



**Policy Title: Directive 14-1 Elevators**

**Responsible Office: Design & Construction**

**Last Revised Date: November 2019**

### **Summary**

This Directive provides requirements for new and existing renovated elevators on Fund projects.

### **Overview**

Projects with elevators must be designed with awareness of the code complexity associated with elevator work. This Directive doesn't describe a path to code compliance but has questions that may help the Consultant provide a code-compliant design.

### **Responsibility**

The Consultant is responsible for complying with this Directive, Campus standards and the codes listed in *Directive [1B-1 Building Codes](#)*. For Campus standards, comply with *Directive [1C-10 Coordination with Individual Campus Standards](#)*. The Campus will provide any existing elevator drawings, submittals, elevator service contracts, service logs and other information that it may have to the Consultant. The Consultant will consult with the current elevator service contract representatives during the design of the elevator. The Consultant will coordinate selection of elevator finishes, keying, security and access control with the Campus and incorporate Campus preferences into the construction documents. Consultant should have an Elevator Designer as an approved subconsultant if the Consultant lacks in-house elevator expertise. The Elevator Designer shall have experience and a working knowledge of all current codes.

### **Procedures**

- I. General
  - A. Comply with all applicable codes and standards including:
    - 1) New York State Uniform Fire Prevention and Building Code
    - 2) American Society of Mechanical Engineers (ASME) A17.1- Safety Code for Elevators and Escalators and any other applicable codes. Special considerations should be given for elevator work in New York City. The Consultant will provide a review of differences between City and State elevator requirements and make recommendations to the Campus and the Fund for optimal compliance and reconciliation of conflicts.
    - 3) See *Directive [1B-1 Building Codes](#)* for code compliance requirements and applicable versions of references standards mentioned in this Directive.
  - B. Elevator and components shall be manufactured for use in the United States and provided by US-based sources unless otherwise approved by the Fund and the Campus during the Design Manual review.
  - C. Provide options for colors and materials exposed to view. See *Directive [1C-3 Material and Color Selections](#)*, for guidance on color selections.



- D. For elevator communications systems, coordinate with Campus telecommunications staff regarding connections to the Campus system. See [Directive 27-1 Communication Systems](#).
- E. Independent Testing Agency - As required to provide existing condition documentation required to support the elevator renovation design, the Consultant shall hire an independent ASME Certified Elevator Inspector to perform field inspection and testing of elevator. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to third party testing efforts required in this Directive may be provided through extra compensation when approved by the Fund. See [Directive 1C-4 Extra Compensation Authorization](#) for more requirements.
- F. Identify sole and single sources in the Design Manual submission and comply with [Directive 1C-2 Specification of Materials](#). Sole and single sources should be limited to the components required for integration into the existing Campus monitoring and control systems. For full elevator replacement, the Consultant shall engage with at least three manufacturers to determine and specify the appropriate equivalent systems that fit within the existing physical constraints.

## II. New Elevators

### A. Design Considerations

- 1) During the Concept Phase, coordinate the location and number of new elevators by providing a traffic analysis to determine the number and size of the elevators to adequately serve the building.
  - a) In the analysis, describe the criteria for determining the number and locations for the elevator or elevators.
  - b) Using the code analysis, determine if the elevator is part of the accessible means of egress and confirm that it aligns with the optimal evacuation route.
  - c) If the building elevator will be used as part of the Campus' accessible route, consider whether the portion of the Campus accessible route in the building must be independent from building circulation and exiting paths.
  - d) Make recommendations for the type of elevator: traction, hydraulic, machine room less, or other, with supporting documentation for the choice.
- 2) Explain the design path of travel / approach, locations served, and access controls (by key or card), if any, on the route to the elevator and/or in the cab, as well as proposed security provisions. Determine if the Campus wants security cameras to monitor the elevator cab, lobbies or other access points.

- 3) Unless otherwise approved by the Campus and the Fund, the elevator must serve mechanical levels / mezzanines, interstitial space, penthouses and other levels where elevator service may not be required by Code.
  - a) Determine the elevator size and capacity.
    - 1) Will the elevator be able to fit a stretcher?
    - 2) Will the elevator fit the largest item (FFE) that the Campus may need to move into the building? To avoid overdesign of the elevator, for extra-large items that move infrequently, is there a reasonable alternative delivery path?
    - 3) What is the maximum occupancy and weight capacity of the cab?
  - b) Determine the number of elevators proposed based on building occupants per floor, location of elevator and the number of stories for the building.
    - 1) What is the estimated wait time?
    - 2) Does the building's use require a separate service elevator?
    - 3) For animal transport and other programs requiring secure travel paths, consider having a dedicated elevator.
    - 4) For buildings housing core Campus services, consider having two elevators where one could remain in services while the other is out of service for maintenance or improvements.
  - c) Consider the service requirements for the elevator and how service activities will fit with Campus operations.
    - 1) Which floor level is the most likely location for access to the top of the cab and does the lobby need any enhancement to support service activities?
    - 2) Does the elevator require a machine room?
      - i. Where does the machine room need to be located in relation to the elevator?
      - ii. Machine rooms should be properly ventilated to maintain a room temperature required for equipment operation. Supplement with heating and cooling to maintain the proper room temperature.
    - 3) Coordinate the elevator shaft size, pit depth, hoist beam, and other requirements with all the manufacturers listed in the specifications. Shaft size and other work not installed by the

elevator installer should be designed to accommodate any manufacturers listed.

- d) Soil Borings: if required for the new elevator, obtain soil borings as close to the proposed elevator shaft as possible. Locate the ground water level at or near the proposed shaft.
- e) Consider additional code requirements that exist for new construction, such as seismic zone must be considered in the design of cab rails and shafts.

### III. Renovation of Existing Elevators

- A. Prior to the Schematic submission, perform the following and include the appropriate scope requirements in the Schematic design:
  - 1) The existing elevators and access paths must be examined, and an assessment made as to whether they are part of an accessible route.
    - a) Discuss if the work impacts the ADA accessibility of the building, describe the phasing that mitigates the impact to the Campus in the Schematic submission.
    - b) The final bid documents will include all Campus requirements regarding phasing.
    - c) Consider having laser scans provided for all shafts.
  - 2) Consultant designer/engineer is responsible to conduct a thorough examination of the existing elevator(s). A checklist is attached to aid this effort.
    - a) All code deficiencies must be identified. For the renovated elevator to be accepted, it must be refurbished from top to bottom.
    - b) Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to the field survey and other third-party investigative efforts required in this Directive may be provided through extra compensation when approved by the Fund. See [Directive 1C-4 Extra Compensation Authorization](#) for more requirements.
    - c) If there is no evidence of regular inspections of the elevator, it is incumbent on the Consultant to call the Fund Coordinator and schedule a meeting with the Campus to discuss ramifications.
  - 3) The Consultant must confirm the fire ratings of the existing construction by inspecting shaft walls, walls enclosing the machine room, and other partitions. During the inspection, identify and document any conditions that compromise code required ratings.

- 4) Determine if there are any issues of existing hydraulic elevators leaking oil from the cylinder during the elevator inspection. Document construction access paths and staging areas for drilling that may be required for cylinder replacement. Note impact to Campus operations and constraints that contractor will have when utilizing such paths and staging areas. See [Directive 1D-4 Construction Site Requirements](#) for construction staging and access policies.
- 5) Asbestos and Hazardous Material Testing
  - a) Coordinate sampling with the Existing Investigation specified in this Directive to identify and test presumed asbestos materials that may be concealed by existing construction or accessible from the top of the cab.
  - b) Identify and test presumed asbestos materials in the shaft assembly and adjacent interior, such as sprayed-on fire-proofing, thermal insulation, etc. that may be disturbed by new work.
  - c) Refer to [Directive 1D-6, Asbestos Abatement](#), for asbestos abatement policy.
  - d) Perform sampling and testing for lead if painted surfaces or other presumed lead containing materials will be distributed during the work.
  - e) Refer to [Directive 1D-5, Lead Remediation](#), for lead remediation policy.
- B. Prior to the Construction Document submission, perform the following and include the appropriate scope requirements in the documents.
  - 1) For existing hydraulic elevators requiring a piston, a PVC type cylinder encasement shall be supplied.
    - a) The PVC jacket shall create a means of environmental protection in the event of a hydraulic oil leak. The PVC jacket shall be continuous and be pressure tested prior to the cylinder being placed into service. The Consultant must account for construction tolerances between the PVC jacket and steel casing. Replacement of steel casing may be required.
    - b) Cleaning debris from an existing steel casing by means of vacuum has been proven unsuccessful when ground water is encountered. The rapid change in water elevation has caused surrounding soil to migrate back into the steel casing.
    - c) Drilling replacement casings shall be performed by an experienced elevator casing drilling contractor, not water well drillers.
  - 2) Cab Renovation – cab refurbishment vs. cab replacement: It can be more economical to Replace the cab rather than rehab it. Compare costs and lead times of each approach. Spring arm type door closure requires less

maintenance than cable type and is preferred by the Fund. Confirm with the Campus that they agree with this approach.

#### IV. Coordination with Other Design Requirements Applicable to All Elevator Work

A. Review the following coordination questions and confirm the Construction Documents have the appropriate answers as applicable to the scope of work.

- 1) Is an independent ventilation or air-conditioning system required in the machine room?
- 2) Is hoistway venting required and is it properly integrated into the fire alarm system?
- 3) Should there be provisions to control unintended car movement or ascending car overspeed?
- 4) Are the elevator shaft and mechanical spaces free of mechanical systems and plumbing systems except where permitted by code?
- 5) Is the elevator hoistway and elevator machine room required to be equipped with a smoke control pressurization system? If so:
  - a) Has the elevator smoke control system been designed to maintain the minimum positive pressurization required for the hoistway?
  - b) Are the elevator smoke control pressurization system fans independent and properly sized?
  - c) Have the smoke control pressurization system fans and ductwork been provided with the required fire rated resistance protection?
  - d) Has the elevator smoke control pressurization system been placed on standby power?
  - e) Has the elevator smoke control pressurization system been designed to activate by the building fire alarm system or associated lobby smoke detector?
  - f) Does a heat or smoke detector located in the elevator machine room serving a pressurized hoistway initiate the room to become positively pressurized?
- 6) Should there be standby power provided for the elevator, related HVAC, plumbing and fire protection equipment? Generator size may impact construction cost, and alternative means of providing power or diversity in generator loads should be explored.
- 7) Is an elevator shunt trip required where the elevator controls are located in sprinklered spaces?
- 8) Are the elevator pits required to be equipped with a drain or sump pump?
  - a) Does the existing elevator hoistway contain a sump pump pit with a grate?
  - b) Does the drain or sump pump discharge into the sanitary system through an indirect waste connection?
  - c) Is the sump pump an oil sensing type or does the drain go to oil separator for a hydraulic elevator?

- d) Has the sump pump been properly sized?
  - e) How will the emergency communication system be connected to the existing Campus systems?
  - f) Will the elevators be needed by the Campus prior to beneficial occupancy of the project and is an elevator operator required during the Campus use?
  - g) Review Section 01 54 13 Use of Elevator(s) for Construction in the Fund's General Requirements for additional considerations.
  - h) Review other architectural, mechanical, electrical and plumbing coordination Issues as required by the scope.
- B. Discuss and include requirements for service contracts and warranty provisions. Obtain Campus approval for data connections to external parties for the transfer of data, monitoring of real time conditions, or remote control of any operations.
- V. Specifications
- A. Comply with Directives [1C-2 Specification of Materials](#) and [27-1 Communication Systems](#).
- B. Specifications Part 1
- 1) Consider linking approval of elevator submittals from other sections impacting critical shaft dimensions.
  - 2) Specify coordination conferences with the Contractor for pre-submittal, pre-installation, pre-acceptance, post-occupancy adjustments, and other coordination interface required to facilitate the campus' acceptance of the elevator. The elevator installer, elevator manufacturer's technical representative, Contractor, elevator designer, Consultant, Campus and Fund shall attend the conferences.
  - 3) Reference the Fund's General Requirement Section 01 54 13 Use of Elevator(s) for Construction.
  - 4) Do not specify data connections to external parties unless approved by the Campus.
- C. Specification Part 2: confirm that the installed elevators will include all optional items that may be required by the Campus.
- D. Specifications Part 3
- 1) Specify the required maintenance work that will occur during the one year guarantee period.
  - 2) Specify the response time for Campus requests, emergencies and other situations that may occur during the guarantee period.

- 3) Require that the firm doing the maintenance sign in and out with a Campus representative.
- 4) Prior to the end of the guarantee period, specify a joint inspection of the elevator (s) with the Contractor, Campus, elevator installer and the Campus maintenance contractor who will assume responsibility for the elevator maintenance at the end of the guarantee period.
- 5) In the specifications the Consultant must include information regarding existing maintenance contracts being administrated by the Campus. Obtain a copy of the existing Campus Service Agreement and include the same provisions for the project elevators for the full construction period plus one year beyond acceptance. The Campus must delete the elevators from their existing service agreement beginning on the date of the executed construction contract.
- 6) The Consultant should review the need for diagnostic tools related to field service microprocessor documentation and personal training with the Campus.
- 7) Include all warranty extensions specified in Fund General Requirement Section 01 78 36 Warranties.

#### VI. Drawings

- A. Show all dimensions required by Code and reference standards and coordinate dimensions between all drawings. Shaft size should be dimensioned to support the largest elevator among the three named manufacturers in the specifications.
- B. Show elevator machine(s), controllers and other elevator devices with proper space for maintenance.
- C. Show related MEP equipment with access for maintenance. Show the location of the controller for oil minder pump in plan and confirm the location with the campus.



**Examination of Existing Elevators Checklist****1) Machine Room Equipment**

- a) Controllers
- b) Selectors
- c) Hoist Machines
- d) Motor Generators
- e) Governors
- f) Machine Room Lighting
- g) Machine Room Ventilation
- h) Disconnect Switches
- i) Smoke Holes
- j) Access Doors
- k) Receptacles
- l) Telephone and call routing
- m) Sprinklered
- n) Any presumed ACM? Lead paint?

**2) Hoistway Equipment**

- a) Hoist Ropes
- b) Hoistway Limits
- c) Top of Car Operating Station
- d) Guide Shoes
- e) Wiring, Conduit and Traveling Cables
- f) Car Door Operator
- g) Hoistway Door Equipment
- h) Floor Numbers

**3) Pit and Pit Equipment**

- a) Light Switch
- b) GFI power outlet
- c) Pit Stop Switch
- d) Ladder
- e) Covered Sump Pit?
- f) Drained or pump? To sanitary?
- g) Bottom sidewall sprinkler head?

**4) Cab Enclosures**

- a) Cabs
- b) Cab Flooring
- c) Car Sills
- d) Car Pushbutton Stations
- e) Car Position Indicators
- f) Door Protection
- g) Traffic Director Station
- h) Communication
- i) Emergency Lighting
- j) Ventilation

**5) Operation**

- a) Control:
- b) Machine:
- c) Power Supply:
- d) Floors Served:

**6) Car & Hoistway Doors**

- a) Door Equipment:
- b) Clear Opening Door
- c) Size: Self-Leveling:
- d) Platform Interior Net Size:

**7) Equipped for Disabled****8) Equipped for Fireman's Recall**

- a) Equipped for 24-Hr communication:

**9) Major Renovation**

- a) Presently Maintained by:
- b) Maintenance Overview:
- c) Last Five-Year Safety Test:
- d) Manufactured/Installed: Year Installed:

**10) Evaluation of Existing Equipment & Recommendations**

- a) Machine Room Equipment
- b) Controllers
- c) Selectors
- d) Hoist Machines
- e) Motor Generators
- f) Governors
- g) Machine Room Lighting
- h) Machine Room Ventilation
- i) Disconnect Switches
- j) Smoke Holes
- k) Access Doors
- l) Receptacles
- m) Telephone
- n) Sprinklered
- o) Any presumed ACM? Lead paint?

**11) Elevator Lobbies, Hoistway Doors and Frames**

- a) Floor Markings
- b) Hall Pushbutton Stations
- c) Hall Position Indicators
- d) Hall Lanterns
- e) ACM or lead based paint?

**12) Fire Emergency Service**

- a) Describe what has been provided.
- b) It is functional and in compliance?
- c) When was fire recall added?
- d) Location of smoke detectors?

**13) Emergency power available for controlled lowering of cab/shut down of elevator?**

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