

Division 08 - Openings

08 10 00 Doors and Frames

1. Doors to rooms storing high value items such as computers, scientific equipment, etc. shall have solid doors without vision panels and without adjacent sidelights.
2. The A/E must submit the door manufacturer list early in the design process for review and approval by George Mason University.

08 11 00 Metal Doors and Frames

1. Specify exterior door faces with minimum 0.0635-inch (16 gauge) galvanized steel, and flush edges, including door tops. Specify exterior door frames with minimum 0.0785-inch (14 gauge) galvanized steel and with fully-welded drainage channel at head of each door.
2. Specify interior door faces with minimum 0.0478-inch (18 gauge) steel. Specify interior door frames with minimum 0.0598-inch (16 gauge) steel.
3. Acceptable Products: Curries Series 707, or CECO Legion, or Steelcraft L Series.
4. Knock-down frames are not permitted unless specifically approved in writing by George Mason University.

08 14 00 Wood Doors

1. Do not specify exterior wood doors unless approval is obtained from George Mason University.
2. Specify interior wood doors with solid core, using mineral core where a fire rating is required, or high density particle board core or wood stave core on non-rated doors.

Acceptable Products: As manufactured by Marshfield, or approved equivalents manufactured by VT Industries or Eggers.
3. Specify clear or stained finished wood doors with factory finishing and pre-machining for hardware. Specify door edges with solid wood matching wood face veneer.

08 33 00 Coiling Doors and Grilles

1. Specify steel slats for exterior coiling doors, unless insulated, in which case aluminum slats are acceptable.
2. Specify only fusible links for automatic closing rolling steel fire doors. Specifying both detectors and fusible links together is not permitted.
3. Fire shutters are not permitted; provide water curtains instead.

08 40 00 Entrances, Storefronts, and Curtain Walls

1. Specify wide-stile aluminum doors with minimum 5-inch stiles, 5-inch top rail and 10-inch bottom rail.
2. Specify that all hardware, with the exception of cylinders, shall be furnished and installed by the aluminum door manufacturer. Specify cylinders for these doors with the rest of finish hardware and matching the building system.
3. Specify only the following hardware for aluminum doors. No other manufacturers or products will be accepted:

ITEM	MANUFACTURER	MODEL NO.
Hinge	Roton Continuous or Stanley	FBB-199 US32D
Closer	LCN	4040 x CUSH x Alum.
Exit Device	Von Duprin	99 rim x 990NL (RHRB Door)
Mullion	Reed	8000 Series (Steel)
Threshold	Reese, or Approved Equal	
Weather-strip	Door manufacturer	

4. Specify finish hardware with US26D finish, with the exception of sprayed aluminum finish on door closers.
5. Typical door hardware schedule for aluminum entry doors:
 - Each Leaf;
 - 1 - Hinge Roton 780-053HD X Alum.
 - 1 - Exit Device Von Duprin 99 X 990NL X US26D
 - 1 - Door Closer LCN 4040 X CUSH X Alum.
 - Silencers GJ-64
 - Per Pair;
 - 1 - Removable Mullion Yale M-100
 - 1 - Threshold Zero or Approved Equal.

08 42 00 Automatic Entrance Doors

1. Specify that hinges and exit devices are to be installed with through-bolts. Specify spanner heads at exposed screws and bolts.
2. Specify frame reinforcement for overhead surface-mounted door operators.
3. Specify 120VAC power supply directly to each door operator.
4. Specify self-contained solid state circuit controller for operating and switching the swing power operator. The electronic control shall provide low voltage power supply for all means of actuation. External or auxiliary low voltage power source are not permitted. Specify adjustable time delay of 1 to 60 seconds, for normal cycle, as well as the following built-in features:
 - Torque limiting for controlled forces on opening,
 - Acceleration control for smooth starts and recycle,
 - Special circuitry for reducing power to the motor when door is in “Hold-Open” mode, extending longevity and assuring reliability.
5. Safety Sensors: VISONPULSE: The swing door presence sensor shall be mounted to each side of the swing door approach and swing path and shall be complete in all respects consisting of the following:
 - Extruded Aluminum housing of 6063-T52 alloy sized to run full width of door, integral high impact, tinted acrylic lenses and injection molded end caps.

- Solid state electronics interfaced to alternating rows of light emitting diodes and receivers contained within the extruded aluminum housing.
- Long/short range switch and flexible cable.
- Sensor shall be capable of operation within temperature ranges of -20F and 160F. Vision pulse shall detect presence not motion and shall not be restricted in application due to door design, construction, material or glass type. Ambient light and radio frequencies shall not interfere with the sensors performance.

ITEM	MANUFACTURER	MODEL NO.
Hinge	Roton or Select Products Limited. No Substitution	
Automatic Operator	NABCO Entrances, Inc. (Low Energy Type). No Substitutions	Gyrotech 500
(*) Electric Strike	Von Duprin 6000 Series 24VDC Fail secure	Model to suit application. No Substitution
(*) Exit Device	Von Duprin	99NL-F x US26D No Substitutions
Threshold	Zero (or) Approved Equal.	
Weather Strip	Zero (or) Approved Equal	

NOTE: (*) May not be required depending on application.

08 50 00 Windows (Exterior & Interior)

1. Where divided lites are required, specify muntins installed in insulating glass units, between the panes of glass.
2. At residential windows specify insect screens in aluminum frames, flat black. At ground floor residential windows specify security mesh in steel sash, flat black.

08 60 00 Roof Windows and Skylights

1. Skylights are not permitted unless special permission has been obtained from George Mason University. Such permission will not be granted without extremely strong reasons. If skylights are accepted by George Mason University, specify continuous inspection of skylight flashing during installation.

08 71 00 Hardware

1. The following hardware for the types of buildings indicated shall be provided.

ITEM	MANUFACTURER	MODEL NO. ACADEMIC BUILDINGS	MODEL NO. HOUSING FACILITIES
Butt Hinges, Interior	Stanley	FBB-179 4-1/2 USP or approved equal	FBB-179 4-1/2 USP

Butt Hinges, Exterior	Stanley	FBB-199 4-1/2 US32D or Approved Equal	FBB-199 4-1/2 US32D
Continuous Hinges	Roton or Zero	Continuous (to suit application)	
Locksets & Latch Sets	Best	93K Series	
Key Cylinders	Best	7 pin	
Flush Bolts	Ives	457-B26D or Approved Equal	457-B26D
Exit Devices	Von Duprin	99x990NL x US26D 1103 x 17	99 Series 1100 Series
Removable Mullions	Yale	M100 Series	M100 Series
Door Closers	LCN	4040 x Sprayed Alum.	4040 Series
Door Stops / Holders	Glynn - Johnson	500 Series Non H. O.	500 Series Non H. O.
Wall Bumpers	Ives	407 - 1/2 x B26D or Approved Equal	407 - 1/2 x B26D
Push Plates	Rockwood	70 3-1/2 x 15 US26D	70 3-1/2 x 15 USD26D
Pull Plates	Rockwood	123 x 73 3-1/2 x 15	123 x 73 3-12 x 15
Mop Plates	Rockwood	18-8-inches	18-8-inches
Kick Plates	Rockwood or Approved Equal	18-12-inches	18-12-inches
Silencers	Glynn-Johnson or Approved Equal	No. 64	No. 64

2. Specify and schedule a hardware set for each door opening in the building. Specifying hardware by allowance is prohibited.
3. Specify finish hardware with 626, Satin Chrome (US26D) finish, with the exception of sprayed aluminum finish on door closers. Specify Protection Plates, Push, and Pulls with 630, Stainless Steel (US32) finish. Specify aluminum items to be finished to match predominant adjacent material, and seals to coordinate with frame color.
4. Obtain George Mason University approval to use hardware not listed below.
5. In addition to these hardware requirements, see those for automatic door openers.
6. Require written guarantee from hardware manufacturers as follows:
 - Locksets: Five (5) years
 - Exit Devices: Five (5) years
 - Closers: Ten (10) years

Electronic closers: Two (2) years.

All other hardware: Two (2) years.

7. Locksets and latches shall be Best 9K extra-heavy-duty cylindrical with Best 7-pin interchangeable core to match existing product throughout the Campus. Lockset and Cores to be of the same manufacturer to maintain complete lockset warranty. Locks to have solid shank with no opening for access to keyed lever keeper. Lock chassis must be through-bolted outside of the lock chassis prep to prevent rotation of chassis after installation. Lock manufacturer shall provide a five (5) year warranty, in writing, to the Owner, along with three copies of the lock service manual. Strikes shall be 16 gauge curved brass, bronze or stainless steel with a 1-inches deep box construction, and have sufficient length to clear trim and protect clothing. Specify lever handles on all doors.

Product: Best 93K7 15D x 626

Cores / Cylinders: Best 7-Pin with "Premium" Keyway to match existing system.

8. Hinges: Outswinging exterior doors shall have non-removable pin hinges (NRP). Exterior hinges to be brass, bronze or stainless steel material. Hinges shall be extra heavy weight for high frequency openings or doors over 36-inches in width. All hinge open widths shall be 4.5-inches minimum, but of sufficient size to permit door to swing 180. Furnish hinges with three knuckles and concealed bearing. Plain bearing shall not be permitted.
9. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
10. Exit Devices: Furnish all sets at wood doors with sex bolts unless otherwise specified in Wood Door Section/ Hardware blocking. Trim of exit devices to match trim of locksets. Provide rim devices at single doors. At pairs of doors with low visibility provide two rim devices with key removable mullion. At doors with high visibility, provide concealed vertical rod devices. Depending on location, at exterior openings provide two surface vertical rod devices or two rim devices with key removable mullions.

Product: Exit Device Series: Von Duprin 99 series rim with cylinder dogging (CD) at standard non rated hollow metal and wood doors openings. Omit CD at fire rated doors.

Product: Exit Device Series: Von Duprin 99 series rim with cylinder dogging (CD) at narrow stile aluminum door openings. Omit CD at fire rated doors.

Product: Heavy Duty Lever Trim: Von Duprin 99 series rim. Vandal Resistant Lever Trim.

11. Specify exit-only devices at exterior doors which are not the main access point to the building. Indicate that these doors are to be connected to the fire alarm system. Indicate that such doors shall be clearly marked on the inside that opening the door will sound an alarm.
12. Concealed vertical rod exit devices are not permitted. Specify only those exit devices and manufacturers listed below.
13. At pairs of doors specify rim-type exit devices latching into removable mullion or into strike on second leaf. When no removable mullion is provided, specify a door coordinator.
14. Specify removable mullions at pairs of entry doors.

Product: Keyed Removable Mullions: Von Duprin 99 series rim. Mullion shall be furnished with a cylinder keyed into the existing GMU keying system.

15. Surface Door Closers: Full rack and pinion type with removable non-ferrous cover. Provide sex bolts at all wood doors unless otherwise specified in Wood Door Section/Hardware blocking. Place closers inside building, stairs, and rooms. Closers shall be non-handed, non-sized and adjustable. All closers shall be R14 die cast aluminum alloy material.

Product: Closer Series: Ryobi D-4550 / D-4551 Forged Heavy Duty Arm (HDA). Provide multi-size 1 through 6 at all doors rated or not.

- Product: Exterior and high frequency openings to receive D-4550 Series with HDA.
- Product: Interior and low frequency openings to receive D-3551 Series with HDA.
- Flush transom offset brackets shall be used where parallel arm closers are listed for doors with fixed panels over.
- Drop brackets are required at narrow head rails.
- Set exterior doors closers to have 8.5 lbs maximum pressure to open, interior non-rated at 5 lbs , rated openings at 12 lbs. and meet all ADA requirements.
- All closers shall come standard with barrier free feature and all weather fluid.
16. Floor type or overhead concealed door closers are not permitted.
 17. Kickplates: Provide with four beveled edges, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors unless otherwise specified.. Furnish Type "A" screws to match finish.
 18. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
 19. Wall stops or floor stops are not permitted.
 20. Screws: All exposed screws shall be Phillips head.
 21. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.
 22. Specify keyed locksets and cylinders to be provided with Best brass construction cores and keys during the construction period. Plastic construction cores will not be permitted. Construction control and operating keys and core shall not be part of Mason's permanent Best keying system or furnished on the same keyway (or key section) as Mason's permanent Best keying system. Permanent Best cores and keys shall be prepared according to the approved keying schedule and will be furnished to George Mason University by the local Best factory representative prior to occupancy.
 23. Specify cylinders to be Best 7-pin, interchangeable core "Premium" Keyway to match existing key system. (Note, "WC" keyway at Fairfax and Arlington Campus and "WH" keyway at Prince William Campus.)
 24. Specify that permanent Best keys and cores shall be stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. All permanent keys and key blanks shall be stamped "GMU - Unlawful to Duplicate."
 25. Furnish keys in the following quantities:
 - Grand Masterkeys: Zero (0) each
 - Masterkeys per set: Zero (0) each
 - Change Keys each keyed core: Four (4) each
 - Permanent Control key: Zero (0) each
 - Construction Keys: Nine (9) each
 - Construction Control key: One (1) each
 - Key blanks: Two hundred (200)
 26. Special Note: All Grand Masterkeys, Masterkeys, and other security keys shall be "cut" by George Mason University Security Department. Furnish one hundred (100) extra key blanks in the appropriate GMK & MK keyway for Owners use.
 27. George Mason University will install permanent cores and return the construction cores to the Hardware Distributor. All Construction cores and keys remain the property of the Hardware Distributor.

28. Require that the Contractor submit three copies of the detailed schedule indicating clearly how the University's final instructions on keying of locks has been fulfilled.
29. Typical Door Schedules are as follows:
- Non-Public Toilet:
 - 1-1/2 pr. Butts
 - 1 - Stanley FBB179 X US26D
 - 1 - Privacy Set Best 93K Series w/ privacy lock
 - 1 - Door Closer LCN 4041 X Alum.
 - Silencers GJ-64
 - Storage Room, Custodial Closets
 - Note: Same set shall apply to Mechanical and Electrical Rooms. However, lever trim shall not be used (knurled knob trim required).
 - 1-1/2 pr. Butts Stanley FBB179 X US26D
 - 1 Lockset Best 93K Series
 - Silencers GJ-64
 - Office Doors
 - 1-1/2 pr. Butts Stanley FBB179 X US26D
 - 1 Lockset Best 93K Series
 - 1 Door Closer LCN 4041 X Alum. (optional)
 - Silencers GJ-64
 - Public Toilet
 - 1-1/2 pr. Butts Stanley FBB179 X US26D
 - 1 Pull Plate
 - 1 Push Plate
 - 1 Kickplate
 - 1 Mop Plate
 - 1 Closer LCN 4041
 - Silencers GJ-64
 - Classrooms, Laboratories
 - 1-1/2PR. Butts Stanley FBB179 X US26D
 - 1 - Lockset Best 93K Series
 - 1 - Closer LCN 4041 (optional)
 - Silencers GJ-64
30. Elevator and Fire Alarm Panel Keys
- Specify locking hardware for elevators and fire alarm panels such that it can be operated with existing keys.
31. Furnish one (1) Key Cabinet similar to Lund 1205A , with capacity of one (1) hook per cylinder, plus an additional one hundred (100) percent expansion.
32. Hardware installation locations:
- Bottom Hinge: 10 inches from door bottom to bottom of hinge.
 - Top Hinge: 5 inches from door top to top of hinge.
 - Center Hinge: Center between top and bottom hinge.
 - Extra Hinge: 6 inches from bottom of top hinge to top of extra hinge.
 - Lockset/Latchset: 38 inches from finished floor to center of lever or knob.
 - Push Bar: 44 inches from bottom of door to center of bar.
 - Push Plate: 44 inches from bottom of door to center of plate.
 - Pull Plate: 42 inches from bottom of door to center of pull.
 - Exit Device: 39-13/16 inches from finished floor to center of pad.

Deadlock Strike: 44 inches from floor, centered.

08 80 00 Glazing

1. Specify exterior glazing to be insulating glass units consisting of clear glass with low-e coating, unless otherwise approved by the University.

08 90 00 Louvers and Vents

1. Specify fixed-drainable blade aluminum louvers unless specifically approved by the University.
2. Specify bird screen at interior of all louvers.