

SECTION 08346 – RADIATION SHIELDED SWING DOOR



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PART 1 - GENERAL

Furnish all labor, materials, tools, equipment and services for all linear accelerator room doors as indicated, in accordance with provisions of contract documents.

1.1 ACCEPTABLE MANUFACTURERS

Swinging door shall be manufactured by, and all accessories and parts supplied by NELCO or approved equal manufacturer regularly engaged in the manufacture of these items and with at least ten (10) years experience in the production and installation of radiation shielding doors.

1.2 SUBMITTALS

- A. In accordance with conditions of the contract and Division I, submit six (6) copies of shop drawings for each type of swinging door unit, including typical unit elevations, sections and details of typical composite members.
- B. Submit six (6) copies of door operating instructions and manufacturers warranty. Operator shall be warranted against defects for a period of not less than one (1) year and door systems shall be warranted against defects for a period of not less than one (1) year.

1.3 DESIGN

- A. **Frame Construction:** This design offers a full 48" clear opening when door is in 90-degree, full open position. Normally, while in this position the door thickness would protrude into clear jamb opening. The advantages to the offset frame are as follows:
 - A linear accelerator can be brought into the vault after the door is installed. This allows more flexibility in scheduling the installation of the linear accelerator. Traditionally, the neutron shielded doors are installed after the accelerator is brought into the vault. This has caused problems not only in scheduling the installation, but in testing the accelerator. NELCO's exclusive recessed door frame eliminates these problems by allowing free and shielded passage at any time.
 - During an equipment change-out, the door does not have to be removed to allow the accelerator to pass through the opening. This avoids additional field trips for the door manufacturer and any major interference within the therapy department.
 - When in the "open" position, door is flush with the offset frame.
- B. **Door Construction:** Door and frame to withstand all loads without deflection that might inhibit operation or impair radiation protection. Design radiation shielding to provide equivalent thickness in any straight line with no gaps and minimum overlap of 1". Exceptions: Maximum of 1/2" gap under bottom of door. Detail frames and sub-frames for welded concrete anchorage.

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- B. Operation: The door is automatically opened or closed by pushing one of two switches located on the interior and exterior walls. In the event of a power failure, the operator motor disengages and the door is Free Egress and can be manually opened. Room use should be discontinued until proper operation is regained.

1.4 PRODUCT HANDLING

Door frame is shipped separate from balance of the order. Door and operator are shipped together and stretch-wrapped around all four sides. Contractor will remove door frame with a fork-lift only after careful inspection to confirm the frame has not been damaged during delivery. Damaged frames must be returned on delivering truck.

1.5 WARRANTY

New England Lead Burning Co. Inc. (NELCO), subject to ordinary operation, warranties this door and its hardware against defects in workmanship and materials. We will repair this product or replace parts free of charge for one (1) year from the date of invoice. We do not guarantee against defects due to the failure to exercise normal preventive maintenance, nor do we guarantee against the consequence of use for which our products were not designed.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Steel sheet and strip: commercial quality carbon steel, ASTM A568
- A. Structural Steel: Bent steel frame, door structure, and attachment members designed and sized to specific conditions. Fabricate rigid, neat in appearance and free from defects. Fit and assemble in shop, wherever practical. Assure proper assembly at site. Weld joints continuously, dress exposed joints smooth and flush. Clean off all mill scale and foreign materials and shop prime.
 - Steel sheet and strip: commercial quality carbon steel, ASTM A568.
 - Steel bars and plates: ASTM A36.
 - Roll formed steel members: ASTM A36.
- D. Inserts, bolts and fasteners: Manufacturer's standard units
- C. Primer: rust-inhibiting paint suitable as base for specified finish paints
- E. Lead sheet: fed. Spec. QQL-201-f, grade C free from imperfections affecting performance, thickness as indicated
- F. Polyethylene: 5% boron content, manufactured specifically for neutron shielding

2.2 DOOR AND FRAME

- A. Doors: Steel bar or plate perimeter frame with 1/4" minimum thickness steel faces. Optional wood or plastic laminate veneer type as specified by architect. Door shall have required lead and borated polyethylene thickness, as specified by physicist of record.
- B. Heavy Duty Door Frames: Minimum 1/4" thick steel sheet, type A36. Weld in concrete anchors and hinge reinforcing. 1 1/2" deep 1/4" lead lined sill welded to bottom of side jambs.
- C. Hinges: One pair of NELCO N series Heavy Duty weld-on type adjustable ball bearing hinges per door.
- D. Pulls: One each side, cast aluminum US26D finish.

2.3 DOOR CLOSER / OPERATOR

- A. Work included: Power door operator recommended for ease of operation and safety. Electric or pneumatic may be used. Door weight must be considered for correct power operator. Product literature describing the recommended operator shall be submitted to architect. All operators shall be free egress in the event of power failure.
- B. Work not included: Electrical supply and conduits.

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2.5 OPTIONAL SAFETY FEATURES

- A. Presence Sensor: This device shall detect any object which passes through the presence area and send a signal to stop the door.

2.6 FABRICATION

Fabricate rigid, neat in appearance and free from defects. Fit and assemble in shop, wherever practical. Assure proper assembly at site. Weld joints continuously, dress exposed joints smooth and flush. Prepare for finish hardware that is not shop installed. Clean off all mill scale and foreign materials and shop prime.

PART 3 - EXECUTION

3.1 DELIVERY – NELCO

The door frame will be delivered within 3 weeks, upon receipt of approved drawings and purchase order. The door and operator will be delivered 4 weeks of approved drawings and purchase order.

3.2 PREPARED SITE CONDITIONS – GENERAL CONTRACTOR

Concrete wall surface shall be stripped of concrete form work and be free of any protruding concrete ties, rebar or protrusions which might interfere with door placement. Immediate area should be accessible and clear of materials and equipment. Temporary Facilities are to be provided by the General Contractor.

3.3 PREPARATION – NELCO

Examine structure, substrates and conditions under which work is to be installed for conditions detrimental to correct and timely completion. Installation constitutes acceptance of responsibility for performance.

3.4 INSTALLATION – GENERAL CONTRACTOR

Frame manufactured and furnished by NELCO, installed by general contractor. Frames must be installed plumb within 1/8" over vertical height and square to insure proper door balance and operation. Immediately after installation, sand smooth rusted or damaged areas of prime coat. Connect interlock switch locations to open conduit and run conduit through formwork to stub-out point.

3.5 INSTALLATION – NELCO

- A. Set door leaf, door hinges, and hardware as detailed on approved shop drawings. Touch up prime coat with compatible primer. Leave smooth for finish painting.
- B. Electric door operator to be installed and maintained by trained NELCO personnel or a qualified local area door operator contractor.
- C. Frame mounted equipment interlock switches supplied and installed by NELCO to electrical connection by others.
- D. No attempts should be made at adjusting door operating speed except by authorized operator technicians. All set speeds will meet ANSI standards. (Ref. ANSI / BHMA A156.10-1991).

3.6 OPERATIONS

- A. Any attempt to operate at a faster speed will cause premature wear and damage to the operator and void any warranty. NELCO will not be liable for injuries to any persons, when the door is operating faster than ANSI standard speed.
- B. No attempt should ever be made to disengage frame mounted interlock switches or any safety feature, as this could present a serious health risk.
- C. Objects should be kept clear of door operation area. No objects should ever be placed to keep door in the closed or open position restricting free movement.