

NC STATE University Construction Guidelines

08100 Doors

Part 1: General

Part 2: Design Guidelines

- 2.01 Exterior Doors: Main and secondary building entrance doors shall be heavy-duty commercial aluminum storefront with steel reinforcements for all hardware: closers, locks, exit devices, hinges and power operators. Exterior doors in historic buildings should match the building architecture. Aluminum frames shall be steel reinforced for hardware: butt hinges, continuous hinges and strikes.

Exterior service doors shall be hollow metal: 16-gauge minimum face panel, 14 gauge minimum frame.

The minimum clear opening size shall be 3'0" x 7'0"

Exterior doors swinging in pairs are not recommended. Where a double door size opening is required (for equipment and furniture), the use of a removable center mullion is recommended.

On all main entrance doors, including air lock doors, an automatic door opener shall be provided. Switches shall be protected from the weather.

Floor mounted closers shall not be used.

- 2.02 Interior Doors: The minimum clear opening size shall be 3' 0" x 7' 0". The minimum door thickness shall be 1¾". Wood doors are to be flush face, solid lumber, wood stave core doors, AWI specification symbol SLC-5.

Mineral core doors may be used only where higher fire rating for door is required. These doors shall be reinforced for hardware: power operators, locks, closers, exit devices, and hinges.

Finishes: Transparent finished wood doors shall be factory finished to meet or exceed AWI System #5 performance specifications.

Interior frames: Frames shall be minimum 16-gauge steel. Each frame shall receive anchors. Provide a minimum of three anchors per jamb up to 7' 6", four anchors over 7' 6" to 8' 0", and one anchor per every two feet over 8' 0".

Finish: For renovations, new doors and frames should match existing doors and frames in the adjacent area. Any exception shall require approval by the NCSU project manager.

- 2.03 Door Hardware: See Section 08700 for hardware information.

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08500 Windows

Part 1: General

- 1.01 Windows shall be commercial-grade aluminum windows. The frames shall be a minimum of .62-inch thick aluminum. Fasteners shall be non-corrosive stainless steel. All fasteners shall be concealed. All glass shall be insulated type, double paned. Finish shall be clear anodized or a white fluoropolymer finish with a 15-year guarantee such as Kynar 500. Field painting is unacceptable.
- 1.02 Window stools shall be of aluminum, stone (such as slate) or solid polymers. Wood window stools may be considered in certain instances, but should be treated/coated to resist moisture. Plastic laminate, or concrete masonry units are unacceptable.

Window assembly shall be warranted against defects in material and workmanship for a one-year period from the acceptance of the building.
- 1.03 In historic buildings, replacement windows should match the architecture of the building. Aluminum or vinyl-clad windows should be considered.
- 1.04 Windows should be placed to maximize views to exterior and natural light without increasing heat load.
- 1.05 Operable windows should be considered in normally occupied non-laboratory spaces (offices, classrooms, etc.).

08700 Building Hardware

Part 1: General

- 1.01 Quality Control/Submittals: All building hardware schedules shall be prepared by an AHC certified hardware consultant. The designer shall prepare and submit for University approval, a folio of all hardware items proposed, noting those that vary from those listed in this section.
- 1.02 Finishes: All new buildings shall have US26D finish. All additions and renovation projects shall use finishes to match predominant existing finish.
- 1.03 Keying: NC STATE utilizes the Best Lock Company interchangeable core system for grandmaster keying. All lock-sets and lock cylinders shall accept interchangeable Best cores with no exceptions. Hardware shall be initially shipped with temporary construction cores. Final cores will be shipped to the University Lock Shop. The General Contractor will remove the construction cores upon final keying of the building prior to acceptance.
- 1.04 During construction document development, the designer will meet with the University user group, the FP&D project manager, the Construction Manager, and the University Lock Shop to develop the keying requirements for the building/project. During construction, the designer will co-ordinate with the Construction Manager to re-verify the keying requirements with the user group prior to submitting the keying order to the Lock Shop.

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Part 2: Design Guidelines

- 2.01 Panic Hardware: Device shall be rim or mullion type. Vertical rod type shall be non-concealed and to be used in double doors where rim or mullion-type cannot be used. Device shall be through-bolted to door. Devices shall be by Von Duprin series 99 or 33(only).
- 2.02 Locksets: Heavy-duty, mortise type by Schlage, Best, or Corbin-Russwin. Provide lever handle type, with lever return back to door surface.
- 2.03 Closers: Closers shall have adjustments for back check closing speed, latch speed, and spring power. Bracket types shall be specified. Closer shall be mounted in inverted overhead position or parallel arm position. Concealed or semi-concealed closers shall not be used. Closers shall be LCN Warehouse 4010 series. Floor closers shall not be used except in approved exterior locations.
- 2.04 Electric Automatic Door Openers: Preferred power door operator for designated swing doors is the LCN Electric Auto-Equalizer, a limited energy unit manufactured by LCN Closers. Provide the following:
- a) Units shall meet *NC Building Code*, volume 1-C, and ADAAG manual force requirements of 5 lbs. Full closing force shall be provided when the power or assist cycle ends.
 - b) All power operated systems shall include compatibility with keypads or card readers and have built-in supply for actuators and peripherals, power actuators, and electric latch retraction or magnetic locks.
 - c) All units shall be covered by a 2-year warranty. Warranty shall begin after installation and not upon delivery.
 - d) All units should be inspected by the factory representative for proper installation and function after installation.
 - e) Parts replacement and service shall be provided by the factory representative while the unit is under warranty, service on units shall be provided by factory representative for the life of unit.

Door Closers: LCN 4040.

Wall Plate Actuators: For exterior applications, actuators shall be hardwired low voltage and shall have a stainless steel 4 1/2" round plate with engraved blue filled handicap symbol. Where applications require a surface-mounted actuator, the system shall include surface mounting box made of heavy industrial-grade components providing weather-resistant installation. Preferred models are by LCN 958 and LCN 956.

Electric Strikes: In new door and/or frames receiving automatic door operators, install an electric strike for future installation of card a reader. The electric strike shall be by Von Duprin or Folger Adams.

- 2.05 Hinges: All doors shall have minimum of 3 hinges. Doors over 90 inches high shall have one additional hinge for each additional 30" in height. Exterior doors, corridor doors, doors over 36 inches wide, and all doors with closers shall have ball bearing hinges.

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2.06 Push/Pulls: push and pull must be through-bolted to each other.

2.07 Stops: Overhead stops must be coordinated to stop door simultaneously with check mechanism in closer when this feature is included in closer. Location of stops may not damage door skin or adjacent walls during door operation. Locate stops 2/3 the door width from the hinged edge of door. Wall bumper stops must be reinforced addition studs or intermediate blocking in the wall.

Door hold-open devices are discouraged and may not be installed on fire-rated or corridor doors. In selected locations approved for a hold-open device, hooks, integral stopholders, select hold-open features on overhead closers, or kick-down holders may be considered.

2.08: Thresholds: Cast-in-place threshold anchors shall be used for the installation of all thresholds. Expansion anchors are not acceptable. Acceptable products are threshold anchoring devices by National Guard Products, model 720; or Rixon Thresholder. Thresholds must beveled and no higher than 1/2". Flush thresholds are preferred at accessible entrances.

2.09 Specific Door Type Hardware Requirements

a) Entrance Doors: Closers shall not be exposed to weather. Hold-open or select-hold-open features on overhead stops shall not be used except in special cases where building function requires it. Heavy-duty mortised dead latches with a minimum throw of 3/4 inch shall be used. Provision to lock the latch in a retracted position shall be included. Egress shall be permitted when the door is locked. The latch shall be 48" above floor. Pulls that create a lever action at the point of attachment to the door shall not be used.

b) Stairwell Doors: Exterior stairwell doors shall have panic devices with pulls, lever handles, or cylinder dogging. Interior stairwell doors shall be equipped with closer, latches, and stops. Latches shall be activated by panic devices equipped with pull handles or lever handle, or push bar.

c) Doors to Roofs, Penthouses, Mechanical Rooms, Transformer Vaults, Elevator Equipment Rooms and Custodial Closets: These doors shall have self-locking locks with a free lever handle on the inside and key access only. These doors shall have closers.

d) Corridor Doors: Doors acting as fire or smoke doors that will have heavy use and be subject to abuse or will reduce the accessible path shall be equipped with magnetic hold-open devices. Pair of doors shall be equipped with fire exit hardware on each leaf and shall positively latch when the hold open mechanisms are released.

e) Yard Hydrant Cabinet Access Doors: Yard hydrant cabinet access doors shall be equipped with slot-type locks operable with a screwdriver. Key locks are not acceptable.

2.10 Exterior grills or mats should be located at all exterior doors.