This price includes (3) KONE Monospace 500DX elevators to be designed, fabricated, shipped, and installed. One year warranty. Price includes elevator cab finishes (minus flooring), traveling cables, signalization, emergency communications equipment with 24/7 support, hoist beams, safety beams, pit ladders, sill angles, entrance header supports, security card readers, and integrated controls. See
Delivery Requirements:	
When is it needed by? (Immediate, 30 days, 6 months, etc.)	Combined lead time for fabrication and delivery is 18 weeks from approved submittal. Required on site delivery and ready for installation date is no later than December 1, 2025, noon local time. This time requirement includes the manufacturer, packaging, and transportation of the elevators. If the delivery schedule is to be on any date prior to listed above, this placement date will need to be coordinated with the general contractor and no delay or storage fees will be allowed.
Describe packaging requirements (i.e. individually/group packaging, etc.)	Crate and package all elevators for secure and undamaged transportation, delivery to, and unloading at the construction site. Unloading of the elevator will be conducted by the general contractor.
Where will this item be shipped?	Shipping will be to Golden, Colorado 80401, at the construction site address listed above.
Additional Comments:	
Is there other information you would like to include?	



Two side by side passenger elevators in one hoistway. See interior car minimum dimensions, maximum hoistway dimensions, and entrance door locations and minimum clearance dimensions.



One service elevator in one hoistway. See interior car minimum dimensions, maximum hoistway dimensions, and entrance door location and minimum clearance dimensions.

SECTION 14 21 50

GEARLESS MACHINE ROOM LESS TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Gearless Machine Room Less (MRL) Traction elevators as follows:
 - 1. Two (2) MRL Passenger Elevators, Cars 1-2.
 - 2. One (1) MRL Service Elevator, Car S1.
- B. Products Installed but Not Furnished Under This Section:
 - 1. Building announcement speakers.
 - 2. Emergency Voice/Alarm Communication System Provisions.
 - 3. Camera provisions.
 - 4. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.
 - 5. Car interior finishes.
 - 6. Car flooring.
 - 7. Internet connectivity hardware.

1.2 SOURCE QUALITY CONTROL

- A. Source Limitations:
 - 1. Obtain vertical equipment, including hydraulic elevators specified in other Division 142000 Sections from single manufacturer.
- B. Buy America Requirements:
 - 1. Applies for any purchase of iron, steel, and other manufactured goods for state and local government projects.
 - 2. Good or product must be produced in the United States.
 - 3. Predominantly steel or iron products:
 - a. Any product that contains 90% or more iron or steel.
 - b. Must contain 95% or more domestic steel or iron.
 - c. Must be 100% manufactured in the United States.

1.3 ACTION SUBMITTALS

- A. All exceptions and/or clarifications to this specification must be reviewed by the consultant.
- B. Product Data:
 - 1. Include capacities, sizes, performance data, operation, control, signal systems operation, safety features, finishes, and similar information.
 - 2. Include product data for car enclosures and hoistway entrances.

3. Include product data for signal fixtures, lights, graphics, Tactile marking plates, and details of mounting.
- C. Shop Drawings:
1. Provide scaled shop drawings of the following:
 - a. Plan and section layouts of hoistways, pits, overheads, machinery spaces and openings at each landing, to include the following:
 - 1) Location of all equipment.
 - 2) Static and dynamic loads imposed on building structure.
 - 3) Details of equipment isolation.
 - 4) Required clearances around equipment.
 - 5) Control room and machine heat release.
 - a) Provide heat loads based on a regenerative emergency power operation.
 - 6) Power requirements:
 - a) motor horsepower, code letter, starting current, full load running current, and demand factor.
 - b) Provide engineered power consumptions based on 120 starts per hour.
 - c) Provide maximum and average power consumption.
 - 7) Service connections.
 - 8) Running Clearances.
 - 9) Location of fixtures.
 - b. Elevation section of hoistways:
 - 1) Overhead, pits: clearances, and runby.
 - 2) Entrance details.
 - 3) Sill support detail.
 - c. Pit Equipment:
 - 1) Buffers.
 - 2) Counterweight guards.
 - 3) Pit reactions.
 - 4) Service ladder, platform.
 - 5) Stop switches.
 - d. Elevator cabs:
 - 1) Car shell fabrication.
 - 2) Gasketing.
 - 3) Ventilation.
 - 4) Ceiling construction details.
 - 5) Wall construction details.
 - 6) Lighting details.
 - 7) Handrail mounting details.
 - 8) Transom, entrance returns.
 - e. Fixtures:
 - 1) Car operating panel.
 - 2) Hall stations.
 - 3) Destination / landing input stations.
 - 4) Hall Lanterns.

- 5) Position indicators.
- 6) Access key switches.
- 7) Remote fixtures.
 - a) Emergency Power selector switches.
- 8) Two-way communication device at all master stations.

D. Submittals:

1. All submittals are delivered via Portable Document Format (.pdf)
2. All submittals are clearly marked and identified with project name and appropriate device identification.
3. All submittals are subject to approval.
4. Corrections requested are incorporated onto the submittals.
5. All shop drawings submitted must be signed and sealed by an Engineer licensed in the state where the elevator system will be installed.

E. Samples for Initial Selection:

1. For finishes involving surface treatment, paint or color selection.

F. Samples for Verification:

1. For exposed car, hoistway door and frame, and signal equipment finishes.
2. Samples of sheet materials: 3" (75 mm) square.
3. Running trim members: 4" (100 mm) lengths.
4. Include full component samples, if requested:
 - a. Signal fixtures
 - b. Lighting
 - c. Graphics
 - d. Tactile markings

1.4 CLOSEOUT SUBMITTALS

A. Continuing Maintenance Proposal:

1. Submit executed Installer's standard five-year maintenance agreement, starting at the end of the warranty maintenance period.
2. State services, obligations, conditions, and terms for agreement period and for future renewal options.

B. Record Documents:

1. The following record documents are furnished upon completion and before final payment and delivered via Portable Document Format (.pdf):
 - a. Shop Drawings:
 - 1) Complete sets of as installed plan and section layouts of hoistways, pits, overheads, and equipment spaces, to include the following:
 - a) Static and dynamic loads imposed on building structure.
 - b) Details of equipment isolation.
 - c) Required clearances around equipment.
 - d) Control room heat release.
 - e) Power requirements.
 - 2) Elevation section of hoistways:
 - a) Overhead, pits and entrance details.

- 3) Elevator cabs.
 - 4) Fixtures:
 - a) Car fixtures.
 - b) Hall fixtures.
 - c) Remote fixtures.
 - 5) Control room heat release and power requirements.
 - b. Wiring Diagrams:
 - 1) Complete sets of as installed straight-line wiring diagrams, showing the electrical connections of all altered vertical transportation equipment, are furnished upon completion.
 - 2) A legend sheet is furnished with each set of drawings containing the following information:
 - a) Name and symbol of each relay, switch and other electrical or solid-state apparatus.
 - b) Location on drawings, drawing sheets, number and area of switches and relays, and location of all contacts.
 - c) Location of apparatus whether on controller, in hoistway or on elevator cab.
 - c. Maintenance and Operating Manuals:
 - 1) Description and sequence of operation of all equipment installed, including operating use for Building Personnel and tenants, as well as system troubleshooting manuals for technicians.
 - 2) Maintenance instructions and procedures of all vertical transportation equipment installed, including parts lists, for each elevator system.
 - 3) Lubrication charts indicating all lubricating points and type of lubricant recommended for all equipment.
 - 4) Complete parts catalogs for all replaceable parts.
- C. Tools:
1. The following equipment is furnished upon completion and before final payment:
 - a. The Elevator Contractor provides all the necessary tools, including laptop, hand-held devices, required software and manuals, required to troubleshoot, adjust, synchronize, calibrate, repair, and maintain the vertical transportation systems, as well as perform all necessary procedures to perform all safety tests as required by code and local governing authority.
 - b. Owner's equipment and software is updated regularly to properly troubleshoot, adjust, synchronize, calibrate, repair, maintain and test the vertical transportation systems. All equipment and/or software is of the same version as issued to technicians maintaining the vertical transportation systems.
 - c. The Elevator Contractor provides a backup copy of any software that resides on the troubleshooting tool.
- D. Keys:

1. Four sets of keys to operate all keyed switches and locks are furnished upon completion.
2. Keys properly tagged.
3. All keying arranged with the Contractor.

1.5 PERMITS, TESTS & CERTIFICATES

A. Permits:

1. The Elevator Contractor secures the permits required for work to be performed, including work of sub-contractors.
2. The Elevator Contractor obtains and pays for all municipal and state permits necessary for execution of the elevator work, including fees for renewing permits.
3. The Elevator Contractor is responsible for posting all permits as required by the AHJ.
4. The Elevator Contractor is responsible for obtaining final sign-off and approval for each permit.

B. Tests and Inspections:

1. The Elevator Contractor performs all necessary tests as required by ASME A17.1 and recommended by A17.2.
2. The Elevator Contractor is responsible for scheduling the necessary tests as required by the local authorities.
 - a. Any fees associated with a missed appointment, or for expediting of test or overtime tests due to delays caused by the Elevator Contractor are the responsibility of the Elevator Contractor.

C. Certificates:

1. Elevator Contractor is responsible for obtaining and providing Contractor with all temporary and final inspection certificates of the proper governing authorities and provides the Contractor with such certificates.
2. The Elevator Contractor pays for all fees necessary for obtaining temporary and final inspection certificates.

1.6 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies:

1. Comply with most stringent provisions of codes, laws, and/or authorities, including revisions and changes in effect.

B. Progress Reviews:

1. The Elevator Contractor is subject to reviews by the Consultant and/or Contractor at any time throughout the project.
2. Contractor to assist without additional cost.

1.7 DELIVERY, STORAGE, AND HOISTING

A. General:

1. The protection of all equipment and exposed finishes is the responsibility of the Elevator Contractor during delivery, handling, and installation until final acceptance of elevator equipment.
 2. The Elevator Contractor replaces damaged materials with new, at no additional cost for material and labor.
- B. Delivery and Storage:
1. It is the responsibility of the Elevator Contractor to properly store and protect all materials in space provided or designated by the Contractor against damage, stains, scratches, corrosion, weather, construction debris and environmental conditions.
 2. Deliver materials to the site in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
 3. Store materials under cover in a dry and clean location, off the ground. Remove delivered materials that are damaged or not suitable for installation from the job site and replace with acceptable materials.
- C. Hoisting:
1. All required hoisting and movement of equipment is the responsibility of the Elevator Contractor.

1.8 COORDINATION

- A. General:
1. Coordinate the following requirements with the other trades.
- B. Cast-in-Place Concrete:
1. Elevator Contractor to provide guide rail bracket inserts and the locations for the General Contractor to install.
 2. Provide other hoistway and pit requirements, including location of sump pits.
- C. Masonry Penetrations:
1. Provide locations in elevator control room/hoistway walls where conduit, ropes, and wiring penetrate walls and slabs.
 2. Coordinate installation of sleeves, block outs, inserts, and items that are embedded in concrete or masonry for elevator equipment.
 3. Furnish inserts, templates and installation instructions and deliver to Project site in time for installation.
- D. Structural Steel:
1. Including, but not limited to, elevator control rooms, hoistways and pits, sill supports, rail supports.
- E. Miscellaneous Steel:
1. Pit ladders, pit divider screens, working platforms, inspection platforms, guard rails, divider beams.
- F. Electric:
1. Electrical service, mainline disconnects, 110 VAC disconnects, outlets, lights, switches in elevator control rooms and pits.

- G. Sprinklers:
 - 1. Including installation of sprinkler systems in the elevator pits or shaft as per NFPA 13.
- H. HVAC:
 - 1. Provide necessary information to General Contractor and coordinate installation of equipment for elevator control rooms.
- I. Finishes:
 - 1. Cab interiors, hoistway entrances, fixtures.
- J. Elevator Cab Flooring:
 - 1. Material and finish as specified.
 - 2. Flooring installation must be coordinated to ensure car sill is installed level with finished floor.
- K. Security Equipment:
 - 1. Coordinate locations in elevator control rooms and cabs where cables, conduit, and other components for CCTV and/or security equipment must be installed.

1.9 WARRANTY

- A. Manufacturer's Warranty:
 - 1. Manufacturer agrees to repair, restore, or replace elevator equipment that fails due to defective materials or poor workmanship within specified warranty period.
- B. Warranty Period: Twelve (12) months from date of Substantial Completion:
 - 1. The Elevator Contractor guarantees that the materials and workmanship of the apparatus installed by them and any subcontractor, under this contract, is first class in every respect and that they will make good on any defects not due to ordinary wear and tear or improper use, which may develop within one year from the date of final acceptance of all equipment.
 - 2. Manufacturer's warranty to repair or replace defective products or their components in the event of defects within a specified period.
 - 3. Neither the final payment nor any provisions of the contract documents relieve the Elevator Contractor of any obligation provided by law. They shall remedy any defects and pay all expenses for any damage to other work.
 - 4. The warranty as outlined above, for all devices, starts from the date of final acceptance of each device, by the Consultant and the Owner, of all work specified and intended under these contract documents.

1.10 MAINTENANCE

- A. General:
 - 1. All maintenance is performed according to the guidelines stated in manufacturer's Maintenance and Operations manuals.
 - 2. Maintenance records for each device, including lubrication logs, check charts, are provided in each control room.
 - 3.

- B. Construction Maintenance:
1. Upon substantial completion of a device, after receiving sign-off from the governing authorities and acceptance from Consultant and/or Contractor, the device may be accepted for service before completion of the entire project.
 2. During the Construction Maintenance period, the necessary preventive maintenance is performed on a scheduled basis.
 3. Provide the necessary protection of the hoistway entrances and sills, hoistway fixtures, cab interiors and fixtures and car door sills.
 4. Replacement or repair of components, due to misuse by others, is the responsibility of the Contractor/Owner.
 5. Perform emergency callback service during normal working hours
 6. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of sixty minutes or less.
- C. Warranty Maintenance:
1. Upon final acceptance of each device, subsequent to receiving acceptance and sign-off from the governing authorities and final acceptance, each device is accepted for full operation.
 2. The warranty maintenance period begins for each device when all conditions in the above paragraph are met and will continue for a specified period.
 - a. Warranty Maintenance Period may begin at different times for each elevator.
 3. The warranty maintenance program includes the following:
 - a. Monthly examinations, including adjustments, cleaning, and lubrication of equipment.
 - b. 24-hour Emergency Call back service is provided at no additional cost to Owner.
 - c. Replacement of components as required, using only components produced by the original manufacturer.
 - 1) Each control room is equipped with a lockable storage cabinet to contain the necessary spare parts.

PART 2 - PRODUCTS

2.1 REFERENCES

- A. Definitions:
1. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.
- B. American Society of Mechanical Engineers:
1. ASME A17.1 - Safety Code for Elevators and Escalators.
 2. ASME A17.2 – Guide for Inspection of Elevators, Escalators, and Moving Walks.
 3. ASME A17.5 – Elevator and Escalator Electrical Equipment.
 4. ASME A17.6 – Standard for Elevator Suspension, Compensation, and Governor Systems.
- C. International Building Code (IBC)

- D. National Fire Protection Association (NFPA):
 - 1. NFPA 13 – Installation of Sprinkler Systems.
 - 2. NFPA 70 – National Electric Code.
 - 3. NFPA 80 – Fire Doors and Windows.
 - 4. NFPA 101 – Life Safety Code.
- E. Accessibility:
 - 1. American National Standard Institute (ANSI):
 - a. A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ADAAG – Americans with Disabilities Act Accessibility Guidelines.
 - 3. Uniform Federal Accessibility Standards (UFAS).

2.2 MANUFACTURERS

- A. Subject to compliance with project requirements, provide products by one of the following:
 - 1. MRL Systems:
 - a. KONE Incorporated: MonoSpace 500, Monospace 700.
 - b. Otis Elevator Company: Gen 3 Edge, Gen 3 Peak.
 - c. Schindler Elevator Corporation: 5500, 3300XL.
 - d. TK Elevator: EVO 200, Synergy.
 - e. Manufacturer’s standard components, including machines, controllers, door equipment, fixtures, and cab enclosures, are approved.
 - 2. Two-Way Communication Device:
 - a. RingComm.
 - b. EMS.
 - c. TOA.
 - d. Kings III.

2.3 PERFORMANCE REQUIREMENTS

- A. Car Speed:
 - 1. $\pm 3\%$ of contract speed under any loading condition.
- B. Car Capacity:
 - 1. Safely lower, stop and hold 125% of rated load.
- C. Car Stopping Zone:
 - 1. $\pm 1/4$ " under any loading condition.
- D. Door Times:
 - 1. Seconds from start to fully open or fully closed:
 - a. Cars 1-2: Door open 1.7 seconds, door close 2.4 seconds.
 - b. Car S1: Door open 3.0 seconds, door close 6.1 seconds.
- E. Car Floor-to-Floor Performance Time:
 - 1. Seconds from start of doors closing until doors are 3/4 open for center opening doors and car level and stopped at next successive floor under any loading condition or travel direction:
 - a. Cars 1-2: 9.0 seconds, floor height 11’-2”, between floors 4 and 5.

b. Car S1: 14.4 seconds, floor height 11'-2", between floors 4 and 5.

F. Car Ride Quality:

1. Acceleration and Deceleration:
 - a. Smooth, constant, and not less than 2.5 feet/second² with an initial ramp between 0.5 and 0.75 second.
2. Sustained Jerk:
 - a. Not more than 6 feet/second³ or twice the rate of acceleration.
3. Horizontal and vertical acceleration within car during all riding and door operating conditions.
 - a. Not more than 15 mg peak to peak (adjacent peaks).
4. Measurement Standards:
 - a. Measure and evaluate ride quality consistent with ISO 18738, using low pass cutoff frequency of 10 Hz and A95 peak-to-peak average calculations.

G. Noise and Vibration Control:

1. Airborne Noise:
 - a. Measured noise level of elevator equipment and its operation does not exceed 55 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
 - b. Limit noise level in the control room relating to elevator equipment and its operation to no more than 80 dBA.
 - c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the "A" weighted scale.
2. Vibration Control:
 - a. All elevator equipment is mechanically isolated from the building structure and other components to minimize noise and vibrations being transmitted to occupied areas of the building.

2.4 ELEVATORS

A. Passenger Elevators Description:

1. Elevator Identification: Cars 1-2.
2. Capacity: 3,500 lb.
3. Class of Loading: Class A.
4. Contract Speed: 350 fpm.
5. Roping: 2:1
6. Machine: Gearless.
7. Machine Location: Overhead in Hoistway.
8. Controller Location: In control room provided at Basement Level. Jamb/hoistway mounted controllers are not approved.
9. Control System: Supervisory Control, Collective microprocessor-based: Duplex selective collective control.
10. Floors Served, Front: B, 1-5.
11. Openings: Front 6.
12. Minimum Clear Height to underside of canopy: 8'-0" High.
13. Entrance Size: 3'-6" Wide X 7'-0" High.

14. Entrance Type: Single-speed, side-opening.

B. Service Elevator Description:

1. Elevator Identification: Car S1.
2. Capacity: 5,000 lb. AIA
3. Class of Loading: Class A.
4. Contract Speed: 200 fpm.
5. Roping: 2:1
6. Machine: Gearless.
7. Machine Location: Overhead in Hoistway.
8. Controller Location: In control room provided. Jamb/hoistway mounted controllers are not approved.
9. Control System: Operational Control, Collective microprocessor-based: Simplex selective collective control.
10. Floors Served, Front: B, 1, 3, 5, 6.
11. Openings: Front 5.
12. Minimum Clear Height to underside of canopy: 10'-0" High.
13. Entrance Size: 4'-6" Wide X 9'-0" High.
14. Entrance Type: Two-speed, side-opening.

2.5 MATERIALS

A. Steel:

1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
3. Structural Steel Shapes and Plates: ASTM A36.

B. Stainless-steel:

1. Type 302, 304, or 316 and 400 series complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability.
2. 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.
 - a. No. 4 Satin:
 - 1) Directional polish finish.
 - 2) Graining directions as shown or, if not shown, in vertical dimension.
 - b. Textured:
 - 1) .050 inches mean pattern depth with bright directional polish (No. 4 satin finish).
 - 2) 5WL as manufactured by Rigidized Metals.
 - 3) 5-SM as manufactured by Rimex Metals.
3. Extruded stainless-steel:
 - a. 304 stainless-steel per ASTM A276.
 - b. Hot finished and stretched straightened.
 - c. Polished finish.

C. Aluminum:

1. Extrusions per ASTM B221; sheet and plate per ASTM B209.
 2. Die Cast Aluminum – ASTM B108, Alloy 356.0, T6.
 3. Extruded Aluminum – FS QQ-A 200/8, Alloy 6061, T6.
- D. Nickel-Silver:
1. Extruded nickel-silver:
 - a. C77600 nickel-silver
 - b. Hot extruded, temper code M30
- E. Plastic Laminate:
1. ASTM E84 Class A and NEMA LD3.1, Fire-Rated Grade (GP-50), Type 7, 0.050" ±.005" thick.
 2. Exposed Surfaces: Color and texture selected by Architect.
 3. Concealed Surfaces: Manufacturer's standard color and finish.
- F. Fire-Retardant Treated Particle Board Panels:
1. Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing.
 2. Meet ASTM E84 with a flame-spread rating of 75 or less, and smoke development rating of 450 or less.
- G. Natural Finish Wood Veneer:
1. Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade.
 2. Place veneer, tapeless spliced with grain running in direction shown, belt, and polish sanded, book matched.
 3. Meet ASTM E84 with a flame-spread rating of 75 or less, and smoke development rating of 450 or less.
- H. Paint Finishes:
1. General:
 - a. 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.
 - b. Galvanized metal need not be painted.
 2. Prime Finish:
 - a. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces.
 - b. Sand smooth and apply final coat of primer.
 3. All equipment and metal work installed under this contract, which does not have a baked enamel or special architectural finish, and which is exposed in the hoistway, is cleaned, and painted one field coat of enamel.
 4. All control room equipment is painted upon completion of the installation with the manufacturer's standard machinery enamel.
 5. Elevator designation (number and/or letter) is prominently indicated on all control room and machinery space equipment, top of car crosshead and pit equipment.
- I. Baked Enamel Finish:

1. Prime finish per above.
2. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

J. Glass:

1. Laminated safety glass, minimum 9/16" thick.

2.6 OPERATION

A. General:

1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3. Automatic Dispatch Failure: Provide auxiliary dispatch system to automatically dispatch elevators in the event of failure of the primary control system.
4. Hall Call Button Failure: Should failure of hall call button system occur, initiate operation providing predetermined service to all landings; elevators respond normally to car calls.
5. Automatic Leveling:
 - a. When arriving at a floor cars level to within 1/8" above or below the landing sill prior to opening doors, without travelling past the landing during leveling
 - b. Maintain leveling accuracy regardless of carload, direction of travel, rope slippage or stretch.
6. Power Conservation:
 - a. Shut off car interior illumination and ventilation after adjustable period (60-180 seconds) of no elevator demand.
 - b. turn on prior to opening car doors when elevator demand returns.

B. Door Operation:

1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of "door open" button.
3. At expiration of normal dwell time, or upon activation of "door close" button, close doors:
 - a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
 - b. In event of door reopening device failure, provide for automatic shutdown of car at floor level with doors open.
 - c. Close cycle does not begin upon activation of "door close" button until normal door dwell time for a car or hall call has expired, except firefighters' operation.
4. Nudging Operation:
 - a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.

- b. Activation of the door open button overrides nudging operation and reopens doors.
 - 5. Interrupted Beam Time:
 - a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
 - b. 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.
 - 6. Differential Door Time:
 - a. Field adjustable time that doors remain open after stopping in response to calls.
 - b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
 - c. Hall Call:
 - 1) Hold open time adjustable between 5.0 and 8.0 seconds.
 - 2) Use hall call time when car responds to coincidental calls.
- C. Independent Service:
 - 1. When feature is activated from within the car, allow control of car from buttons and controls inside the car.
 - 2. Close doors by constant pressure on desired destination floor button or door close button.
 - 3. Open doors automatically upon arrival at selected floor.
- D. Load Weighing:
 - 1. Provide cars with adjustable load weighing device which monitors cable tension.
 - 2. Control system to provide dispatching at main floor in advance of normal intervals when car fills to a field adjustable, 10%-100%, percentage of rated capacity.
 - 3. Provide hall call by-pass when car is filled to a field adjustable, 10%-100%, percentage of rated capacity.
 - 4. Audible overload signaling device inside elevator cab shall be activated upon load weighing device sensing carload has reached or exceeded a pre-determined percentage of capacity.
 - 5. Doors will no close when overload signaling device is active.
- E. Simplex selective Collective Operation, Car S1:
 - 1. Elevators operate via momentary pressure buttons to:
 - a. Place hall call by selecting direction of travel at each hall landing (up and down buttons at each intermediate landing, single buttons at each terminal landing).
 - b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
 - 2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
 - 3. Stops are made in order in which landings are reached, irrespective of sequence in which calls are registered.
 - 4. Parked Car (No Demand):

- a. When feature is enabled, elevator remains at landing of last assignment (if no further demand) with doors closed, for a predetermined amount of time (programmable for any amount of time). Upon expiration of time, the elevator returns to the main egress landing with the doors closed.
 - b. If feature is disabled, if no further demand, the elevator remains at landing of last assignment with the doors closed until a hall call is registered.
 5. Car and Hall Lanterns:
 - c. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.
 - d. Visual signal remains active from commencement of door opening until doors are completely closed.
- F. Duplex Selective Collective Operation, Cars 1-2:
 1. Elevators operate via momentary pressure buttons to:
 - a. place hall call by selecting direction of travel at each hall landing (up and down buttons at each intermediate landing, single buttons at each terminal landing).
 - b. place car call by selecting destination floor from inside the car (individual buttons for each floor served).
 2. Hall calls, other than calls placed at the landing at which car is standing, start car and cause the car to stop at first landing for which a call is registered in the direction of travel.
 3. Car calls cause the car to stop at the floors registered in the order the car arrives at each selected floor in its current direction of travel.
 4. Free Car:
 - a. When there are no calls in the system, one car is automatically dispatched to the elevator discharge level (home car), park other car (free car) at its last stop above elevator discharge level.
 - b. An idle free car answers call above or below it, except calls at main or Basement landings (where applicable).
 - c. When free car travels to main landing in response to a car call, it becomes home car and former home car travels to a middle floor above main landing and becomes the free car.
 - d. When free car is responding to calls, home car shall respond to the following:
 - 1) Up calls below UP traveling free car.
 - 2) All Up and Down calls behind DOWN traveling free car.
 - 3) Any hall calls registered when free car is delayed in its normal operation for a predetermined period.
 - e. When both cars are responding to registered car and hall calls, the first car to complete its calls becomes the assigned home car and is dispatched automatically to the Main Landing.
 - f. Only one car responds to each hall call.
 5. If either car is removed from service, the other car responds to all registered hall calls and its own car calls.
 6. Car and Hall Lanterns:

- a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.
 - b. Visual signal remains active from commencement of door opening until doors are completely closed.
- G. Standby or Emergency Power Operation:
 1. The terms Standby Power and Emergency Power are both referred to as Emergency Power in this Section. Elevator operation is the same when either is provided.
 2. Where emergency power is provided to the elevator main disconnects and required by the Building Code the elevator installation shall comply with the Emergency Power Operation requirements of ASME A17.1 as modified by any superseding Building Code requirements.
 3. Where emergency power is not provided, all elevator controller software and sequencing capabilities to allow future emergency power operation shall be included in the elevator control systems based on the applicable code requirements for new buildings in effect at the time of project permit application.
 4. Operation is activated by a signal from an Automatic Transfer Switch (ATS) to elevator controls indicating the Emergency power source is operational.
 - a. Start and run one car in each group and each single car simultaneously at contract car speed and capacity.
 - b. Illuminate "ELEVATOR EMERGENCY POWER" signals.
 5. Automatic Selection and Return to Designated Landing: Provide automatic selection and return to designated landing for all elevator banks and single elevators in the building.
 6. Restoration of Normal Power:
 - a. At least 20 seconds prior to transfer from emergency power to normal power at the ATS, a pre-transfer signal is supplied to the elevator control system from the ATS.
 - b. Elevators operating on emergency power stop at the next available landing and remain there until normal power is restored.
- H. Firefighters' Emergency Operation:
 1. Provide equipment and operation in accordance with code requirements.
- I. Motion Control:
 1. 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.
 2. Limit the difference in car speed between full load and no load to not more than $\pm 3\%$ of the contract speed.
- J. Emergency Lighting, Communication, and Alarm:
 1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and communication system.
 2. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum

- of 1 hour of operation for car-mounted alarm and any remote alarm mounted at the designated level.
 - 3. Battery to be rechargeable with minimum five-year life expectancy.
 - 4. Provide constant pressure light test button in service compartment of car operating panel.
 - 5. Provide lighting integral with normal car lighting system.
- K. Emergency Battery Operation, if Standby Power is not provided:
- 1. Upon loss of normal power automatically move the car to the nearest landing depending on the load in the car.
 - 2. Upon arrival at the landing, the elevator doors open automatically, and the elevator is removed from service.
 - 3. Upon restoration of normal power, the elevator shall automatically resume normal operation.
 - 4. The auxiliary power source is provided via 12-volt D.C. battery units installed in control room.
 - 5. Include solid-state charger and testing means mounted in a common metal container.
 - 6. Battery to be rechargeable lead acid or nickel cadmium with a five-year life expectancy.
- L. Card/Proximity Reader Security System:
- 1. Provide provisions inside all cars for reader unit.
 - 2. Mount reader unit as directed by Architect. Connect to card reader via traveling cable to terminal interface and relays in control room.
 - 3. Provide filler plate panel to match card slot size or proximity reader size and car return panel finish, including direction of graining.
 - 4. Provide output signal to facilitate system tracking of floor access.
- 2.7 EQUIPMENT SPACE EQUIPMENT
- A. Arrange equipment in spaces shown on drawings.
- B. Solid State Power Conversion and Regulation Unit:
- 1. Provide solid-state, alternating current, variable voltage, variable frequency (ACV³F), IGBT converter/inverter regenerative Power Factor¹ drive.
 - 2. Design unit to limit current, suppress noise, and prevent transient voltage spikes into building power supply.
 - a. Provide internal heat sink cooling fans for the power drive portion of the converter panels.
 - b. Mechanically isolate unit to minimize noise and vibration transmission.
 - 3. Conform to IEEE standard 519-2014 for line harmonics and switching noise.
 - 4. Provide isolation transformers, filter networks, and choke inductors.
 - 5. Suppress solid-state converter noises, radio frequency interference, and eliminate regenerative transients induced into the mainline feeders or the building standby power generator.
 - 6. Supplemental direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, from separate static power supply.

7. ACV³F Drives are regenerative and utilize IGBT converter/inverter and dynamic braking during overhauling condition.
- C. Resistor Load Bank:
 1. Provide means of diverting regenerated power during emergency power operation and restoring regenerated power delivery back to the electrical distribution system following emergency power operation termination.
 2. Provide resistor load bank to discharge regenerative power during emergency power operation.
 3. Load bank is installed on the load side of the mainline disconnect.
- D. Encoder:
 1. Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.
- E. Controller:
 1. Install equipment in the Control Rooms provided. Jamb mounted controllers are not acceptable.
 2. UL/CSA labeled.
 3. Compartment:
 - a. Securely mount all assemblies, power supplies, chassis switches, relays, on a substantial, self-supporting steel frame.
 - b. Completely enclose equipment with covers.
 - c. Provide means to prevent overheating.
 4. Relay Design:
 - a. Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear.
 - b. Provide wiping action and means to prevent sticking due to fusion.
 - c. Contacts carrying high inductive currents are provided with arc deflectors or suppressors.
 5. Microprocessor Hardware:
 - a. Provide built-in noise suppression devices that 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 are not affected by accidental grounding of any part of the system.
 - f. System automatically restarts when power is restored.
 - g. System memory is retained in the event of power failure or disturbance.
 - h. Equipment is provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
 6. Wiring:
 - a. CSA labeled copper for factory wiring.
 - b. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.

- c. Provide labels for all extra or spare wires, neatly organized at base of controller cabinet.
- 7. Data Monitoring:
 - a. Provide an onboard monitor or screen, either inside the controller or in a stand-alone PC station, to display an easily understood format.
 - b. Upon command, the current operating parameters, individual car status, floor positions or other selected operational features will be displayed.
 - c. Display a minimum of 20 previous errors, which will be logged for statistical evaluation.
 - d. Provide means for hard copy printouts.
 - e. Diagnostic display will support monitoring of elevator motion, velocity, door operation parameters and timing functions.
 - f. Non-volatile memory is required to store group operation data with provisions for data logging and hard copy reporting.
 - g. Network connectivity provision is incorporated in the basic dispatching control system.
 - 1) This provision may be employed for traffic analysis, hard copy computation and/or remote monitoring of status conditions utilizing an isolated PC and compatible printer for reports or graphs.
 - 2) All reports are time and date stamped to confirm reporting period.
 - h. Monitor employs color video displays for the following information:
 - 1) Display screen (group operations statistics).
 - 2) Monitoring screen (diagnostics, system status).
 - 3) Performance screen (traffic analysis).
 - i. Features required regarding remote and additional location monitoring, as indicated in other applicable sections, apply.
- 8. Permanently mark components with symbols shown on wiring diagrams.
- 9. Provide control panel compliant with UL 508A SB.SCCR of 5000A required.
- F. Electrical Wiring and Wiring Connections:
 - 1. Conductors and Connections:
 - a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
 - 2. The use of splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes is prohibited. Conduit:
 - a. Galvanized steel conduit, EMT, or duct.
 - b. Flexible conduit length not to exceed 6'-0".
 - 3. Traveling Cables:
 - a. Tag spares in equipment space.
 - b. Provide cables from controller to car top.
 - 4. Auxiliary Disconnect:
 - a. Provide controller or machine mounted auxiliary, lockable "open" disconnect.
 - 5. Auxiliary Wiring:
 - a. Provide dedicated equipment space junction boxes for the following:
 - 1) Fire alarm initiating devices.
 - 2) Emergency two-way communication system.

- 3) Network connectivity.
 - 4) Firefighters' phone jack.
 - 5) Paging speaker.
 - 6) CCTV.
 - 7) Digital video display.
 - 8) Security system and card reader interface terminals and relays.
 - 9) Intercom, announcement speaker and/or background music.
- b. Provide conduit, wiring and connections from controller space junction box to each controller in the equipment space for the following:
- 1) Fire alarm initiating devices.
 - 2) Emergency two-way communication system.
 - 3) Network connectivity.
 - 4) Firefighters' phone jack.
 - 5) Paging speaker.
 - 6) CCTV.
 - 7) Digital video display.
 - 8) Security system and card reader interface terminals and relays.
 - 9) Intercom, announcement speaker and/or background music.

2.8 HOISTWAY EQUIPMENT

A. Gearless Traction Hoist Machine:

1. AC induction or P.M.S.M. ACV³F gearless traction motor with brakes, drive sheave, and deflector sheave mounted in proper alignment.
2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
3. Provide machine with an electromechanical brake.
 - a. The brake is spring applied and electrically released.
 - b. Brake shoes are applied to the braking surface simultaneously and with equal pressure.
4. Provide means to prevent ascending car over-speed and unintended car movement via dual modular redundant braking system.
5. Provide ladders and platforms with handrails and toe boards for overhead sheave and governor access within the bounds of the equipment space.

B. Machine and Equipment Support Beams:

1. 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.
2. Provide bearing plates, anchors, shelf angles, blocking, embedment, for support and fastening of machine beams or equipment to the building structure.
3. Isolate machine and overhead sheave beams to prevent noise and vibration transmission to building structure.

C. Governor:

1. Centrifugal-type, car driven with pull-through jaws and bi-directional shutdown switches.
2. Provide required bracketing and supports for attachment to building structure.

3. Provide manual remote reset capability at controller.
- D. Guide Rails:
 1. Planed steel T-sections for car and counterweight of suitable size and weight for the application, including brackets for attachment to building structure.
 2. No additional structural points of attachment other than those shown on the Contract Documents will be provided.
 3. Provide rail backing and intermediate counterweight tie brackets.
 4. Provide bracketing, at top and bottom of floor beams.
- E. Sheaves:
 1. Machined grooves and sealed bearings.
 2. Provide mounting to machine beams, car, and counterweight structural members, or building structure.
- F. Counterweight:
 1. Steel frame with metal filler weights.
- G. Counterweight Guides:
 1. Spring dampened roller guides.
- H. Counterweight Runway Guard:
 1. Where counterweight is located between adjacent elevators, provide counterweight guard along entire runway next to the adjacent elevator.
- I. Governor Rope and Encoder Tape Tensioning Sheaves:
 1. Mount sheaves and support frame on pit floor or guide rail.
 2. Provide frame with guides or pivot point to enable free vertical movement and proper tension of rope and tape.
- J. Suspension Means:
 1. 8 x 19 or 8 x 25 Seale construction, traction steel.
 - a. Fasten with staggered length, adjustable, spring isolated wedge shackles.
 2. Fire-Rated, Noncircular elastomeric-coated steel belt comprising of several steel cords arranged in parallel and molded within a coating.
 3. Approved governor rope.
- K. Terminal Stopping:
 1. Provide normal and final devices.
- L. Electrical Wiring and Wiring Connections:
 1. Conductors and Connections:
 - a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
 - b. The use of splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes is prohibited.
 - c. Provide 20% spare conductors for each wire type.
 - d. Run spare wires from car connection points to individual elevator controllers in the equipment space.
 2. Conduit:
 - a. Galvanized steel conduit, EMT, or duct.
 - b. Flexible conduit between isolated equipment, length not to exceed 3'-0".

- c. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
 - d. Coordinate conduit from the closest hoistway of each elevator or group or single elevator to the firefighters' control panel control console. Provide wiring.
 - 3. Traveling Cables:
 - a. Flame and moisture-resistant outer cover.
 - b. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
 - c. Provide the following minimum composition, which are not considered spares:
 - 1) Five pair of shielded 20-gauge wire for card reader.
 - 2) Two pair of shielded 18-gauge wire for CCTV, from car controller to car top junction box, plus 3'-0" excess loop at both ends.
 - 3) Two pair of 18-gauge wire for CCTV power.
 - 4) Two pair of 18-gauge wire for emergency communication system power.
 - 5) Two pair of 18-gauge wire for network connectivity power.
 - d. Provide eight pair of spare shielded communication wires in addition to those required to connect specified items.
 - e. Tag spares in control room. Provide cables from controller to car top.
 - f. Support traveling cable by suspending from supports by means that automatically tighten around the cable when tension is increased
 - 4. Auxiliary Wiring:
 - a. Provide conduit, wiring and connections for systems specified.
 - M. Entrance Equipment:
 - 1. Two-point hanger roller with non-metallic roller surface and suspension with eccentric upthrust roller adjustment.
 - 2. Bar or formed, cold-drawn removable steel door tracks with smooth roller contact surface.
 - 3. Door Interlocks:
 - a. Operable door locks without retiring cam.
 - 4. Door Closers:
 - a. Spring, spirator, weighted, or jamb/strut mounted.
 - b. Design and adjust to ensure a smooth and quiet mechanical close of doors.
 - N. Floor Numbers:
 - 1. Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors and hoistway fascia. Must be visible from within car.
- 2.9 HOISTWAY ENTRANCES
- A. Entrance Assemblies:
 - 1. Complete entrances bearing fire labels from a certified testing laboratory approved by authority having jurisdiction.
 - 2. Provide entrance assemblies bearing 1-1/2hr label.

3. Paint all exposed ferrous metal black.
- B. Frames:
1. Bolted and lapped head to jamb assembly at all floors.
 2. Provide Arabic floor designation/Tactile marking plates:
 - a. Centered at 60" above finished floor.
 - b. Located on both side jambs of all entrances.
 - c. Minimum 4" in height.
 - d. Tactile indications below Arabic floor designation.
 - e. Permanently fastened.
 3. Provide car identification label:
 - a. Mounted directly below floor designation/Tactile marking plates.
 - b. Located on both side jambs at the following levels:
 - 1) Designated Level.
 - 2) Alternate Level.
 - 3) Level designated for testing.
 - c. Finish and design to match floor designation/Tactile marking plates.
 - d. Permanently fastened.
 4. Provide plates at main egress landing with "Star" designation.
- C. Door Panels:
1. Sandwich construction without binder angles.
 2. Provide one leading edge of doors with rubber astragals.
 3. Provide a minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel.
 4. Provide one separate 4" steel reinforcement safety gib mounted between door gibs, where not integrated with door gibs.
- D. Sight Guards:
1. Same material, finish, and height as hoistway entrance door panels.
 2. Construct without sharp edges.
- E. Sills:
1. Passenger Cars 1-2: Extruded aluminum.
 2. Service Car S1: Nickel silver.
- F. Sill Supports:
1. Structural or formed steel designed to support sill load.
 2. Design to eliminate need for grout under the sill.
 6. For service Car S1, provide 5" x 5" x 1/2" structural steel angle, extending full width of hoistway. Fasten to building structure at maximum 18" O.C.
- G. Fascia, Platform Guards and Hanger Covers:
1. 16-gauge furniture steel with Contractor's standard finish.
- H. Struts and Headers:
1. Provide support of all entrances to building structure including connections to building structure.
 2. Provide door open bumpers on entrances equipped with vertical struts.
- I. Finish of Frames and Doors:

1. Satin finish stainless-steel
- J. Hoistway Access:
1. Hoistway Door Unlocking Device:
 - a. Provide unlocking device with locking escutcheon in door panel at all floors, with finish to match adjacent surface.
 2. Hoistway Access Switches:
 - a. Mount in entrance frame side jamb at top floor.
 - b. Provide switch without faceplate.
- 2.10 PIT EQUIPMENT
- A. Buffers:
1. Provide Oil type with blocking and support channels.
- B. Pit Access:
1. Hoistway Access Key Switch:
 - a. Provide key switch at lowest terminal landing.
 - b. Mount in entrance frame side jamb.
 - c. Provide switch without faceplate.
 2. Provide pit stop switches.
- C. Counterweight Guard:
1. Metal guard in pit in front of counterweight where no compensation is provided or where there is no space greater than 20 inches between the compensation means, suspension means, counterweight rails, or guards.
- 2.11 CAR EQUIPMENT
- A. Frame:
1. Welded or bolted, rolled or formed steel channel construction to meet load classification specified.
- B. Safety Device:
1. Type "B," flexible guide clamp.
- C. Platform:
1. Design and construct to accommodate load classification requirements.
 - a. Provide Class "A" construction for all elevators.
 - b. Provide 1" recess to accommodate floor and subfloor thickness.
 - c. Allow 350 lbs. for floor weight.
 2. The car platform consists of a steel frame with necessary steel stringers, all securely welded together.
 3. Isolate the passenger elevator platform.
 - a. The support frame includes rubber pads on which the platform rests.
 - b. No mechanical connections between platform and frame.
 4. Work Light Fixtures & AC Receptacles:
 - a. Provide permanent mounted work light fixtures below platform, complete with proper lamp guards.

- D. Platform Apron:
 - 1. Minimum 48" high, reinforced and braced to car platform front with Manufacturer's standard finish
- E. Cartop Guard Rail:
 - 1. Provide a railing system provided on the outside perimeter of the car top on all sides where the horizontal distance between the edges of the car top and the adjacent hoistway enclosure exceeds 12 inches.
- F. Car Guides:
 - 1. Roller type with three or more spring dampened, sound-deadening rollers per shoe.
- G. Cab Steadying Plates:
 - 1. Provide and install top of car steadying plates.
 - 2. Emphasis is placed on proper tension to car styles allowing minimal lateral movement of the cab.
 - 3. Steadying plates are isolated using non-metallic guides or rollers.
- H. Sills:
 - 1. One-piece extrusion with extension between car entrance columns to face of car front return.
 - 2. Extruded extension to match finish of sill.
 - a. Cars 1-2: Aluminum.
 - b. Car S1: Nickel silver.
- I. Door Panels:
 - 1. Sandwich construction without binder angles.
 - 2. Provide one leading edges of doors with rubber astragals.
 - 3. Provide a minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel.
 - 4. Construct door panels with interlocking, stiffening ribs.
- J. Door Hangers:
 - 1. Two-point suspension.
 - 2. Hanger roller with non-metallic surface and eccentric roller adjustment.
- K. Door Track:
 - 1. Bar or formed, cold-drawn removable steel track with smooth roller contact surface.
- L. Door Header:
 - 1. Construct of minimum 12-gauge steel, shape to provide stiffening flanges.
- M. Door Electrical Contact:
 - 1. Prohibit car operation unless car door is closed.
- N. Door Clutch:
 - 1. Heavy-duty clutch, linkage arms, vane assembly and pickup rollers or cams to provide positive, smooth, quiet door operation.
 - 2. Design clutch so car doors can be closed while hoistway doors remain open.
- O. Restricted Opening Device:

1. Provide mechanical car-door restrictor to prevent opening of doors when outside unlocking zone.
 2. Plunger type restrictors are not applicable.
 3. Utilize mechanical angle to prevent door opening.
- P. Door Operator:
1. High speed, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
 2. Accomplish reversal within 2½" of door movement.
 3. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
 4. Provide a minimum of four controller-based motion profiles, per floor, per door, to maintain consistent, smooth, and quiet door operation at all floors, regardless of door weight or varying air pressure.
- Q. Door Reversing Device:
1. Infrared Reopening Device:
 - a. 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 74" above finished floor.
 - b. Provide 3D beam device to detect approach from elevator lobby.
 - c. Reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudging operation.
 - d. In event of device failure, provide for automatic shutdown of car at floor level with doors open.
 2. Nudging Operation:
 - a. After door close is obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), warning signal sounds, and doors close with a maximum of 2.5 foot-pounds kinetic energy.
 - b. Door open button overrides nudging operation and reopen doors.
 3. Interrupted Beam Time:
 - a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
 - b. When beams are interrupted after the initial 3.0 second hold open time, reduce remaining adjustable open time to 1.0-1.5 seconds after beams are reestablished.
 4. Differential Door Time:
 - a. Provide separate adjustable timers to vary door dwell time after stopping in response to calls.
 - b. Car Call:
 - 1) Hold open time adjustable between 3.0 and 5.0 seconds.
 - c. Hall Call:
 - 1) Hold open time adjustable between 5.0 and 8.0 seconds.
 - 2) Use hall call time when car responds to coincidental calls.
- R. Car Operating Panel:
1. Passenger:

- a. Two car operating panels without faceplates:
 - 1) Consisting of a metal box containing the vandal resistant operating fixtures, mounted behind the car swing front return panels.
 - b. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with cast stainless tactile symbols recessed flush mounted.
 - c. Pushbuttons:
 - 1) Provide minimum 3/4" diameter raised or flush floor pushbuttons which illuminate to indicate call registration.
 - 2) Provide brushed stainless-steel buttons with illuminated LED halo.
 - d. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
 - e. Locked Firefighters Operation Panel:
 - 1) For fire officer use and independent service only.
 - 2) Openable by the same key which operates the Fire Operation switch.
 - 3) Including the following features:
 - a) Phase II fire access switch.
 - b) Firefighters' visual indication.
 - c) Call cancel button.
 - d) Stop switch, manually operated.
 - e) Door open button.
 - f) Door close button.
 - g) Floors served.
 - h) Fire communication jack.
 - f. Provide "door open" button to stop and reopen doors or hold doors in open position.
 - g. Provide "door close" button to activate door close cycle.
 - 1) Cycle does not begin until normal door dwell time for a car or hall call has expired, except firefighters' operation.
7. Service:
- h. One car operating panel with faceplate:
 - 1) Consisting of a metal box containing the vandal resistant operating fixtures, mounted behind the car stationary front return panel.
 - 2) Faceplates are hinged and constructed of No. 4 satin finish stainless-steel.
 - i. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with cast stainless tactile symbols recessed flush mounted.
 - j. Pushbuttons:
 - 1) Provide minimum 3/4" diameter raised or flush floor pushbuttons which illuminate to indicate call registration.
 - 2) Provide brushed stainless-steel buttons with illuminated LED halo.
 - k. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
 - l. Locked Firefighters Operation Panel:
 - 1) For fire officer use and independent service only.

- 2) Openable by the same key which operates the Fire Operation switch.
 - 3) Including the following features:
 - a) Phase II fire access switch.
 - b) Firefighters' visual indication.
 - c) Call cancel button.
 - d) Stop switch, manually operated.
 - e) Door open button.
 - f) Door close button.
 - g) Floors served.
 - h) Fire communication jack.
 - m. Provide "door open" button to stop and reopen doors or hold doors in open position.
 - n. Provide "door close" button to activate door close cycle.
 - 1) Cycle does not begin until normal door dwell time for a car or hall call has expired, except firefighters' operation.
 2. Service Compartment:
 - a. Provide lockable service compartment with recessed flush door.
 - b. Door material and finish matches car return panel or car operating panel faceplate.
 - c. Inside surface of door contains an integral flush window for displaying the elevator operating permit.
 - d. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
 - 1) Access switch.
 - 2) Light switch.
 - 3) 4-position Exhaust blower switch.
 - 4) Independent service switch.
 - 5) Constant pressure test button for battery pack emergency lighting.
 - 6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
 - 7) Card reader override switch.
 - 8) Keyed stop switch.
 3. Provide black filled, engraved, or approved etched signage as follows with approved size and font:
 - a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
 - b. Red filled engraved firefighters' operation on outside face of compartment door.
 - c. Building identification car number over main and auxiliary car operating panel.
 - d. Car capacity in pounds on service compartment door.
 - e. "No Smoking" over main car operating panel.
 4. No visible manufacturer's name, logo, or other branding.
- S. Car Top Control Station:
1. Mount to provide safe access and utilization while standing on car top.

2. Operating device contains Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
 3. Operating device contains an audible and visible indicator that fire recall has been initiated.
 4. This station is fixed to the car crosshead or may be portable provided the extension cord and housing are permanently attached to the car crosshead.
 5. The car will be operated by constant pressure on the appropriate direction button and the Run button simultaneously.
 6. Normal operating devices will be inoperative while this device is in use.
- T. Emergency Audible Signaling:
1. Provide on top of each elevator.
 2. Activation of the Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
 3. Provide auxiliary power supply to provide 1hr power in the event of normal power loss.
- U. Work Light and Duplex Plug Receptacles:
1. GFCI protected outlet at top and bottom of car.
 2. Include on/off switch and lamp guard.
 3. Provide additional GFCI protected circuit and dedicated junction box on car top for installation of car CCTV.
 4. Provide additional GFCI protected circuit and dedicated junction box on car top for installation of car digital video display.

2.12 CAR ENCLOSURE

- A. Passenger Elevator: Provide complete as specified herein and detailed on architectural drawings.
1. Shell:
 - a. Reinforced formed furniture steel panels with baked enamel interior finish.
 - b. Apply sound-deadening mastic to exterior.
 - c. Provide concealed ventilation cutouts.
 2. Canopy:
 - a. Reinforced formed furniture steel panels with lockable, contacted, hinged emergency exit.
 - b. Interior finish white color reflective baked enamel.
 3. Front Swing Return Panels and Integral Entrance Columns:
 - a. Reinforced furniture steel clad with satin finish stainless-steel.
 - b. Swing entire unit on substantial pivot points for service access to car operating panels.
 - c. Locate pivot points to provide full swing of return panel without interference with side wall finish or handrail.
 - d. Secure in closed position with concealed three-point latch.
 - e. Provide firefighters' and service compartments with recessed flush cover and cutouts for operating switches.
 4. Transom:

- a. Reinforced furniture steel clad with satin finish stainless-steel full width of enclosure.
 5. Base:
 - a. Stainless-steel with concealed ventilation cutouts.
 6. Finish Floor Covering:
 - a. Furnished under other sections.
 - b. Accommodate floor and subfloor thickness.
 7. Interior Wall Finish:
 - a. Removable horizontal panels faced and edged, with color core plastic laminate, color and finish as selected. Side and rear walls.
 - b. Brushed stainless-steel reveals.
 8. Ventilation:
 - a. Forced Ventilation
 - 1) 3-speed blower mounted to car canopy.
 - 2) Exhaust blower meets noise and vibration criteria.
 9. Lighting:
 - a. Provide LED fixtures with wiring and hookup.
 - b. Coordinate with emergency lighting requirements.
 10. Suspended Ceiling:
 - a. Six-section satin finish stainless-steel panels with round lighting cutouts in each panel.
 11. Handrails:
 - a. Stainless-steel flat grab bar with backing plates and captive nuts across rear wall and side walls.
 - b. Bolt rails through car walls from back and mount on 1½" deep solid round stainless-steel standoff spacers no more than 18" O.C.
 - c. Provide at 32 in. above finished floor, as indicated on Architectural drawings.
 - d. Return handrail/guardrail ends to car walls.
 12. Pads and Buttons or Hooks, one set for Cars 1-2:
 - a. Three-piece removable pads.
 - b. Two pads covering side walls and adjacent front returns and one covering rear wall.
 - c. Provide cutouts to access main car operating panel.
- B. Service Elevator: Provide complete as specified herein.
1. Shell:
 - a. Reinforced textured finish stainless-steel formed panels no more than 18" wide with light-proof joints.
 - b. Apply sound deadening mastic to exterior.
 2. Canopy:
 - a. Reinforced furniture steel formed panels with lockable, contacted, hinged emergency exit.
 - b. Interior finish white reflective baked enamel.
 3. Front Stationary Return Panels:

- a. Reinforced furniture steel clad with textured finish stainless-steel.
4. Entrance Columns and Transom:
 - a. Reinforced furniture steel clad with textured finish stainless-steel.
5. Base:
 - a. Stainless-steel with concealed ventilation cutouts.
6. Finish Floor Covering:
 - a. Furnished under other sections.
 - b. Accommodate floor and subfloor thickness.
7. Interior Wall Finish:
 - a. Removable panels faced and edged, with textured finish stainless-steel, SWL pattern.
 - b. Brushed stainless-steel reveals.
8. Ventilation:
 - c. Forced Ventilation
 - 1) 3-speed blower mounted to car canopy.
 - 2) Exhaust blower meets noise and vibration criteria.
9. Lighting:
 - d. Provide LED fixtures with wiring and hookup.
 - e. Coordinate with emergency lighting requirements.
10. Suspended Ceiling:
 - a. Nine-section satin finish stainless-steel panels with round lighting cutouts in each panel.
11. Handrails/Guardrails:
 - b. Two rows.
 - c. Top handrail line stainless-steel flat grab bar with backing plates and captive nuts.
 - d. Lower guardrail line 4" x 3/8" solid stainless-steel flat stock bars mounted on both sides and rear of the car.
 - e. Locate bottom guardrail line at 8" above car floor and handrail line at 32" above the car floor.
 - f. Bolt rails through car walls from back and mount on 1½" deep solid round stainless-steel standoff spacers no more than 18" O.C.
 - g. Return handrail/guardrail ends to car walls.
12. Pads and Buttons and Permanently Mounted Hooks:
 - h. Removable pads.
 - i. Two pads covering side walls and adjacent front returns and one covering rear wall.
 - j. Provide cutouts to access main car operating panel and fire service panel.

2.13 HALL CONTROL STATIONS

- A. Pushbuttons:
 1. Provide one pushbutton riser per bank.
 2. Provide flush mounted faceplates.
 3. Include pushbuttons for each direction of travel that illuminate to indicate call registration.

4. Include engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
5. Pushbutton design matches car operating panel pushbuttons.
6. Provide vandal resistant pushbutton and light assemblies.
7. Provide LED illumination.
8. Provide Phase I Fire Service key switch, engraved operating instructions and illuminating jewel.
9. Provide communication check failure indication and silence key switch.
10. Provide illuminating jewels indicating standby power status.
11. Incorporate all items required by Code at the primary egress level into a single hall fixture.

2.14 SIGNALS

A. Hall Direction Lantern, All Cars:

1. Provide at each entrance to indicate travel direction of arriving car.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction prior to car arrival at floor.
3. Illuminate light until the car doors start to close.
4. Sound level adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time.
6. Hall direction lenses are arrow shaped with faceplates.
7. Lenses are minimum 2½" in their smallest dimension.
8. Locate as detailed on architectural drawings.

B. Hall Position Indicator, All Cars:

1. Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2½" high to indicate floor served and direction of car travel.
2. Mount integral with hall lanterns at main egress floor.
3. Provide only at the Primary landing.

C. Car Position Indicator:

1. Alpha-numeric LCD screens containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in car front return panel above each car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

D. Fixture Faceplate Material and Finish:

1. Satin Stainless-steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

E. Voice Synthesizer:

1. Provide electronic device with easily reprogrammable message and female voice to announce car direction, floor, emergency exiting instructions.

2.15 COMMUNICATION

A. Car Communication System:

1. Hands-Free Phone System:

- a. Two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in control room.
- b. Provide dialer with automatic rollover capability with minimum two numbers:
 - 1) Actuate two-way communication via "Help" button.
 - 2) Adjacent light jewel illuminates and flash when call is acknowledged.
 - 3) Button matches car operating panel pushbutton design.
 - 4) Provide "Help" button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2. Emergency Personnel Communication:

- a. Communication system is provided allowing emergency personnel to establish communications with each elevator individually.
- b. Emergency Personnel Communication overrides any existing connection outside of building.
- c. Adjacent light jewel illuminates and flashes when call is acknowledged.
- d. Provide operating instructions.
- e. On the same car operating panel as the phone push button, provide capability to communicate with and obtain responses from passengers.
- f. Provide display video capability for entrapment assessment.

3. Communication for deaf, hearing and speech impaired:

- a. On the same car operating panel as the phone push button, provide capability to communicate visually with and obtain responses from passengers, including those passengers who cannot communicate verbally or hear.
- b. Provide shielded twisted pair wiring to communicate to control room.
- c. Device shall be open-sourced and capable of being monitored by any entity as selected by the owner. All software, hardware, and training cost associated with the device shall be included within this project. Associated monthly monitoring costs will not be accepted.

4. Intercom System:

a. General:

- 1) Provide intercommunication system complete with talkback speaker, required auxiliary equipment and wiring.
- 2) Include a preamplifier and associated equipment required to receive input from building.
- 3) A battery backup system is provided for the two-way conversation system.
 - a) Battery backup system capable of providing power for a minimum of four (4) hours.

- 4) If it is determined that there will not be a 24-hour manned station on the premises, then the system provided is capable of dialing to a 24-hour manned answering service or must be of the automatic dialing system and not an intercommunication system.
 - a) In locations that call for Master Stations, a phone with a dedicated line is provided (by others).
 - b. Master Stations:
 - 1) Fire Control Station
 - a) Arrange to communicate with any other station, any group of stations or all stations simultaneously; include following devices:

Combination speaker-microphone.
Selector buttons for each station in system.
A button for simultaneous conversation with all stations in system.
Talk-listen button; press to talk, release to listen.
IN USE light to indicate when any master station is in use.
Reset Button; to disconnect call, extinguish in use light, and reset selection buttons to free system for next call.
Volume control.
 - 2) Control Rooms:
 - a) Arrange to communicate with other master stations and all elevator cars.
 - b) In addition to devices specified for Fire Control Station, provide a loud audible signal to announce calls to this unit.
 - c. Remote Stations:
 - 1) Provide combination speaker microphone in each elevator car as specified:
 - a) Arrange to communicate with all master stations.
- B. Remote Monitoring:
1. Provide system to capture faults or system shutdowns in real-time occurrence.
 2. Communicate faults or shutdowns to reception system, enabling automatic dispatch of technicians.
 3. System monitors faults 24-hours per day, 7-days per week.
 4. Perform predictive fault monitoring, enabling service call assignment prior to predicted component failure and elevator shutdown.
 5. System provides initial assessment of component failure to technicians prior to dispatching, enabling faster system recovery and reduced down-time.
- C. Elevator Management System and Information:
1. General:
 - a. Each controller provides an extensive list of output information, including data logging, fault logs operational events, performance information including car speed, floor to floor times, and door times.
 - b. The system is real time, capable of driving remote monitors or computer terminal systems connected via Intranet system, that continually display the status of each car and call.

- c. Provide each group with a complete, interactive elevator monitoring system.
 2. The system displays all units in a group and separate units on one screen in a graphical format and record the following information for each monitored unit:
 - a. Group status.
 - b. Individual car status with expandable menus.
 - c. Service Driven Outages.
 - d. Maintenance Activity Indicators.
 3. Faults monitored with visual and audible alarm, triggered by combinations of any of the above status points.
 - a. Transmit email when any monitored faults occur.
 4. If out of service 15 minutes, initiate email to designated address. If fault continues more than eight hours, send email hourly until car returned to service.
 5. Reporting Requirements:
 - a. System provides reports in both tabular and graphical format, both on-screen and in printed form capability.
 - b. Data for all reports are continuously recorded and stored.
 - c. Reports are displayed by selecting a date and time range, bank of equipment, and report type.
 - d. Date and time range selections carry forward from one report selection to the next.
 - e. Reporting functions are sub-divided into the following categories:
 - 1) Traffic Reports.
 - 2) Fault Reports.
 - 3) Car Use Statistics.
 - 4) Group Service Log.
 - 5) Playback capability.
- D. Client Interface Tool:
 1. Provide access to real-time data for elevators, including the following:
 - a. Complete service history for all vertical transformation.
 - b. Key performance indicators.
 - c. Access to service request logs, disposition, and total downtime.
 - d. Create service requests.
 - e. View customer contracts.
 - f. View and or accept Work Orders.
 - g. Provide document repository.
 2. Data is accessible from any device, including mobile.
 3. Proper safeguards are confirmed, protecting clients from malware and virus receipt.

2.16 FIREFIGHTERS' CONTROL PANEL

- A. Firefighters' Control Panel:
 1. Locate in building fire control room or as directed by Contractor.
 2. Fixture faceplate, stainless-steel, satin finish, includes the following features:

- a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
 - 1) Identify each position indicator with car number and group identification.
 - b. Indicator showing operating status of car.
 - c. Manual car standby power selection switches and power status indicators.
 - d. Two-position firefighters' emergency return switches and indicators with engraved red filled instructions.
 - e. Floors served.
 - f. Firefighters' telephone jack.
 - g. Identify all indicators and manual switches with appropriate engraving.
3. Provide wiring to control panel.
 - a. Coordinate size and location of conduit with Contractor.
- B. Firefighters' Key Box:
1. Flush-mounted box with lockable hinged cover.
 2. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to beginning installation of equipment examine hoistway and control room areas.
- B. Verify no irregularities exist that affect execution of work specified.
- C. Verify electrical power location and characteristics in coordination with equipment requirements.
- D. Do not proceed with installation until work in place conforms to project requirements.

3.2 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. Provide any required hoisting/safety beams.
- 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.
- G. Fill hoistway door frames, back boxes for hallway stations and signal devices, and sills.
- H. Clean all architectural finishes and replace or restore any surfaces damaged during construction to like new condition.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing:
1. On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Operating Test:
1. Load one elevator of each type, capacity, speed, and travel distance to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next.
 2. Record temperature rise of elevator machine during 30-minute test period.
 3. Record failure to perform as required.
- C. Advise Contractor, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.
- D. Independent Testing by Owner's Consultant.

3.4 CONSTRUCTION TOLERANCES

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

3.5 ADJUSTING

- A. Static balance car to equalize pressure of guide shoes on guide rails.
1. Dynamically balance car and counterweight.
- B. Lubricate all equipment in accordance with Contractor's instructions.
- C. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve specified performance levels.

3.6 CLEANING

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

- C. Remove all loose materials and filings resulting from work.
- D. Clean control room equipment and floor.
- E. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.
- F. Clean pit equipment and floor.

3.7 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate all aspects of elevators while in normal operation.
- B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period.
 - 1. Determine that operation systems and devices are functioning properly.

3.8 PROTECTION

- A. Temporary Use: Comply with the following requirements for each elevator used for construction purposes:
 - 1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
 - 2. Provide strippable protective film on entrance and car doors and frames.
 - 3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
 - 4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
 - 5. Do not load elevators beyond their rated weight capacity.
 - 6. Engage elevator Installer to provide full maintenance service.
 - a. Include preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity.
 - b. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
 - 7. Engage Elevator Installer to restore damaged work, if any, so no evidence remains of correction.
 - a. Return items which cannot be refinished in the field to the shop, make required repairs, and refinish entire unit, or provide new units as required.

END OF SECTION

2. Your Solution

Elevator Technical Specification

	Group 1 Elevator B	Elevator C	Group 2 Service Elevator A
Base solution			
KONE Solution	KONE MonoSpace 500 DX	KONE MonoSpace 500 DX	KONE MonoSpace 500 DX
Machinery location	Guiderail-mounted in overhead of hoistway	Guiderail-mounted in overhead of hoistway	Guiderail-mounted in overhead of hoistway
Capacity (lb)	3500	3500	5200
Speed (fpm)	350	350	200
Travel height (ft)	60 ft 8 in	60 ft 8 in	76 ft 8 in
Stops	6	6	5
Front entrances	6	6	5
Rear entrances	0	0	0
Control system	Full collective Duplex	Full collective Duplex	Full collective Simplex
IBC seismic design Category	B	B	B
Value (IP) (SDS)	0	0	0
Regulations	ASME A17.1-2019	ASME A17.1-2019	ASME A17.1-2019
KONE Environmental Product Declarations	https://www.kone.com/en/products-and-services/green-building/lifecycle-impact-assessments/		
Shaft construction			
Shaft size (W x D) (ft)	8 ft 8 in x 7 ft 6 in	8 ft 8 in x 7 ft 6 in	8 ft 0 in x 10 ft 9 in
Pit depth (ft)	5 ft 6 in	5 ft 6 in	5 ft 0 in
Clear Height under Ceiling (ft)	16 ft 8 in	16 ft 8 in	16 ft 8 in
Headroom Bracket attach type B side	C-insert UNISTRUT (8)	C-insert UNISTRUT (8)	Expansion anchor, CMU (11)
Headroom Bracket attach type D side	C-insert UNISTRUT (8)	C-insert UNISTRUT (8)	Expansion anchor, CMU (11)
Mechanical components & machinery			
Power supply, machinery (V / Hz)	480 / 60	480 / 60	480 / 60
Car and doors			
Car size (WxDxH) (in)	6 ft 5.7188 in wide x 5 ft 6.6875 in deep x 8 ft 0 in high	6 ft 5.7188 in wide x 5 ft 6.6875 in deep x 8 ft 0 in high	5 ft 9.5 in wide x 9 ft 0.4844 in deep x 10 ft 0 in high
Door opening dimensions (WxH) (ft)	3 ft 6 in x 7 ft 0 in	3 ft 6 in x 7 ft 0 in	4 ft 6 in x 9 ft 0 in
Controller location	Above top landing Hoistway to controller (horz) [ft]: 25	Above top landing Hoistway to controller (horz) [ft]: 25	Above top landing Hoistway to controller (horz) [ft]: 25

Design Group 1 - Elevator B



Rear and Side walls

Front and Side walls



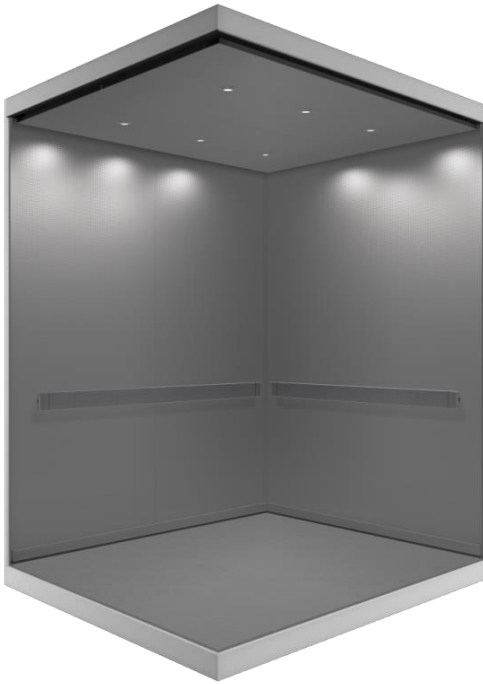
Do you want to see the design in 3D view?
Click below

→ KONE CAR DESIGNER



<https://cardesigner.kone.us/#/doc/4256cc5f-5f33-40c4-8215-db3169fe6049>

Design Group 1 - Elevator C



Rear and Side walls



Front and Side walls



Do you want to see the design in 3D view?
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→ KONE CAR DESIGNER



<https://cardesigner.kone.us/#/doc/eabfe2f0-7fb7-4153-8d73-97e22e7137f5>

Design Group 2 - Service Elevator A



Rear and Side walls

Front and Side walls



Do you want to see the design in 3D view?
Click below

→ KONE CAR DESIGNER



<https://cardesigner.kone.us/#/doc/36715b6c-dbcd-47ea-9299-a91cf65048f4>

Materials and design

Please note that all images are for illustration purposes only. Some differences to actual product delivered may exist including number of wall panels, orientation of design, etc. Final approved layout drawings will reflect the actual cab design.

Elevator Elevator B

Car walls	Scottish Quad - Textured Stainless Steel
Front wall	#4 Brushed Stainless Steel, pan type door
Ceiling	Round, LED spotlights (CL88) #4 Brushed Stainless Steel
Flooring by others	Maximum floor thickness: 1 in Maximum floor weight: 6 lb/ft ²
Handrail	Flat, straight ends (HR63) #4 Brushed Stainless Steel Handrail on side and rear walls
Skirting	#4 Brushed Stainless Steel
Car Fan	Fan Required
Protection pads	KONE standard pads and hooks included

Door type	Single-speed, right-hand, side-opening
Door material	#4 Brushed Stainless Steel
Sill material	Aluminum
Number of car operating panels (COP)	1
COP details	Dot matrix Flush #4 Brushed Stainless Steel Vertical (VER) Media screen all in 1 (CM3)
Jamb mounted destination indicator	Car Lantern (jamb-mounted) included
Signalization Series	KSS570 series signalization

Additional Options

24/7 Emergency Communications	Yes
Hall/Lobby panel included	No
Locking of car calls switch type	Card Reader Provisions

Hazard Avoidance

Emergency power drive	Emergency power drive included (generator by others)
Elev. flood detection device	0; No device
Shaft light required	0, not ordered
Operation of car ventilation	KONE Standard Fan
Regenerative drive	Yes

Landing	Floor Marking	Landing Sill Material	Finish	Entrance Frame type	Hall Lantern / Position Indicator
6 Front	5	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
5 Front	4	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
4 Front	3	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
3 Front	2	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
2 Front	*1	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
1 Front	B1	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator

Elevator Elevator C

Car walls	Scottish Quad - Textured Stainless Steel
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Front wall	#4 Brushed Stainless Steel, pan type door
Ceiling	Round, LED spotlights (CL88) #4 Brushed Stainless Steel
Flooring by others	Maximum floor thickness: 1 in Maximum floor weight: 6 lb/ft2
Handrail	Flat, straight ends (HR63) #4 Brushed Stainless Steel Handrail on side and rear walls
Skirting	#4 Brushed Stainless Steel
Car Fan	Fan Required
Protection pads	KONE standard pads and hooks included
Door type	Single-speed, right-hand, side-opening
Door material	#4 Brushed Stainless Steel
Sill material	Aluminum
Number of car operating panels (COP)	1
COP details	Dot matrix Flush #4 Brushed Stainless Steel Vertical (VER) Media screen all in 1 (CM3)
Jamb mounted destination indicator	Car Lantern (jamb-mounted) included
Signalization Series	KSS570 series signalization

Additional Options

24/7 Emergency Communications	Yes
Hall/Lobby panel included	No
Locking of car calls switch type	Card Reader Provisions

Hazard Avoidance

Emergency power drive	Emergency power drive included (generator by others)
Elev. flood detection device	0; No device
Shaft light required	0, not ordered
Operation of car ventilation	KONE Standard Fan
Regenerative drive	Yes

Landing	Floor Marking	Landing Sill Material	Finish	Entrance Frame type	Hall Lantern / Position Indicator
6 Front	5	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None
5 Front	4	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None
4 Front	3	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None
3 Front	2	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None
2 Front	*1	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None
1 Front	B1	Aluminum	#4 Brushed Stainless	Knock-down style bolted frames	None

Elevator Service Elevator A

Car walls	Scottish Quad - Textured Stainless Steel
Front wall	#4 Brushed Stainless Steel, pan type door
Ceiling	Round, LED spotlights (CL88) #4 Brushed Stainless Steel
Flooring by others	Maximum floor thickness: 1 in Maximum floor weight: 1 lb/ft ²
Handrail	Flat, straight ends (HR63) #4 Brushed Stainless Steel Handrail on side and rear walls
Skirting	#4 Brushed Stainless Steel
Car Fan	Fan Required
Protection pads	KONE standard pads and hooks included
Door type	Two-speed, left-hand, side-opening
Door material	#4 Brushed Stainless Steel
Sill material	Aluminum
Number of car operating panels (COP)	1
COP details	Dot matrix Swing return #4 Brushed Stainless Steel Vertical (VER) Media screen all in 1 (CM3)
Jamb mounted destination indicator	Car Lantern (jamb-mounted) included
Signalization Series	KSS570 series signalization

Additional Options

24/7 Emergency Communications	Yes
-------------------------------	-----

Hall/Lobby panel included No
 Locking of car calls switch type Card Reader Provisions

Hazard Avoidance

Emergency power drive Emergency power drive included (generator by others)
 Elev. flood detection device 0; No device
 Shaft light required 0, not ordered
 Operation of car ventilation KONE Standard Fan
 Regenerative drive Yes

Landing	Floor Marking	Landing Sill Material	Finish	Entrance Frame type	Hall Lantern / Position Indicator
5 Front	6	Nickel Silver	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
4 Front	5	Nickel Silver	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
3 Front	3	Nickel Silver	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
2 Front	*1	Nickel Silver	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator
1 Front	B1	Nickel Silver	#4 Brushed Stainless	Knock-down style bolted frames	Lantern / Position Indicator

Dedicated to People Flow®



CONNECTING MORE THAN FLOORS

KONE MonoSpace® DX

THE ELEVATOR EXPERIENCE, REDEFINED

In an increasingly digitalized world, everything is connected, and elevators are no exception. The KONE MonoSpace® DX redefines the elevator experience with enabled connectivity for improved people flow and a completely new and inspiring user experience.

DX stands for digital experience because with the KONE MonoSpace DX you can create an experience that really connects, on every level.

1

Connected people flow solutions enable a redefined user experience.

By adding connectivity to your elevators you make them smarter and more desirable – helping you get more value out of every square foot. New services enabled by the KONE digital platform and KONE Partner Ecosystem, as well as application programming interfaces (APIs), make everyday life even easier and more convenient for everyone.

2

Improved elevator offerings provide better customer value.

As the undisputed leader in machine roomless technology, we've continually refined this innovative solution for even greater value for low-, mid- and high-rise buildings. Whether you're developing a new building or replacing the elevator equipment in an existing one, we have a solution that fits the needs of your building tenants.

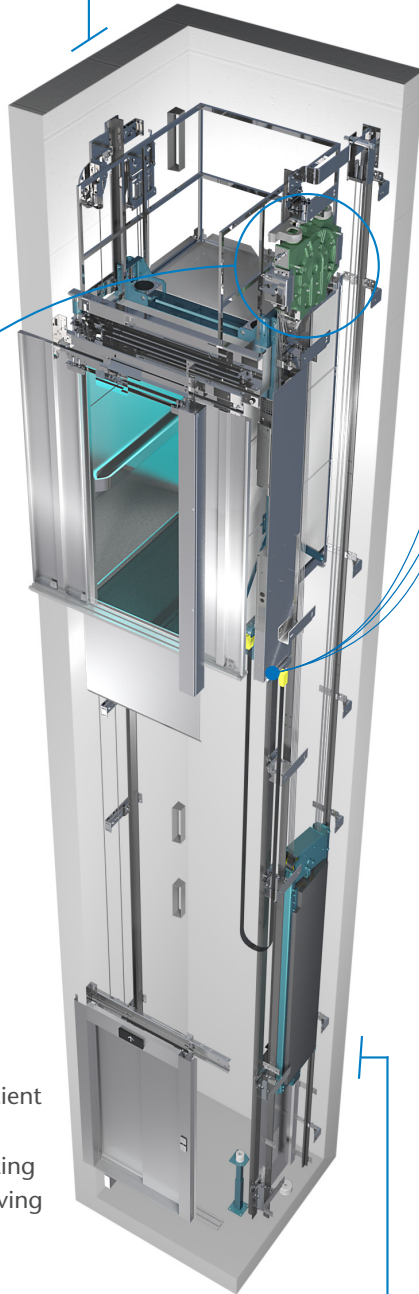
3

Construction and Modernization Delivery Excellence

The building industry is changing and developing. New construction and modernization projects are becoming more complex and project schedules are becoming increasingly tight. We are a leader in delivery excellence providing innovative and highly advanced installation methods, consistent quality, and expertise of our trained field teams.

Easy to upgrade

With easy digital integration and the possibility to upgrade in the future as your needs change, you're all set to add new connected services as and when you need them.



Best-in-class energy efficiency

Save energy and cut your building's carbon footprint with a machine room-less elevator that offers eco-efficient hoisting, high-efficiency regenerative drive, long-lasting LED lighting, and energy-saving standby operation.

Space efficiency

Installing everything inside the elevator shaft frees up space for more profitable use. When completely replacing an elevator we can improve accessibility with a bigger car and wider-opening doors – and even reclaim the machine room as rentable floor space.

FUTURE-PROOF YOUR BUILDING WITH ENABLED CONNECTIVITY

The KONE MonoSpace DX takes our market-leading eco-efficient elevators and adds connectivity to make them smarter and more desirable than ever before.

Connected people flow means your elevator solution never stands still and your building gets better with every update.

To bring you peace of mind in the digital world, our digital services and connectivity offer secure communications. Monitoring our digital environments around the clock for cybersecurity helps us take proper care of them, now and in the future.

GET MORE VALUE OUT OF EVERY SQUARE FOOT WITH ENABLED CONNECTIVITY

In an increasingly connected world, people expect more from the spaces where they live and work. Smart solutions based on connected digital technologies not only help buildings attract a premium price, they also help to speed up the sales or leasing process.

ADD INNOVATIVE SERVICES THAT IMPROVE CONVENIENCE AND COMFORT

KONE MonoSpace DX utilizes the KONE digital platform and secure APIs to connect elevators with a whole new suite of solutions and services that make life easier and more convenient for users.

Take advantage of digital solutions continuously developed by KONE 24/7 Connected Services*, a solution

that uses AI-based analytics, to identify potential issues in your equipment. 24/7 monitoring means you're immediately informed if there is a problem and can plan ahead for future maintenance needs.

With KONE APIs you also have the freedom to develop your own smart building solutions, allowing you to further

customize the elevator experience to meet the needs of your building and its users.

You can also benefit from solutions and services developed by the growing number of partners of the KONE Partner Ecosystem, which develop solutions that can be integrated with KONE DX elevators.

CONSTRUCTION DELIVERY EXCELLENCE

Our solutions and installation methods allow elevator construction to be more efficient by moving materials, elevator equipment and construction workers with ease.



KONE JUMPLIFT

A self-climbing construction time elevator solution uses the building's permanent elevator shaft during construction for smooth logistics that speed up building completion, potentially leading to a quicker return on investment.



KONE STAGED RAIL CART INSTALLATION

For mid- and high-rise buildings it allows all the rails, brackets and hoistway duct to be installed from one lower level as agreed with the contractor. This minimizes materials to be staged on upper floors and limits crane picks and hoist times.



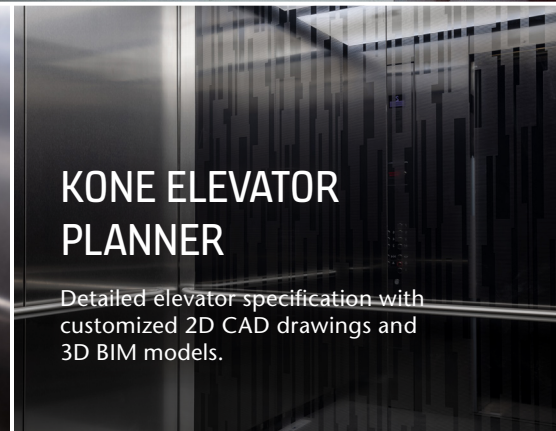
KONE PRE-CONSTRUCTION TOOLS

We use digital planning techniques like building information modeling to prepare for the installation process. This helps you understand and optimize your construction project.



KONE CAR DESIGNER

Choose a theme from the KONE Design Collection, or mix and match your choice of materials, lighting and accessories to create a unique look.



KONE ELEVATOR PLANNER

Detailed elevator specification with customized 2D CAD drawings and 3D BIM models.

PLAN FOR SUCCESS WITH KONE AS YOUR PARTNER

Your journey with KONE is a simple one. In a complex project, the pressure to stay on schedule and within plan is high. Our people and partners, from installers, site supervisors and project managers, are fully committed to the highest customer satisfaction in the industry.

That is why we have the best processes and tools to support you every step of the way.

PROFESSIONAL PROJECT MANAGEMENT

When you buy a solution from KONE, you're getting far more than just equipment and installation. Every single project we handle is led by a professional project manager with solid experience of running similar projects.

SITE READINESS

To make sure everything we need is in place before we begin installation, we can monitor and report the readiness state of the site.

EFFICIENT INSTALLATION

The KONE elevator installation process doesn't require scaffolding, which cuts costs and minimizes disruption to other construction work on site.

QUALITY ASSURANCE AND MAINTENANCE

Before your elevator is handed over, we take every necessary measure to ensure that you're taking delivery of a high-quality solution that will run as it should from day one.

DIFFERENTIATE WITH A REDEFINED USER EXPERIENCE FOR TENANTS AND VISITORS

Deliver a user experience that inspires, informs, and delights. With KONE MonoSpace DX elevators you can harness the power of digitalization to take the elevator journey far beyond the ordinary. Our goal is to create a user experience that both adds value to a building and maximizes comfort and safety for passengers.

KONE DESIGN COLLECTION

Our car interior design creates an aesthetically pleasing experience for each passenger. Get inspiration from predesign cab finishes, mix and match. Choose different handrails, ceilings and signalizations accessories to compliment your elevator.

KONE INFORMATION

A media screen which houses content that either can be controlled by the customer or third party provider to manage content.

SMOOTH AND QUIET RIDE

Enhanced machinery and brakes provides smooth acceleration, deceleration and accurate leveling. Our optimized hoist system and car structure reduce noise inside the elevator car for higher quality passenger experience.

KONE 24/7 EMERGENCY VIDEO COMMUNICATIONS

This solution provides text and voice based two-way communication which includes video capability, allowing our agents to see inside the elevator car in case of an emergency.

KONE MONOSPACE DX ELEVATORS

Not only are our elevators now enabled for connectivity, we enhanced our elevator offering, so low, mid, and high rise buildings can take advantage of our technology. Our KONE MonoSpace 500 DX solution is enhanced to go higher and faster.†

**KONE MonoSpace
500 DX**
5-36 FLOORS
200-500† FEET PER MINUTE
INNOVATIVE DESIGN AT A
PRE-ENGINEERED
VALUE

**KONE MonoSpace
700 DX**
5-36 FLOORS
350-500 FEET PER MINUTE
CUSTOMIZED ENGINEERED
SOLUTIONS

**KONE MonoSpace
300 DX**
2-4 FLOORS
150 FEET PER MINUTE
AFFORDABLE AND
EFFICIENT
INSTALLATION



†Compared to KONE MonoSpace 500. Greater travel and speeds equal to or greater than 500 FPM available in select markets.



KONE provides innovative and eco-efficient solutions for elevators, escalators and the systems that integrate them with today's intelligent buildings.

We support our customers every step of the way; from design, manufacturing and installation to maintenance and modernization. KONE is a global leader in helping our customers manage the smooth flow of people and goods throughout their buildings.

Our commitment to customers is present in all KONE solutions. This makes us a reliable partner throughout the life cycle of the building. We challenge the conventional wisdom of the industry. We are fast, flexible, and we have a well-deserved reputation as a technology leader, with such innovations as KONE MonoSpace® DX, KONE EcoMod® and KONE UltraRope®.

KONE employs over 60,000 dedicated experts to serve you globally and locally.

KONE AMERICAS HEADQUARTERS

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www.kone.us

GET CONNECTED

Scan this code or visit website to get in touch with a KONE Sales Professional:

kone.us/msdx





KONE MONOSPACE® 500 DX

CONFIGURATIONS & DIMENSIONS

Max Travel⁽⁸⁾ 150 ft. (45.7 m)

Speed⁽⁸⁾

150, 200, 350 fpm
(.75, 1.0, 1.78 m/s)

Car Height (F)

8, 9 or 10 ft.
(2438, 2743 or 3048 mm)

Entrance Height (G)

7, 8 or 9 ft.
(2134, 2438 or 2743 mm)

		[A]	[A] SEISMIC	[B]	[B] SEISMIC	[C]	[D]	[E]			
		CAPACITY LBS. (kg)	OPENING TYPE†	HOISTWAY WIDTH (mm)	HOISTWAY WIDTH (mm)	HOISTWAY DEPTH (mm)	HOISTWAY DEPTH (mm)	INTERIOR WIDTH (mm)	INTERIOR DEPTH (mm)	DOOR WIDTH (mm)	STRETCHER ACCOMMODATION ⁽¹⁰⁾
FRONT OPENING	PASSENGER	2000 (907)	SSP	7'-6" (2286)	7'-11" (2413)	5'-9" (1753)	5'-9 1/2" (1766)	5'-8 7/8" (1750)	4'-4 7/8" (1332)	3'-0" (914)	No
		2500 (1134)	SSP / CO	8'-6" (2591)	8'-11" (2718)	5'-9" (1753)	5'-9 1/2" (1766)	6'-8 7/8" (2055)	4'-4 7/8" (1332)	3'-6" (1067)	No
		2500 IBC (1134) ⁽¹⁰⁾	SSP	8'-11" (2718)	9'-5" (2870)	5'-9" (1753)	5'-9 1/2" (1766)	6'-11 3/4" (2128)	4'-4 7/8" (1332)	3'-6" (1067)	Yes
		3000 (1361)	SSP / CO	8'-6" (2591)	8'-9" (2667)	6'-3" (1905)	6'-3 1/2" (1918)	6'-5 3/8" (1971)	5'-0 7/8" (1536)	3'-6" (1067)	No
		3500 (1588)	SSP / CO	8'-6" (2591)	8'-9" (2667)	6'-11" (2108)	6'-11" (2108)	6'-5 3/8" (1971)	5'-6 3/8" (1693)	3'-6" (1067)	Yes
	4000 (1814)	CO	9'-8" (2947)	9'-8" (2947)	6'-11" (2108)	6'-11" (2108)	7'-6 1/8" (2304)	5'-6 3/8" (1693)	4'-0" (1219)	Yes	
	4000 (1814)	2SP	7'-8" (2337)	7'-8" (2337)	9'-2" (2794)	9'-2" (2794)	5'-7 1/8" (1705)	7'-7 7/8" (2334)	4'-0" (1219)	Yes	
	4500 (2041)	2SP	7'-8" (2337)	7'-8" (2337)	9'-8" (2946)	9'-8" (2946)	5'-7 1/8" (1705)	8'-1 7/8" (2486)	4'-0" (1219)	Yes	
	5000 (2268) ⁽⁹⁾	2SP	7'-10" (2388)	7'-10" (2388)	10'-2 1/2" (3112)	10'-2 1/2" (3112)	5'-7 1/8" (1705)	8'-9 1/8" (2685)	4'-6" (1372) ⁽⁹⁾	Yes	
	5000 AIA (2268)	2SP	7'-10 3/16" (2396)	7'-11 1/2" (2426)	10'-5 1/16" (3177)	10'-5 1/16" (3177)	5'-9 7/16" (1764)	9'-0 7/16" (2755)	4'-6" (1372) ⁽⁹⁾	Yes	
FRONT & REVERSE OPENING	PASSENGER	2000 (907)	SSP	7'-6" (2286)	7'-11" (2413)	6'-3 3/4" (1924)	6'-3 3/4" (1924)	5'-8 7/8" (1750)	4'-4 7/8" (1332)	3'-0" (914)	No
		2500 (1134)	SSP / CO	8'-6" (2591)	8'-11" (2718)	6'-3 3/4" (1924)	6'-3 3/4" (1924)	6'-8 7/8" (2055)	4'-4 7/8" (1332)	3'-6" (1067)	No
		2500 IBC (1134) ⁽¹⁰⁾	SSP	8'-11" (2718)	9'-5" (2870)	6'-3 3/4" (1924)	6'-3 3/4" (1924)	6'-11 3/4" (2128)	4'-4 7/8" (1332)	3'-6" (1067)	Yes
		3000 (1361)	SSP / CO	8'-6" (2591)	8'-9" (2667)	6'-11 3/4" (2127)	6'-11 3/4" (2127)	6'-5 3/8" (1971)	5'-0 7/8" (1536)	3'-6" (1067)	No
		3500 (1588) ⁽¹⁰⁾	SSP / CO	8'-6" (2591)	8'-9" (2667)	7'-6" (2286)	7'-6" (2286)	6'-5 3/8" (1971)	5'-6 3/8" (1693)	3'-6" (1067)	Yes*
	4000 (1814)	CO	9'-8" (2947)	9'-8" (2947)	7'-6" (2286)	7'-6" (2286)	7'-6 1/8" (2304)	5'-6 3/8" (1693)	4'-0" (1219)	Yes	
	4000 (1814)	2SP	7'-8" (2337)	7'-8" (2337)	10'-2 1/8" (3102)	10'-2 1/8" (3102)	5'-7 1/8" (1705)	7'-7 7/8" (2334)	4'-0" (1219)	Yes	
	4500 (2041)	2SP	7'-8" (2337)	7'-8" (2337)	10'-8 1/16" (3252)	10'-8 1/16" (3252)	5'-7 1/8" (1705)	8'-1 7/8" (2486)	4'-0" (1219)	Yes	
	5000 (2268) ⁽⁹⁾	2SP	7'-10" (2388)	7'-10" (2388)	11'-3 3/8" (3451)	11'-3 3/8" (3451)	5'-7 1/8" (1705)	8'-9 1/8" (2685)	4'-6" (1372) ⁽⁹⁾	Yes	
	5000 AIA (2268)	2SP	7'-10 3/16" (2396)	7'-11 1/2" (2426)	11'-6 1/16" (3522)	11'-6 1/16" (3522)	5'-9 7/16" (1764)	9'-0 7/16" (2755)	4'-6" (1372) ⁽⁹⁾	Yes	

† SSP = Single Speed Side Opening / CO = Single Speed Center Opening / 2SP = Two Speed Side Opening

Visit kone.us for the latest project-specific details, CAD drawings, BIM models, CSI specifications, electrical data, reaction loads and building access requirements.

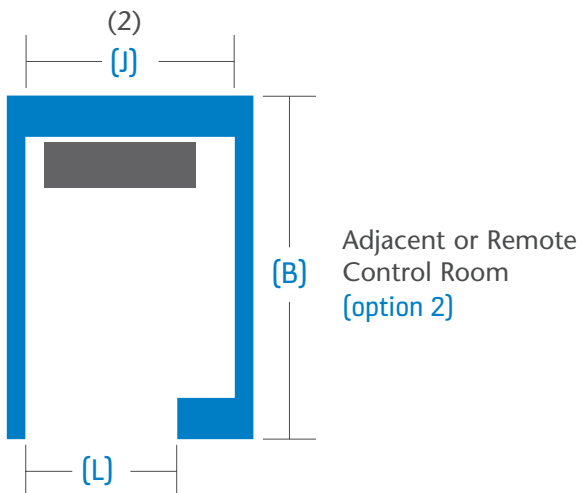
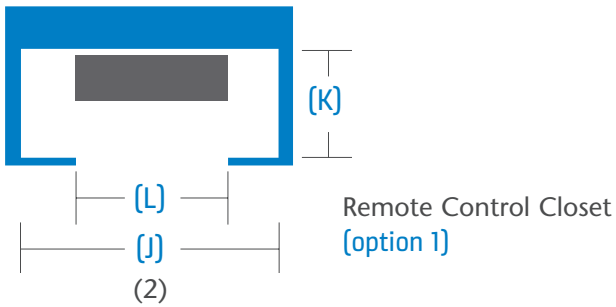
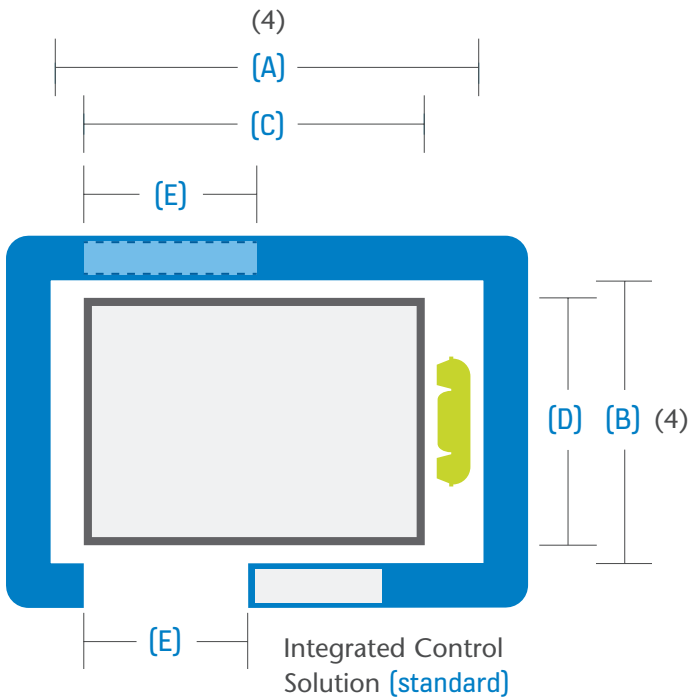
CAPACITY LBS. (kg)	CLEAR OVERHEAD (H) AND PIT DEPTH (I)					
	150 FPM (0.75 M/S)		200 FPM (1.00 M/S)		350 FPM (1.78 M/S)	
	PIT DEPTH (mm)	CLEAR OVERHEAD (mm)	PIT DEPTH (mm)	CLEAR OVERHEAD (mm)	PIT DEPTH (mm)	CLEAR OVERHEAD (mm)
2000 to 2500 (907 to 1134)	5'-0" (1524)	13'-0" (3962)	5'-0" (1524)	13'-4" (4064)	5'-6" (1676)	13'-6" (4115)
3000 to 3500 (1361 to 1588)	5'-0" (1524)	13'-0" (3962)	5'-0" (1524)	13'-4" (4064)	5'-6" (1676)	13'-6" (4115)
4000 to 5000 AIA (1814 to 2268)	5'-0" (1524)	13'-8" (4166)	5'-0" (1524)	13'-8" (4166)	5'-6" (1676)	13'-8" (4166)

CONTROL SPACE ⁽¹¹⁾	[J]	[K]	[L]	
CAPACITY LBS. (kg)	CONTROLLER SPACE	WIDTH (mm)	DEPTH (mm)	DOOR WIDTH (mm)
2000 to 5000 AIA (907 to 2268)	Remote Room	4'-1" (1245) ⁽¹¹⁾	1'-8" (508) ⁽¹¹⁾	3'-6" (1067) ⁽¹¹⁾
2000 to 5000 AIA (907 to 2268)	Adjacent or Remote Room	5'-0" (1524)	Dimension [B]	3'-0" (914) ⁽¹¹⁾

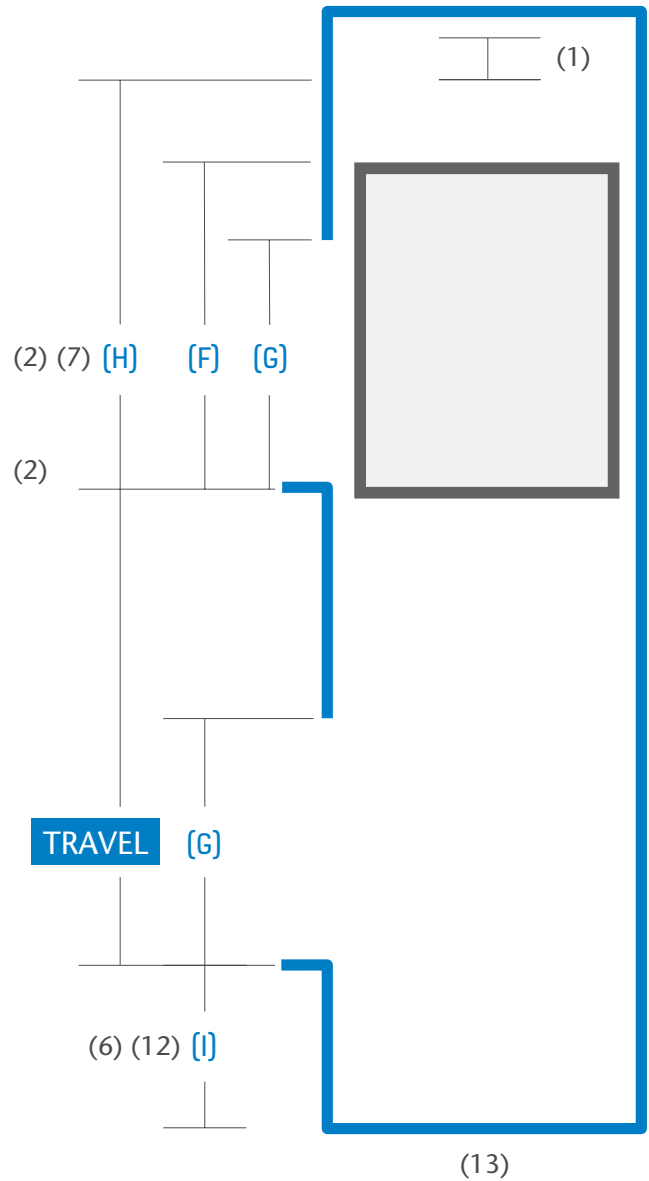
Notes

- (1) A hoist beam (by KONE) is required for installation (by others). Dimension [H] reflects clear under hoist beam.
 - (2) If an Emergency Battery Device (EBO) or KONE Destination is required, please contact your KONE Sales Professional for further detail regarding dimensions [H], [J] and [L].
 - (3) The published [A] hoistway dimension represents the optimum clear inside requirements and maybe reduced by up to 2" (51mm). However, this may result in construction inefficiencies.
 - (4) The published interior width [C] and depth [D] dimensions represent the minimum clear inside requirements without raised panels. For interior width [C] and depth [D] dimensions with raised panels please contact a KONE Sales Professional.
 - (5) 2500 LB. IBC (International Building Code) reverse opening must be diagonally opposed. For all other front and reverse opening configurations, hoistway width [A] is valid for directly opposed openings only. If diagonally opposed openings are required, please contact your KONE Sales Professional.
 - (6) The published minimum pit depth [I] dimension is based upon slide guides. For minimum pit depth [I] with roller guides please contact a KONE Sales Professional.
 - (7) All dimensions are based on an 8'-0" (2438 mm) cab with a 7'-0" (2134 mm) door. Alternate car and door heights are available, but will affect dimension [H].
 - (8) 150 fpm (.75 m/s) only available up to 85 ft. (25 m) of travel and 10 landings. 200 fpm (1.00 m/s) available up to 100 ft. (30.5 m) of travel and 12 landings.
 - (9) 4'-0" (1219 mm) door width also available.
 - (10) Stretcher accessibility based on international building code (IBC) and California Building Code specified, 24 inch by 84 inch stretcher - with 5-inch radius corners. Elevator car must utilize a side slide door with the exception of the 4000 LB. passenger shaped car. In Canada (NBCC) 2500 LB. and larger elevators with single slide doors meet Canadian stretcher rule of 2010mm x 610mm.
 - (11) If IBC (International Building Code) 2018 or ASME A17.1-2019/CSA B44-19 code is applicable, contact your local sales professional for controller space configurations.
- * 3,500 LB. Front / reverse elevators needs to have diagonal opposed doors and a wider hoistway width of 8'-9" (8' -11" if seismic) to accommodate a stretcher. Please contact a KONE Sales Professional for more information.

Plan Views



Section View



Notes, continued:

Please consult a KONE Sales Professional regarding:

- (12) Pit depths less than 5'-0" (1524 mm).
- (13) Occupied space beneath the hoistway.
- (14) Local code variations when utilizing the integrated, integral and remote closet options.

For configuration guidance or more information scan this code or visit our website to get in touch with a KONE Sales Professional:

kone.us/ms500dx

