CHAPTER 4 – EXTERIOR CLOSURE
CHAPTER 4—EXTERIOR CLOSURE

Section 4.1 General Requirements

4.1.1 Exterior Closure Compliance

Section 4.2 Wall Types

4.2.1 General Information
   4.2.1.1 Exterior Wall Material
   4.2.1.1.1 Limestone
   4.2.1.2 Wood Materials
   4.2.1.3 Waterproofing Materials
   4.2.1.4 Cast Stone Prohibited
   4.2.1.5 Use of EIFS Systems

4.2.2 Masonry/Stone
   4.2.2.1 Guidelines
   4.2.2.2 Brick Compliance
   4.2.2.3 Metal Objects
   4.2.2.4 Flashings
   4.2.2.5 Weeps
   4.2.2.6 Expansion Joints
   4.2.2.7 Wall Ties
   4.2.2.8 Joints
   4.2.2.9 Mortar
   4.2.2.10 Coping Stones

4.2.3 Concrete
   4.2.3.1 Cast-in-Place
     4.2.3.1.1 Flint and Chert
     4.2.3.1.2 Exterior Concrete
     4.2.3.1.3 Accessories on Concrete
     4.2.3.1.4 Testing
       4.2.3.1.4.1 Allowable Limits
       4.2.3.1.4.2 Testing Firm
       4.2.3.1.4.3 Testing Rate
       4.2.3.1.4.4 Quality Control - Contractor
     4.2.3.1.5 Calcium Chloride
   4.2.3.2 Pre-cast
     4.2.3.2.1 Requirements

4.2.4 Stucco and Exterior Insulation Finish System (EIFS)
   4.2.4.1 Stucco and Plaster
   4.2.4.2 EFIS – Primary Finish

4.2.5 Glass
   4.2.5.1 Requirements
   4.2.5.2 Aluminum Framework

Section 4.3 Penetrations

4.3.1 Doors and Frames
   4.3.1.1 Exterior Pedestrian Doors
   4.3.1.2 Stile-Type Doors
   4.3.1.3 Low-Usage/Non Public Doors
4.3.1.4 Steel Doors and Frames
4.3.1.5 Pedestrian Doors
4.3.1.6 Mullion
4.3.1.7 Public Entrances
4.3.1.8 ADA Accessible Entrances
4.3.1.9 Accessibility
4.3.1.10 Reinforcing
4.3.1.11 Keyed Removable Mullions
4.3.1.12 Entry Doors
  4.3.1.12.1 Aluminum
  4.3.1.12.2 Hollow Metal
  4.3.1.12.3 Kickplates
4.3.1.13 Entry Frames
  4.3.1.13.1 Aluminum
  4.3.1.13.2 Hollow Metal
  4.3.1.13.3 Thresholds

4.3.2 Door Hardware
4.3.2.1 Acceptable Hardware
  4.3.2.1.1 Lock Cylinders
  4.3.2.1.2 Mortise Locksets
  4.3.2.1.3 Cylindrical Deadbolts
  4.3.2.1.4 Cylindrical Passage Sets
  4.3.2.1.5 Exit Devices - Pushpad
  4.3.2.1.6 Exit Devices - Crossbar
  4.3.2.1.7 Vertical Rod
  4.3.2.1.8 Exit Device Trim Packs
  4.3.2.1.9 Door Coordinators
  4.3.2.1.10 Weather Stripping
  4.3.2.1.11 Electric Strikes
  4.3.2.1.12 Electric Key Switches
  4.3.2.1.13 Electric Door Holders
  4.3.2.1.14 Overhead Doors
  4.3.2.1.15 Masonry Walls
    4.3.2.1.15.1 Conduit
  4.3.2.1.16 Doors to Rated Corridors
  4.3.2.1.17 Salvage

4.3.2.2 Locksets
  4.3.2.2.1 Public Areas
  4.3.2.2.2 Non-Public Areas
  4.3.2.2.3 Mortise Locksets
  4.3.2.2.4 Grade 1
  4.3.2.2.5 Corbin Russwin
  4.3.2.2.6 Acceptable Brands
  4.3.2.2.7 Key Override

4.3.2.3 Panic Devices
  4.3.2.3.1 Grade
  4.3.2.3.2 Type
  4.3.2.3.3 Rim Latch Devices
  4.3.2.3.4 Acceptable Brands

4.3.2.4 Closers
  4.3.2.4.1 Heavy-Duty Grade
  4.3.2.4.2 Surface Mounting
  4.3.2.4.3 Meeting ADA Requirements
  4.3.2.4.4 Interior Side
  4.3.2.4.5 Acceptable Brands
4.3.2.5 Hinges
  4.3.2.5.1 Type and Number
  4.3.2.5.2 Pivot-style
  4.3.2.5.3 Standard of Quality

4.3.2.6 Thresholds
  4.3.2.6.1 Heavy-Duty Grade

4.3.2.7 Colors
  4.3.2.7.1 Finish

4.3.2.8 Keys and Cylinders
  4.3.2.8.1 Architect/Contractor
  4.3.2.8.2 Owner
  4.3.2.8.3 Contractor

4.3.2.9 Door Pulls

4.3.3 Power Operated Doors
  4.3.3.1 Applications
    4.3.3.1.1 ADA Accessibility - New Construction
    4.3.3.1.2 Minimum Requirement
    4.3.3.1.3 ADA Accessibility - Existing Structures
  4.3.3.2 Type of Operations
    4.3.3.2.1 Preferred Operation
    4.3.3.2.2 Automatic Mode
    4.3.3.2.3 Preferred Type
    4.3.3.2.4 Vestibule Doors
    4.3.3.2.5 Existing Construction
    4.3.3.2.6 Double Doors
  4.3.3.3 Activating Devices
    4.3.3.3.1 Preferred Activating Device
    4.3.3.3.2 Automatic Devices
    4.3.3.3.3 Least Preferred Devices
    4.3.3.3.4 After-Hours Access
    4.3.3.3.5 Wiring
    4.3.3.3.6 Deactivation Switch
    4.3.3.3.7 Wheelchair Entry
  4.3.3.4 Locking and Security
    4.3.3.4.1 Positive Locking Devices
    4.3.3.4.2 Preferred Locking System
    4.3.3.4.3 Electric Strikes
    4.3.3.4.4 Alarms
      4.3.3.4.4.1 Electric Strikes
      4.3.3.4.4.2 Electric Key Switches
      4.3.3.4.4.3 Burglar Alarm
  4.3.3.5 Signage
    4.3.3.5.1 Related to Power Operated Doors
    4.3.3.5.2 Symbols
    4.3.3.5.3 User Action Required
  4.3.3.6 Equipment
    4.3.3.6.1 Unacceptable Equipment
    4.3.3.6.2 Heavy-Duty Type
    4.3.3.6.3 Approving
    4.3.3.6.4 Control Equipment
    4.3.3.6.5 Two-Year Warranty
    4.3.3.6.6 Manual Mode

4.3.4 Windows
  4.3.4.1 Material

4-5
January 2013
4.3.4.2 Thermal Break Construction
4.3.4.3 Operating
4.3.4.4 Screens
4.3.4.5 Color
4.3.4.6 Broken Glazing
4.3.4.7 Thermal Break
4.3.4.8 Materials
4.3.4.9 Existing Construction
4.3.4.10 Compliance

4.3.5 Glass and Glazing
4.3.5.1 Glazing
4.3.5.2 Low-E Type
4.3.5.3 Tinting
CHAPTER 4—EXTERIOR CLOSURE

Section 4.1  General Requirements

4.1.1 The exterior closure of all buildings shall comply with ASHRAE 90.1.

Section 4.2  Wall Types

4.2.1 General information

4.2.1.1 The exterior wall material of choice for all university facilities is bottom ledge "Cottonwood" limestone. Some existing buildings have been constructed with a mix of "Cottonwood" limestone along the ground and "Neeva" limestone in the upper areas of the buildings. "Cottonwood" bottom ledge is a denser stone and withstands weathering better than "Neeva." There are color differences between the two.

4.2.1.1.1 Kansas limestone will be specified for all projects that involve an addition to one of our existing limestone buildings. The bid specifications can include as an alternate the use of other (non-Kansas) limestone for new freestanding buildings to be constructed on the Manhattan campus. However, a decision to accept such material as an alternate would require a careful comparison of that material with the color, texture and overall appearance of the limestone exteriors of surrounding campus buildings.

4.2.1.2 No exterior wall surfaces shall be constructed of wood materials. The possible exceptions to this are areas that need to match existing wood surfaces to provide historical or aesthetic continuity.

4.2.1.3 Waterproofing or water repellent materials shall not be installed on masonry, concrete, or stone surfaces.

4.2.1.4 The use of "Cast stone" or similar man-made products is prohibited.

4.2.1.5 The use of EIFS systems is only allowed under the most unusual of circumstances and locations. Do not assume this product will be allowed on the main campuses or Vet Med.

4.2.2 Masonry/Stone

4.2.2.1 The design and construction guidelines and technical notes of the Brick Institute of America shall be followed for brick construction, and the Masonry Advisory Council for concrete masonry unit construction.

4.2.2.2 All brick shall comply with ASTM C216 and shall have a rating of no "efflorescence" when tested according to ASTM C67. The owner shall retain an independent testing agency that will randomly test brick delivered to the site for compliance with the above.

4.2.2.3 All shelf angles and other metal objects incorporated into masonry walls shall be hot dipped galvanized and shall have stainless steel fasteners.

4.2.2.4 All flashings shall extend a minimum of 1/4" beyond the face of the wall and shall be bent to form a drip edge.

4.2.2.5 Weeps shall be installed above each flashing. The weeps may be tubes installed at 24"
on center, or rope weeps, installed at 16" on center. Other types of weeps may be used if the manufacturer's recommendations are followed regarding the spacing and installation to ensure adequate drainage.

4.2.2.6 The designer shall evaluate the expected movement for each wall and require adequate expansion joints to accommodate the movement in addition to those required by the Building Code.

4.2.2.7 Wall ties shall be galvanized steel, of a quality equal to Hohmann & Barnard, Inc., DW10 Box Wall Tie.

4.2.2.8 At joints of different types of materials, (brick and stone, brick and cast concrete, etc.) the mortar shall be raked back a sufficient depth to allow the installation of a backer rod and sealant in the joint. The sealant installation details shall comply with the manufacturer's recommendations.

4.2.2.9 Masonry and stone walls shall be installed without mortar dropping in the wall cavity.

4.2.2.10 Coping stones shall be secured with stainless steel anchors and pins and shall have a continuous rubber membrane flashing beneath the stones that extends flush to the surface of the wall, but not past the exterior surface. All head joints of coping stones shall have joint sealant installed rather than mortar or grout.

4.2.3 Concrete

4.2.3.1 Cast-in-place

4.2.3.1.1 Flint and chert shall be limited to 1% maximum, by weight, in all concrete. Lignite shall be limited to 0.07%, by weight of the fine aggregate.

4.2.3.1.2 All exterior concrete shall have a minimum of 6% (±1%) air entrained.

4.2.3.1.3 All accessories that touch the surface of the concrete shall be coated with plastic or epoxy to prevent rust.

4.2.3.1.4 Testing

4.2.3.1.4.1 The concrete shall be tested for strength, air entrainment, temperature, and slump. The specifications shall indicate allowable limits for each.

4.2.3.1.4.2 The university will retain the services of a testing firm. The contractor shall be responsible for scheduling the tests. The contractor shall be required to notify the owner's representative a minimum of 48 hours prior to all placement of concrete.

4.2.3.1.4.3 Concrete shall be tested at the minimum rate of one test for the first 25 CY. placed each day, and one test for each additional 50 CY. placed. The concrete may be tested more often at the discretion of the owner's representative.
4.2.3.1.4.4 The specifications shall make it clear to the contractor that quality control is the responsibility of the contractor. The above testing in no way relieves the contractor of the responsibility to comply with the specifications.

4.2.3.1.5 Calcium chloride shall not be permitted.

4.2.3.2 Pre-cast

4.2.3.2.1 Concrete used in pre-cast panels shall comply with cast-in place requirements noted above.

4.2.4 Stucco and Exterior Insulation Finish System (EIFS)

4.2.4.1 No stucco or plaster shall be used.

4.2.4.2 EIFS shall not be used as the primary finish of a building or major renovation, except in the area of the athletic complex, where specific areas of use may be considered.

4.2.5 Glass

4.2.5.1 All glass systems shall be insulated, double pane glass with thermal break frame construction.

4.2.5.2 All framework shall be aluminum. No steel shall be allowed. Refer to 4.3.5.3 for color selection.

Section 4.3 Penetrations

4.3.1 Doors and frames

4.3.1.1 All exterior pedestrian doors and frames shall be metal and comply with ASHRAE 90.1.

4.3.1.2 Stile-type doors and their frames shall be made of aluminum with all welded construction. All wide stile doors shall have a center rail. All material shall have a minimum thickness of 3/16" and shall be reinforced at hardware locations. Stile doors shall be 2" thick with a minimum stile width of 3 1/2". All bottom rails shall be a minimum of 10" in height. All doors shall have a center-locking rail. Kawneer 350 Tuffline should be used as a standard of quality.

4.3.1.3 Low-usage or non-public doors (mechanical areas, etc.) may be steel doors with steel frames. All steel shall be galvanized, shop-primed, and painted with an epoxy or comparable paint. All steel doors and frames shall be of welded construction. Steel doors shall have a top channel cap, secured in place and sealed.

4.3.1.4 Steel doors and frames shall be a minimum of 16 gauge, and shall be reinforced at hardware locations. All steel doors shall be 1 ¾" thick.

4.3.1.5 All pedestrian doors shall have a minimum size of 3’ in width and 7’ in height.

4.3.1.6 It is required that double doors have a fixed, center mullion. The mullions shall be key removable.

4.3.1.7 In all new construction, all public entrances to the building shall be accessible to
persons with disabilities. Exceptions to this must be approved by the owner.

4.3.1.8 In existing structures, a minimum of one entrance shall be accessible to persons with disabilities.

4.3.1.9 In existing structures, any design for construction in the vicinity of an entrance should evaluate the possibility of making that entrance accessible. Whenever it is physically and economically feasible, all entrances should be made accessible.

4.3.1.10 All frames will have reinforcing at hinges and closer.

4.3.1.11 Keyed Removable Mullions - all keyed removable mullions are required to accept Corbin 7 pin lock cylinders. Precision, Detex, or Sargent. All mullions are to be 2” minimum thickness.

4.3.1.12 Entry Doors:

4.3.1.12.1 Entry door aluminum - extra heavy duty use, 1¾” thick aluminum insulated thermal break frame doors with 1” insulated glass. Doors to have 1'-4" bottom rails, 8½” center rails and wide stiles.

4.3.1.12.2 Entry Doors (Hollow Metal) - hollow metal exterior doors to be galvanized and insulated. Painted finish.

4.3.1.12.3 Entry Door Kickplates - all entry doors are required to have kickplates.

4.3.1.13 Entry Frames:

4.3.1.13.1 Entry Door Frames Aluminum - extra heavy duty use, 1¾” x 4½” aluminum thermal break frame with 1” insulated glass sidelights. Sidelights to have 7½” minimum bottom frame.

4.3.1.13.2 Entry Door Frames (Hollow Metal) - exterior hollow metal frames to be galvanized and insulated. Painted finish.

4.3.1.13.3 Entry Door Thresholds - use ADA accessible aluminum threshold.

4.3.2 Door hardware

4.3.2.1 The following door hardware is acceptable. Other proposed equals will be reviewed by the Facilities Planning Office and the Facilities Lock Shop.

4.3.2.1.1 All doors must accept 1 ¼” mortise cylinder or 7 pin rim device of prescribed keyway, keying to be coordinated with the K-State Lock Shop. Key control system will be provided by K-State Lock Shop.

4.3.2.1.2 Mortise Locksets shall be Corbin Russwin ML2000.

4.3.2.1.3 Cylindrical Deadbolts shall be Corbin Russwin DL3000.

4.3.2.1.4 Cylindrical Passage Sets shall be Weiser.

4.3.2.1.5 Exit Devices, Pushpad Rim, Precision 1100 series preferred; Sargent 1100 series, Dorma 9300 series.
4.3.2.1.6 Exit Devices, Crossbar Rim, shall be Sargent 9800 or Corbin ED6000.

4.3.2.1.7 Exit Devices, Vertical Rod - Sargent 8700, Corbin ED 6400 are allowed. Vertical rod devices are not allowed.

4.3.2.1.8 Exit Device Trim Packs shall be Precision 39LC, Sargent ETJ, Corbin L3 or any comparable to Corbin LWA Mortise trim.

4.3.2.1.9 Door Coordinators shall be DCI 600 Series.

4.3.2.1.10 Weather Stripping and Smoke Seals shall be surface mounted on doorstop and must have ¼" adjustment slots.

4.3.2.1.11 Electric Strikes shall be Hanchett 12 vdc Fail Secure, 7000 Series, 2005 Smart Pack II or Folger Adam with Precision door hardware for fire rated devices.

4.3.2.1.12 Electric Key Switches shall be Locknetics 640 Series, HD Key Switch 643 0404, L2 option.

4.3.2.1.13 Electric Door Holders shall have metal covers.

4.3.2.1.14 Overhead Doors shall accept Corbin 7 pin Rim Cylinders.

4.3.2.1.15 Doors in masonry walls

4.3.2.1.15.1 ½" conduit shall be installed in the wall on the latch side of the door. The conduit shall extend out of the corridor side of the wall from above the ceiling line and terminate at a 3 square Styrofoam "block out" in the wall and frame at the same height as the latch. This is for low-voltage electric key card latches to be installed in the future.

4.3.2.1.16 All doors opening into rated corridors or areas shall have electric hold open devices.

4.3.2.1.17 Salvage rights of door hardware by owner - notify the K-State Lock Shop 10 working days prior to demolition/construction projects. The K-State Lock Shop will remove the hardware prior to the day that the contractor will start the project.

4.3.2.2 Locksets: (rim latch devices are required; this will require a center mullion)

4.3.2.2.1 All public areas shall be served by lever-handle locksets, similar to Corbin Russwin ML2200 series.

4.3.2.2.2 All non-public areas (mechanical, custodian, serving, etc.) shall be served by knurled handle locksets, similar to Corbin Russwin ML2200 series.

4.3.2.2.3 Mortise locksets shall be used in all areas. Cylindrical style locksets will require special approval.
4.3.2.4 All locksets shall be grade 1, and be on the approved list for KSU.

4.3.2.5 All locksets shall accept Corbin Russwin 7 pin cores or cylinders.

4.3.2.6 These brands of locksets are acceptable to the owner: Corbin Russwin and Sargent. Other brands require the approval of the owner. Brands found unacceptable to the owner are: Falcon, Yale, and Lockwood.

4.3.2.7 Any other types of locksets used must have a key override function.

4.3.2.3 Panic devices:

4.3.2.3.1 All panic devices shall be heavy-duty grade.

4.3.2.3.2 All panic devices shall be of the "touch-bar" or "cross-bar" type and shall have a dogging function.

4.3.2.3.3 Rim latch devices are preferred. In double door situations this requires a center mullion. In cases where center mullions are not desirable or not allowed by code, surface-mounted latches are preferred over concealed vertical rods.

4.3.2.3.4 These brands of panic devices are acceptable to the owner: Von Duprin, Sargent and Precision. Other brands require the approval of the owner. Brands found unacceptable are: Yale, Monarch and Dor-A-Matic. Precision should be used as a standard of quality.

4.3.2.4 Closers:

4.3.2.4.1 All closers shall be heavy-duty or institutional grade. Parallel arms are preferred.

4.3.2.4.2 Surface mounting is preferred. Other types of mounting require the approval of the owner. All doors and frames shall be reinforced at mounting locations. All screw and bolt holes shall be drilled and tapped. Self-tapping screws are not acceptable.

4.3.2.4.3 Accessible doors are preferred to be power-operated: refer to 4.3.3 for details. Those that are not power-operated shall meet the pounds-of-pull requirements of ADA.

4.3.2.4.4 All closers shall be mounted on the interior side of the door/frame whenever possible.

4.3.2.4.5 These brands of closers are acceptable to the owner: LCN, Corbin Russwin, and Sargent. Other brands require the approval of the owner. LCN should be used as a standard of quality.

4.3.2.5 Hinges:

4.3.2.5.1 All hinges shall be heavy-duty grade, ball-bearing type. All doors require 1½ pairs of hinges per door.

4.3.2.5.2 Exterior door to have pivot style hinges 1 ½ pair.
4.3.2.5.3 Hager model #1191BB should be used as a standard of quality.

4.3.2.6 Thresholds:

4.3.2.6.1 All thresholds, regardless of door configuration, shall be heavy-duty grade, constructed of aluminum and meet ADA requirements.

4.3.2.7 Colors:

4.3.2.7.1 All door hardware shall have either US 10 or US 26D finish. Other colors of hardware finish must be approved by the owner. In existing construction, the hardware color should match the existing hardware color. The standardization on colors will allow Division of Facilities to stock replacements. Some buildings have more than one color of hardware already. New hardware should match the predominant color if it is one of the two standard colors. Otherwise, the owner will pick one of the standard colors.

4.3.2.8 Keys and cylinders:

4.3.2.8.1 Early in the design phase, the architect should discuss the keying of the lock cylinders with the owner or the contractor will be responsible for the keying of the lock cylinders.

4.3.2.8.2 If the owner is to do the keying of lock cylinders, the specifications shall require the contractor to supply Corbin Russwin 7-pin cylinders with two key blanks, as required, for each lock.

4.3.2.8.3 If the contractor is responsible for the keying of lock cylinders, the contractor is required to use the Corbin Russwin Architectural Hardware Co. of Charlotte, NC. to do all keying work per the keying schedule by the owner. The contractor will supply Corbin Russwin 7-pin lock cylinders and two keys to fit each lock cylinder. The contractor will install the lock cylinders and provide location tagged keys to the owner.

4.3.2.9 Door pulls with an offset design shall not be used.

4.3.3 Power operated doors

4.3.3.1 Applications for power operated doors

4.3.3.1.1 In all new construction, all public entrances to the building shall be accessible to persons with disabilities. Any exceptions to this must be approved by the owner. The main entrance shall be provided with one door, or set of doors, that is power operated. Additionally, if an entrance to the building other than the main entrance is located closer to the parking designated for persons with disabilities, that entrance shall also be power operated.

4.3.3.1.2 The above item should be regarded as a minimum requirement. If the expected users of the building include a larger than normal percentage of persons with disabilities, other entrances to the building shall also be power operated.

4-13
January 2013
4.3.3.1.3 In existing structures, a minimum of one entrance shall be accessible to persons with disabilities. That entrance shall be power operated. The accessible entrance shall be either the main entrance or the entrance closest to the parking designated for persons with disabilities.

4.3.3.2 Type of operations

4.3.3.2.1 The preferred operation is for the doors to be power operated only on demand. Without specific action the door should function as a normal door. The desire is to have the most maintenance-free installation that serves the needs of persons with disabilities. Swinging-type doors that are normally operated in a manual mode and power operated on demand is considered to be the best combination.

4.3.3.2.2 It is recognized that in some instances it will be necessary or preferred for the door to operate in a fully automatic mode. This type of installation requires the approval of the owner. It should only be considered in areas that can reasonably expect a high level of usage by persons with disabilities.

4.3.3.2.3 It is preferred that the doors be swinging-type doors. In areas that may receive high usage by persons with disabilities, sliding doors may be appropriate. This type of installation requires the approval of the owner.

4.3.3.2.4 In new construction, and in existing construction where possible, the inner and outer doors of a vestibule should operate individually. This will require the user to separately activate both doors of a vestibule. Individual operation of the inner and outer doors allows the vestibule to maintain its integrity as an airlock for energy conservation purposes.

4.3.3.2.5 In existing construction, where space is not available for individual activation, the doors should both open upon activation by the user.

4.3.3.2.6 In double door situations, only one leaf should be power operated unless the anticipated traffic levels indicate otherwise.

4.3.3.3 Activating devices

4.3.3.3.1 The preferred activating device is a push-button. This device shall be used on all non-automatic installations.

4.3.3.3.2 In installations where the operation is fully automatic, the activating devices shall be of the infrared light beam type that detects the presence of the user in a very narrow area.

4.3.3.3.3 The least preferable devices are area motion sensors and floor mats. Use of these devices should be avoided and requires the prior approval of the owner.

4.3.3.3.4 During the design phase of a project, the designer should determine the need for after-hours access by persons with disabilities. In those cases where such access is needed, additional
secure activating devices and electric strikes or locks may be required. Discuss all options with Owner prior to proceeding.

4.3.3.5 All installations shall be wired to support the future installation of additional secure activating devices, hold opens and electric locks or strikes.

4.3.3.6 Each system shall be provided with a keyed deactivation switch that is easily accessible from floor level.

4.3.3.7 Automatic opening door openers for wheelchair entry shall be Besam, Dor-o-matic or Entrance Technology, automatic openers. With touchless electronic sensor mounted on the protective handrail on each side of door. Include signs as per ADA requirements. Floor mats with sensors are not allowed.

4.3.4 Locking and Security

4.3.4.1 All installations shall be provided with positive locking devices. Simply deactivating the door operating system does not provide the security level desired.

4.3.4.2 The preferred locking system uses the panic devices normally found on entrance doors.

4.3.4.3 On those systems that require after-hours operation, the use of electric strikes is preferred. Electric locks should be avoided if possible.

4.3.4.4 Classrooms which require alarms:

4.3.4.4.1 Electric Strike - by K-State Facilities, contractor provide ½" empty conduit from hollow metal frame to above finish clg.

4.3.4.4.2 Electric Key Switches - by K-State Facilities contractor provide ½" empty conduit from hollow metal frames to above finish clg.

4.3.4.4.3 Burglar Alarm - by K-State Facilities connected to electric strikes and key switch.

4.3.5 Signage

4.3.5.1 All signage related to power operated doors shall use the universally recognized blue symbols and characters on a white background.

4.3.5.2 Every power-operated door shall have the universal symbol for accessibility located near the latch side of the door. The sign should be mounted either on the wall next to the door (preferred) or on the door (if necessary), depending on the situation.

4.3.5.3 Every switch or other operator requiring user action shall have a sign located in close proximity to the switch. This sign shall consist of the universal symbol for accessibility and any...
instructions that apply to the operation of the door. The switches are sometimes lost in the surrounding structure. These signs are to alert the users to the existence of the switches and to give instructions.

4.3.3.6 Equipment

4.3.3.6.1 Power assist equipment of any type shall not be allowed. Pneumatically actuated equipment of any type shall not be allowed.

4.3.3.6.2 All door operating equipment shall be rated for heavy-duty service.

4.3.3.6.3 In specifying and approving door-operating equipment, prime consideration shall be given to the ready availability of service and replacement parts. The following brands have support available on a timely basis at the present time: Doormatic, Stanley, Besam, Horton, and Able.

4.3.3.6.4 All control equipment shall be compatible with the voltage requirements of the university building security system.

4.3.3.6.5 All door operating equipment shall have a two year warranty.

4.3.3.6.6 In manual mode, no power assist of any type shall occur. The operators shall require no more than 15 lbs. to set in motion and not more than 10 lbs. to continue movement.

4.3.4 Windows

4.3.4.1 All windows shall be constructed of aluminum and shall comply with ASHRAE 90.1.

4.3.4.2 All windows shall have thermal break construction.

4.3.4.3 All windows installed in areas normally occupied by people shall be operable, except in those areas required by code to maintain a specific air balance. All operating mechanisms shall be of heavy-duty, institutional grade construction. All operable windows shall be capable of being cleaned from the interior of the building, and shall be supplied with a positive locking device.

4.3.4.4 Screens shall not be supplied with windows.

4.3.4.5 All windows installed in a building on the campus shall be the standard University medium bronze color. In existing structures, the color shall match the color of the existing windows and/or doors with the concurrence of the Owner.

4.3.4.6 In specifying windows, consideration shall be given to the replacement of broken glazing. It is preferred that replacement be possible from the interior of the building. Other types of windows require the approval of the Owner.

4.3.4.7 The details of the window installation shall provide for a thermal break between the window material and the finish material of the interior wall.

4.3.4.8 Material used for windowsills shall not include particleboard. Plastic laminate on solid wood or exterior grade plywood is acceptable. Other, more durable materials should be evaluated on a lifetime cost basis.
4.3.4.9 In existing construction, if any of the existing windows or parts of windows are removed, that material shall be returned to the owner for storage.

4.3.4.10 All window units shall comply with ASTM E283, E331, and E547. These tests shall be performed on the site after installation. The owner will retain the services of a testing company to perform these tests on window units chosen at random by the owner. If any window units fail the tests, the contractor shall be responsible for retesting.

4.3.5 Glass and glazing

4.3.5.1 All glazing in new windows, doors, storefronts, etc. shall be 1" double-pane insulated glass, and shall carry a 10-year warranty on replacement of defective material.

4.3.5.2 All glazing shall be of the low-E type.

4.3.5.3 Glazing in windows on the campus shall have a light bronze tint.