

## SECTION 14 21 33

GEARLESS MOTOR TRACTION DRIVE MACHINE ROOMLESS (MRL) RESIDENTIAL  
ELEVATORS

## PART 1 - GENERAL

## 1.1 CONDITIONS AND REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

## 1.2 SECTION INCLUDES

*Specifier Note: Delete items below that are not included in this section.*

- A. Electric traction residential elevators.
- B. [Insert item description.]

## 1.3 RELATED SECTIONS

*Specifier Note: In this article, specify work specified in other sections that is related to work of this section.*

- A. Division 26 - Electrical: Electrical systems and components.
- B. Division 27 - Communications: Communications systems and components.
- C. Division 28 - Electronic Safety and Security: Security systems and components.

*Specifier Note: The following paragraph is a sample that may be used in this article. Add to or delete from the following as appropriate for the specific project.*

- D. Section [xxxxx] – [Section Title]: [Include brief description of work specified in another section that is related to the work of this section.]

## 1.4 SUBMITTALS

*Specifier Note: In this article, specify various types of data to be furnished by the contractor before, during, or after construction. Topics included in this article are: product data, shop drawings, samples, design data, test reports, certificates, manufacturers' instructions, manufacturers' field reports, qualification statements, and closeout submittals.*

- A. Submit under provisions of Section [01 33 00] [\_\_\_\_\_].

- B. Product Data: Provide capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:
  - 1. Car enclosures and hoistway entrances.
  - 2. Operation, control, and signal systems.
- C. Shop Drawings: Show plans, elevations, sections, and accurately-scaled details indicating service at each landing, location of machine room, machine room layout, type of wall construction, coordination with building structure, relationships with other construction, and locations of equipment and signals. Include large-scale layout of car control station. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- D. Samples: Provide samples for exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch square samples of sheet materials; and 4-inch lengths of running trim members.
- E. Operation and Maintenance Data: For elevators to include in operation and maintenance manuals.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- G. Warranty: Special warranty specified in this section.

## 1.5 QUALITY ASSURANCE

*Specifier Note: In this article, describe qualifications, regulatory requirements, certifications, field samples, mock-ups, and pre-installation meetings.*

- A. Installer Qualifications: Elevator manufacturer or manufacturer's authorized representative who is trained and approved for installation of units specified in this section.
- B. Source Limitations: Provide major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cabs, and entrances, manufactured by a single manufacturer.
- C. Regulatory Requirements: Comply with ASME A17.1. Suspension Rope, Drive Sheaves, and Battery Lowering Package complies with ASME A17.7 / CSA B44.7-2007

*Specifier Note: Delete one of two options in the following paragraph. Confirm local code requirements before selecting one of the two options.*

- D. Accessibility Requirements: Comply with Section [4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."] [407 in ICC A117.1.]

*Specifier Note: Delete the following paragraph if not required on a specific project.*

- E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to [NFPA 252] [UBC Standard 7-2] [or] [UL 10B].

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.
- B. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

## 1.7 COORDINATION

- A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to project site in time for installation.

## 1.8 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.
  - 1. Warranty Period: Two (2) years from completion date listed on Warranty Card. If Warranty Card is not received by manufacturer then two (2) years starts from delivery date of elevator from manufacturer.

## 1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide [one (1) year's] [Insert time period] full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
  - 1. Perform maintenance, including emergency callback service, during normal working hours.

*Retain subparagraph above or below. Retaining below can add appreciable cost to continuing service contract but may not add much cost for initial maintenance service.*

- 2. Include 24-hour-per-day, 7-day-per-week emergency callback service.

*Retain subparagraph below with either subparagraph above.*

- a. Response Time: Two (2) hours or less.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for electric traction elevators is based on Inclinor<sup>®</sup> LX Residential Elevators manufactured by Inclinor Company of America, 601 Gibson Boulevard, Harrisburg, PA 17104; toll-free 800-343-9007, telephone 717-939-8420, Web Site: [www.inclinor.com](http://www.inclinor.com).
- B. Substitutions will be considered under provisions of Section 01 60 00.

### 2.2 GEARLESS MOTOR TRACTION DRIVE MACHINE ROOMLESS (MRL) RESIDENTIAL ELEVATORS

- A. Gearless Motor Traction Drive Machine Roomless (MRL) Residential Elevators: Inclinor<sup>®</sup> LX Gearless Traction Motor, Machine Roomless Elevator.
1. Capacity: 950-lbs.
  2. Car Size: Custom sizes up to 15 sq ft.

*Specifier Note: Insert actual total travel distance in the following subparagraph or retain first option and delete the second one. The maximum travel distance is 50 feet.*

3. Total Travel Distance: [As indicated on the Drawings] [Insert distance in feet].
4. Floor-to-Floor Travel: [As indicated on the Drawings] [Insert distance in feet].

*Specifier Note: Select one of the options in the following subparagraph and delete the other one.*

5. Overhead Requirements: [8'-6" minimum for seven (7) foot overall high cars] [9'-6" minimum for eight (8) foot overall high cars].

*Specifier Note: Retain one option in the following subparagraph and delete the others.*

6. Stops: [Two] [Three] [Four] [Five] [Six] [Insert number].

*Specifier Note: Consult with manufacturer regarding available elevator speeds and insert number in option bracket in the following subparagraph.*

7. Speed: 40 ft/minute +/- 4.

*Specifier Note: In the following subparagraph, six inches is the minimum pit depth however the manufacturer recommends 12 inches whenever the depth is available. Revise the subparagraph to 12 inches when depth is available.*

8. Pit Depth: Eight (8) inches minimum.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

9. Power Requirements: [230 volt, 30 amp, single phase, 60 Hertz with 20 amp delay fuse] [208 volt, single phase with power boost transformer and 20 amp time delay fuse] [Insert requirements].

10. Drive System: Gearless synchronous traction motor; does not contain hydraulic or gear oil; cable traction for raising/lowering; 2-to-1 ratio with over-speed governor; double-rail chassis; emergency battery lowering; accessible and replaceable batteries.
11. Controller: Microprocessor-based with upgraded electrical technology; self-diagnostic.

B. Elevator Car:

*Specifier Note: Retain one option from the list in the following subparagraph and delete the others. Select the car configuration that suits the arrangement indicated on the Drawings or to suit layout of elevator within home.*

1. Car Configuration: [Code 1] [Code 2] [Code 3] [Code 4] [Code 5] [Code 6] [Code 1, 5] [Code 2, 4] [Code 4, 5] [Code 2, 5] [Code 1, 4] [Code 4, 6] [Code 3, 5] [Code 2, 3] [Code 2, 6] [Code 1, 3] [Code 1, 6].
2. Car Style:

*Specifier Note: Retain one subparagraph from the following four subparagraphs and delete the others.*

- a. Inclinator LX200 : Smooth hardwood veneer panels with square, flush corners; door openings on [1] [2] [3] side[s]; [Natural Oak] [Natural Birch] [Natural Cherry] [Natural Mahogany] [Natural Maple] [Natural Walnut] [Dark Oak (stain)] [Medium Oak (stain)] [Insert wood species and finish]; [finished] [unfinished] hardwood veneer floor; in-shaft, machine roomless type; automatic safety devices; [collapsible] [accordion fold gate].
  - b. Inclinator LX300 : Smooth hardwood center panels with crown, chair, baseboard and picture molding; door openings on [1] [2] [3] side[s]; [Natural Oak] [Natural Birch] [Natural Cherry] [Natural Mahogany] [Natural Maple] [Natural Walnut] [Dark Oak (stain)] [Medium Oak (stain)] [Insert wood species and finish]; [factory [stained] [painted]] [field [stained] [painted]]; [finished] [unfinished] hardwood veneer floor; in-shaft, machine roomless type; automatic safety devices; [collapsible] [accordion fold gate].
  - c. Inclinator LX400 : Solid wood with hardwood veneer [raised] [recessed] center panels; [2-over-2] [1-over-1] panel configuration; door openings on [1] [2] [3] side[s]; [Natural Oak] [Natural Birch] [Natural Cherry] [Natural Mahogany] [Natural Maple] [Natural Walnut] [Dark Oak (stain)] [Medium Oak (stain)] [Insert wood species and finish]; [factory [stained] [painted]] [field [stained] [painted]]; [finished] [unfinished] hardwood veneer floor; in-shaft, machine roomless type; automatic safety devices; [collapsible] [accordion fold gate].
3. Car Size:
    - a. Width of North (Rail) and South Walls: [Insert dimension] feet.
    - b. Width of East and West Walls: [Insert dimension] feet.
    - c. Height: [Seven] [Eight] feet overall.
  4. Wall Finish: [Semi-gloss] [Unfinished] [Stain as selected] [Paint as selected].
  5. Floor: [Laminated [Cherry] [Birch] [Natural Oak] [Walnut] [Maple].] [Unfinished Oak with [polyurethane] [stain] finish.] [Owner-supplied tongue and groove flooring; [parallel to north wall] [perpendicular to north wall].]

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

6. Handrails: [Wood to match car finish] [Stainless steel - round] [Brass - round] [Bronze - round] [Oil-rubbed bronze - round].

*Specifier Note: Specify locations of handrails on open walls in the following subparagraph. Handrails must be located on open walls. Coordinate locations with door openings.*

7. Handrail Locations: [Insert location of walls to receive handrails].  
8. Lights and Trim:

*Specifier Note: In the following subparagraph, the first option is the manufacturer's standard downlight and the others are optional. Retain only that option which is to be used on the project.*

- a. Standard Six Inch Downlight with Glass Lens: [Brass ring] [White ring] [Polished stainless steel] [Durantic Ring] [Bronze ring].

*Specifier Note: The following subparagraph contains optional downlights that may be specified. Delete either the following or previous subparagraph and retain the other.*

- b. Downlights Flush With Dome: [2" x 9-1/2" x 9-1/2" surface mounted light] [Six inch downlight with black cove baffle and white trim ring.]  
9. Gates and Openers:

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

- a. Collapsible Gate: Metal scissor-type gate with [silver] [bronze] [oil-rubbed bronze] [brass] [duranotic] finish.  
b. Accordion Fold Gate: Combination of solid and vision panels fabricated from the following materials and finishes:

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

- 1) Hardwood: [Walnut] [Teak] [Mahogany] [Cherry] [Birch] [Oak] [Maple] finish.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

- 2) Vinyl Laminate: [Maple] [Dark Oak] [Light Oak] [White] [Walnut] [Birch] [Cherry] [Mahogany] finish.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

- 3) Acrylic for Vision Panels: [Clear] [Bronze tint].

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

- 4) Metal Finish: [Silver] [Bronze] [Brass] [White] [Beige].

*Specifier Note: Select either of the options in the following subparagraph and delete the other.*

- c. Opener: [Door auto opener] [Accordion gate auto opener].  
d. Gate Safety Bar: Collapsible type.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

10. Dome Ceiling: [White laminate] [Natural Oak] [Natural Birch] [Natural Cherry] [Natural Mahogany] [Natural Walnut] [Dark Oak (stain)] [Medium Oak (stain)].

*Specifier Note: Select one of the options in each of the bracketed areas of the following subparagraph and delete the others.*

11. Car Operating Stations: [Two] [Three] [Four] [Five] [Six] landing type; [Polished Brass] [Brushed Brass] [Polished Stainless Steel] [Brushed Stainless Steel] [Oil-Rubbed Bronze] [Bronze] [Duranotic] finish. Provide top and bottom end caps and buttons in polished stainless steel. Select plate configurations based on the elevator's use requirements.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

12. Hall Operating Station: Similar construction to car operating station but with a single button; [Polished Brass] [Brushed Brass] [Polished Stainless Steel] [Brushed Stainless Steel] [Oil-Rubbed Bronze] [Bronze] [Duranotic] finish.

*Specifier Note: Insert the number of locks required and indicate whether they are left or right handed.*

13. Locks: Item EM-7; [Insert quantity and hand]; renders call station inoperable.

*Specifier Note: Select one of the options in the following subparagraph and delete the others.*

14. Telephone Box: Manufacturer's standard type in [Brushed Stainless Steel] [Brushed Brass] [Brushed Bronze]; installed by dealer only.

*Specifier Note: Select either option in the following subparagraph and delete the other one.*

15. Accessibility Accessories: [Tag] [Handicap label].

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Confirm that hoistway is constructed in accordance with ASME 17.1 and applicable local codes.
- B. Verify that the temperature in the hoistway is designed to be maintained between 60 degrees F and 110 degrees F.
- C. Confirm that hoistway shaft and openings in walls are of correct size and location and are within acceptable tolerances.
- D. Verify availability and characteristics of electrical power.
- E. Do not begin installation until preliminary work including hoistway and landings are complete and ready for installation of elevator components.

### 3.2 INSTALLATION

- A. Install in accordance with ASME A17.1 and manufacturer's written instructions.
- B. Install elevator equipment and car enclosure. Connect to building utilities.
- C. Install double-rail chassis in hoistway. Accurately align chassis for smooth operation. Adjust as required.
- D. Coordinate installation of hoistway doors, sills, frames, and other built-in construction with construction of walls enclosing hoistway. Do not begin construction of surrounding walls until installation of elevator equipment in hoistway is complete.
- E. Adjust equipment for smooth and quiet operation.

### 3.3 FIELD QUALITY CONTROL

- A. Perform tests in accordance with ASME A17.2.1.
- B. Provide [two] [Insert number] weeks written notification to interested parties prior to scheduled testing.
- C. Provide instruments as required to perform scheduled tests.

### 3.4 FIELD SERVICES

- A. Perform tests as required by authorities having jurisdiction. Perform tests in the presence of the [Architect] [Contractor] [Owner].
- B. Provide test reports and approval certificates issued by authorities having jurisdiction.

### 3.5 CLEANING AND PROTECTION

- A. Remove protective coverings from finished surfaces prior to turning elevator over to Owner.
- B. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer.
- C. Protect installed elevator components until acceptance by Owner.
- D. Touch-up, repair or replace damaged components prior to acceptance of completed installation by Owner.

### END OF SECTION

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