

DIVISION 8 – OPENINGS

08 00 00 GENERAL

A. General

1. Generally, select materials, products and design assemblies to withstand abuse, high frequency use, and minimal maintenance. The standard size of all doors shall be 36" x 84" for interior and exterior.
2. Number all door openings, lockable mechanical chase doors, roll-down doors, and roof access hatches or doors. Number in accordance with room or area number. If multiple doors for the same room, use letter designation following number. If remodeling an existing building, consult with Owner's Representative to obtain existing room and door numbers. Exterior doors must also be numbered separately. All room numbers and door numbers must be coordinated with Owner before bid documents are issued.
3. Provide vision panels in doors except at private offices and high security areas. Vision panels should be no more than 43 inches above the floor to be usable by persons with disabilities, in wheelchairs, and those of short stature. (This height will also allow panic devices to be mounted at approximately 40 inches above the floor.)
4. Provide wide openings for dock areas and for laboratories to accommodate moving of oversized equipment.
5. Wide openings may be accomplished by:
 - a) A pair of doors both 3' wide with a Best keyed removable/lockable mullion.
 - b) A pair of doors with minimum 3'-0" wide active leaf and minimum 1'-0" wide inactive leaf. Discuss required hardware with Owner's Representative.
 - c) A single door to maximum 3'-6" wide unless otherwise approved by Owner.
 - d) Overhead sectional or rolling door, 08300 gives information on Rolling Doors; 08360 gives information on overhead doors. Confirm with Owner's Representative and Fire Marshall.
 - e) Where possible, specify fire doors rated without astragals to avoid the use of coordinators.
6. Specify submissions of complete door and frame schedule showing door numbers, sizes, handing, etc. for approval.
7. Emphasize in specification that doors and/or frames which are not manufactured to specified size and planar tolerances shall be removed from the site and replaced without charge to the Owner.

8. Emphasize in specification that frames that are not installed within specified plumb, level and planar tolerances shall be re-installed or removed from the site and replaced without charge to the Owner.

B. Interior Doors and Frames

1. General

- a) Avoid vision panels and hardware visible on face of inactive leaves of pairs of doors that have manual or self-latching flush bolts.
- b) Consider the use of magnetic hold open devices at fire rated doors when appropriate.
- c) Provide direct access to service spaces from major circulation corridors.
- d) Prefer swinging doors only.
- e) Specify heavy duty hardware.

C. Exterior Doors and Frames

1. General

- a) Hinge doors on windward jamb whenever possible to minimize damage by wind.
- b) Provide doors with full insulation, panic devices, closers, full weatherstrip, and where no overhang exists, drips at head and sweep.
- c) Provide penthouse doors and roof hatches with full insulation and weatherstrip.
- d) Provide selected entrance doors with power door operators for access by persons with disabilities. Specify Horton 4000 series door operator (4100LE Heavy Duty) for heavy duty areas and Horton 7000 (7100 LE Medium Duty) for light duty situations, no substitutions.
- e) Consider using fiberglass doors in areas where salt could deteriorate doors.

08 11 00 METAL DOORS AND FRAMES

B. Steel Doors

1. Joints welded, filled and ground smooth (seamless style).
2. Factory installed reinforcing and preparation for mortised hardware.
3. Reinforcing

- a) Minimum 10 gauge steel or equivalent thread depth for hinges.
 - b) Minimum 12 gauge steel for lock front, closers, and overhead hold open/stop arms.
 - c) Minimum 14 gauge steel for other hardware.
4. Prefer 3'-0" x 7'-0" x 1-3/4" size.
 5. 6" minimum stile, head and center rail depth; 10" minimum bottom rail depth (7" minimum head rail required when using parallel mount closers).
 6. Factory corrosion resistant primed.
 7. Provide steel closure at top and bottom of doors.

C. Steel Frames

1. Joints welded and ground smooth.
2. Factory installed reinforcing and preparation for mortised hardware.
3. Reinforcing:
 - a) Minimum 7 gauge steel or equivalent thread depth for hinges.
 - b) Minimum 12 gauge steel for closers and overhead hold-open/stop arms.
 - c) Minimum 14 gauge steel strikes and other hardware.
4. If grouted, coat interior of frames with bituminous coating approved by manufacturer.

D. Exterior Doors and Frames

1. Doors – Exterior
 - a) Steel Doors
 - 1) Minimum 16 gauge G60 galvanized (no wipe coat) and factory primed. Require letter from manufacturer that doors are galvanized as specified.
 - 2) Bottom provided with weep holes or equivalent.
2. Frames – Exterior
 - a) Steel Frames
 - 1) Minimum 14 gauge G60 galvanized (no wipe coat) and factory primed. Require letter from manufacturer that frames are galvanized as specified.

- 2) Use extra reinforcement or use structural steel sections at dock areas.

D. Interior Doors and Frames

1. Doors – Interior

a) Steel Doors

- 1) Minimum 18-gauge.
- 2) Minimum 16-gauge and reinforced as required for doors over 3'-0" x 7'-0" with high frequency use or subject to occasional impact.
- 3) G60 galvanized (no wipe coat) and factory primed in very moist or corrosive environments. Require letter from manufacturer that frames are galvanized as specified before delivery. Specify high performance field applied coating.

2. Frames – Interior

a) Steel Frames

- 1) Minimum 16-gauge
- 2) Minimum 14-gauge for doors over 3'-0" x 7'-0" with high frequency use or subject to occasional impact.
- 3) G-60 galvanized (no wipe coat) and factory primed in very moist or corrosive environments. Specify high performance field applied coating.
- 4) Fully welded frames preferred.

08 14 00 – WOOD DOORS

A. Wood Doors

1. 6" minimum stile, head and standard center rail depth, 11" minimum bottom rail depth for panel doors.
2. Prefer 3'-0" x 7'-0" size.
3. 1-3/4" minimum thickness.
4. Five ply hardwood veneer faced with hardwood edges and transparent finished. Veneer shall be sliced and applied with matching grains ran vertically and balanced. Preferred Manufacturers:
 - a) Graham Premium Wood Doors, Marshfield-Algoma Signature Series, or equivalent by VT Industries Wood Doors.

5. Five ply wood stave core construction also acceptable.
6. Wood fire doors of 1 hour or more fire rating may be used only if normally held open magnetically or used in locations of very infrequent use. In these cases, specify with top rail and lock block options.
7. Specify lifetime warranty.
8. May be plastic laminate faced if five year warranty against delamination is obtained.

B. Wood Frames

1. May be used in remodeling projects to match existing design. Discuss with Owner's Representative.

08 30 00 – SPECIALTY DOORS AND FRAMES

A. Rolling Counter Doors

1. May be steel, aluminum or wood if installed in non-fire rated wall.
2. Where use in fire rated partitions, doors must be steel and have the following features:
 - a) Smoke and draft gaskets.
 - b) Labeled door and frame.
 - c) Fusible links both sides of wall that release door when melted.
 - d) Release mechanism controlled by smoke detection system that releases door when in alarm. Adjustable delayed release preferred.
 - e) Controlled door descent when released by (2c) and (2d) above.
 - f) Easily tested and reset by maintenance personnel.
3. Counterbalanced manual operation preferred for smaller sizes and with easy access to the door.
4. Power or crank operation preferred for larger sizes or with difficult access to the door.

B. Coiling Doors/Fire Curtains (Roll Up Metal Doors)

1. The use of this type door is strongly discouraged, and only by specific permission of the Owner's Representative.

08 31 00 – ACCESS DOORS

A. General

1. Access door sizes and details shall conform to industry stock standards whenever possible. When locking of units is required, conform to Owner's master lock system utilizing Best-Access Systems, 7 pin lock core system. Supply cores to Owner for keying and installation. Doors and frames will be rated the same as the framing system that it is being installed in. Doors shall be furnished by a single manufacturer if possible.
2. The following table of manufacturers is considered equal.

Larsen's Manufacturing Co., The Bilco Company, J.L. Industries, Milcor

3. Access Doors – Walls and Ceilings – Frames shall be 16-gage steel. Doors are 20-gage steel with latch lock and 175 degree hinge. Units shall be factory primed. Typical minimum sizes are 14" x 14" for walls and for ceilings.
4. Access Doors – Floors – Frames shall be 14-gage aluminum. Doors are 11-gage aluminum recessed for finish flooring materials. Doors shall also have 165-degree hinges and hold open arm. Units shall be mill finished. Typical size is 30" x 30" minimum.

08 36 00 – PANEL DOORS

A. General

1. Door sizes and details shall conform to industry stock standards whenever possible. Custom sizes and details shall only be used to match existing conditions or facility needs. Supply two keys for locks that are master keyed to Owner's Best Lock Corp. 7 pin system. Check with Owner's Representative for selection of manual or power operated doors.
2. Provide overhead doors with motorized operators, full insulation and weatherstrip.
3. The following table of manufacturers is considered equal.

C.H.I. Overhead Doors
Overhead Door Company
Raynor Garage Doors

4. Overhead Doors – Track shall be 2" wide, 0.09" thick galvanized steel minimum. Steel doors are R-12 insulated, nominal 2" thick, 20 gage outer face, 26 gage inner face, and pre-finished baked enamel. Standard color to be selected.

08 40 00 – ENTRANCES, STOREFRONTS AND WINDOW WALLS

A. Aluminum Doors

1. 6" minimum stile, head and center rail depth; 12" minimum bottom rail depth.

2. 3'-0" x 7'0" maximum size, unless approved by Owner's Representative.
3. 1-3/4" minimum thickness.
4. Specify all welded joints or mechanical joints held in compression by full width steel tie rods.
5. Full glass light not recommended. Divide with wide enough center rail so panic hardware is hidden.
6. Anodized or high performance coating.
7. Fully seated joints, except at bottom.
8. All window wall construction shall be set on top of a concrete curb or framed wall curb. Do not set onto floor grade but a minimum of 8" above floor level to allow for proper flashings.

B. Aluminum Frames

1. 2" minimum face x 4-1/2" minimum depth.
2. Internally steel reinforced around door openings.
3. Anodized or high performance coating.
4. Thermal break design.

08 50 00 – WINDOWS

A. General

1. Specify window supplier to provide all required window hardware and screens.
2. Insulbar or similar thermal barrier systems required.
3. Specify 50% PVDF Kynar finishes with 20 year warranty, when appropriate.
4. Specify obscure or translucent glazing where appropriate.
5. Specify security screens where appropriate.
 - a) Include all grade level windows on residence halls. Stainless steel preferred.
6. Specify windows to have factory installed weatherstrip.
7. Specify minimum of 1" insulating glass – 3/16" low E coated exterior glass, 5/8" air space and 3/16" clear interior glass.

8. On operable windows provide pivoted sash to enable cleaning of both sides of glass from inside of building.
9. Provide insulation at heads, jambs, and sills.
10. At exterior, provide caulk to match grout joints. All caulk to have a minimum life expectancy of 35 years.
11. If silicon caulking is used it shall not be painted.
12. Design to permit easy access for maintenance and repair.
13. Window flashing at the sill pan to wrap up vertically at the inside face of the window.
14. Specify air and water testing requirements. A minimum of three (3) new windows are to be tested after 1st third installed. Tests shall include:
 - a) Air infiltration
 - b) Water resistance
 - c) Uniform load structural test
 - d) Uniform deflection test
 - e) Life-Cycle testing
 - f) Thermal transmittance test
15. Testing will be hired by Owner, when applicable. Contractor to provide a lift and operator as needed to access windows for the owner provided testing company.

B. Material and Finish

1. Aluminum or clad wood acceptable, confirm with Owner's Representative.
2. Vinyl clad windows are preferred over aluminium clad wood windows.
3. Aluminum should be anodized or have high performance coating and be a minimum of .08 thick.
4. Fiberglass also acceptable, confirm with Owner's representative.

08 60 00 – SKYLIGHTS

- A. Skylights will only be permitted under special conditions approved in advance by the Owner's Representative.
- B. Provide roof fall protection around skylights per OSHA requirements.

08 70 00 – HARDWARE

A. General

1. General

- a) Determine requirements of door hardware and keying with users and Owner's Representative during Design Development.
- b) Specify submissions of complete hardware schedules.
- c) Specify that hardware supplier provide templates to door and frame suppliers.
- d) Specify only one manufacturer for each type of hardware.
- e) Specify only products made in the USA, rated for heavy use.
- f) It is preferred that the consultant shall prepare hardware specifications with the assistance of a certified Architectural Hardware Consultant (AHC).
- g) Preferred finish for all hardware shall be US26D, unless matching existing conditions. Use US10 finish, satin bronze, as alternate where appropriate. Verify with Owner.
- h) Specify submission of complete hardware schedule showing door numbers, sizes, handing, product data sheets, mounting heights, finish, wiring diagrams, etc. for approval. Hardware samples to be supplied upon Owner's request.
- i) Use of self tapping screws and power driven tools are prohibited except on door closers. Threaded screws or bolts shall be used at all other locations.

2. Door Contacts

Locate all door position switches on top of door and recessed in the top door frame rail between 3"-6" of the latch side of the frame. Do not locate door contacts in the vertical section unless Schlage 300/400 lockset.

3. Hinges – General

- a) Must be stainless steel, ball bearing 4 ½" x 4 ½" hinges for all interior and exterior doors.
- b) Specify heavy weight concealed bearing for high frequency use and standard weight concealed bearing for medium and low frequency use.
- c) Specify flat style pins that are non-removable for exterior and interior doors that swing out; otherwise specify non-rising pins.
- d) Specify hinge to require no maintenance or lubrication.

- e) Specify hinge guaranteed for life of building if installed per manufacturer's recommendations.
- f) Specify mortise hinges, typically 4 ½" x 4 ½" with 3 butts per leaf.
- g) Specify minimum 4 butts per leaf for any door leaf over 3'-0" x 7'-0".
- h) The following manufacturers and types are considered equal:
 - Haggar BB 1199
 - Or Owner approved equivalent
- i) Continuous geared hinges are NOT preferred. Please consult Facilities Management, Facilities Access and Maintenance Coordinator if considering this option. Consider non-ferrous stainless steel or aluminum continuous geared hinges on high usage doors. The following manufacturers and types are considered equal (based on a 36" x 84" door):
 - McKinney – (HD) Heavy Duty
 - Pemko – (HD) Heavy Duty
 - Select – (HD) Heavy Duty
 - Hager - (HD) Heavy Duty
- j) Pivot hinges not allowed.

3. Panic Devices – General - Provide rim mounted panic devices on all exterior doors.

- a) Specify Von Duprin 99 series rim mounted devices.
- b) Avoid vertical rod devices wherever possible, enclosed or surface mounted, must be approved by Owner. If approved, vertical rod must have a through bolts at the top and bottom. Interior doors, surface mounted, vertical rod, but top rod only. Exit device should be bolted.
- c) Vertical cable system is preferred over a vertical rod system.

4. Locksets and Latchsets General

- a) New construction
 - 1) Best Lock Corp. ~~45H 40H~~ – Lever, full mortise lever locks with #15 style lever, Rose H. Core type shall be Best Lock Corp. brand, 7 pin.
 - 2) For high security areas consult with Owner's Representative.
- b) Remodeling, match existing series and finish where possible.
- c) Design Consultant to verify desired hardware functions and keying requirements with users and discuss with Owner's Representative.

- d) Provide lever handles to all spaces accessible to persons with disabilities. Knurl lever handles on doors to areas potentially hazardous to a person with impaired vision.
- e) For non-latching push or pull doors, must be straight pulls, not offset. Pull and push plates, shall be straight with no offset, 1 ¼ inch diameter, 2 ½ inch have clearance between back of pull and face of door, needed to be fastened with a 3/8 inch diameter through bolts.
- f) Provide 5 year minimum warranty on locksets.

5. Closers – General

- a) Specify LCN 4040XP ~~4044~~ Series closers.
- b) Regular and top jam mounting preferred over parallel mounting.
- c) Instead of using floor stops, parallel mounting preferred to provide stop function.
- d) Wall mounted magnetic hold-open devices preferred over integral close-holders where possible.
- e) LCN Sentronic single-point and multi-point integral closer-holders preferred.
- f) Do not use integrated smoke detector/closer-holder units.
- g) Attach closers to wood doors with through sex bolts.
- h) Minimum of a 10 year warranty.
- i) Follow ADA guidelines for door closing speed.

6. Power Door Openers – General

- a) Where maximum durability is required for very high frequency operation, specify Horton 7000 series (4100LE Heavy Duty) for slow opening operator. For light duty areas, specify Horton 7000 (7100LE Medium Duty), no substitutions.
- b) Coordinate with owner for the location of power door operators. Automatic door operators for use on interior doors are discouraged.

7. Kick Plates and Push Plates – General

- a) Use on push side of doors, especially wood doors.
- b) Stainless steel is preferred with beveled edges.

- c) Specify kick plates 16" high x width of door less 2 inches, mounted flush with bottom of door.
 - d) Burns Mfg. preferred.
8. Flush Bolts – General
- a) H.B. Ives Co. Model 262 flush bolts preferred.
9. Stops – General
- a) Do not use floor stops except as specifically required by manufacturer of magnetic hold-opens, closer holders, overhead holder-stops and overhead stops.
 - b) Wall bumpers are preferred over any other type of stops.
 - c) Provide solid anchorage and reinforced backup framing in hollow walls for wall bumpers.
 - d) Burns Mfg., Glynn Johnson Corp, or H.B. Ives Co. preferred.
10. Cylinders – General
- a) Cylinders and mortise locks shall be Best Access Systems brand 45H Series with lever 15H. Core type shall be Best Access Systems brand 7 pin. An extra 5% of cores shall be provided to the Owner for spares with a minimum of one (1) extra core per project. Final keying shall be by Owner. Design Professional responsible to ensure the correct hardware is selected as specified.
 - b) Cylinders shall be shipped to Constructor with construction cores. Final cores shall be shipped to Owner.
11. Keying – General
- a) Specify Best Access Systems. 7 pin restricted section master keyed system. UNI's Best keying is divided into thirteen major areas, with key quantities determined for each project.
 - b) Determine keying requirements from users by in-house staff.
 - c) Allow Owner's Representative a minimum of 60 working days before construction document completion to develop keying instruction and related hardware information required for specifications.
 - d) Owner shall cut keys, pin, and install cylinders.
 - e) Specify that Best Lock send uncombined cores and uncut keys to correspond, correctly stamped by Best "**KS305**", by registered mail direct to Owner's Representative, with notice of such action to hardware supplier.

- f) Specify core and key blank quantity and section in hardware specifications.

12. Hardware Locations – General

a) Remodeling Existing Buildings

- 1) Match existing locations except when current codes dictate otherwise.
- 2) State specific locations of existing hardware, such as "...centerline 36 inches above finished floor," instead of using a general phrase such as "match existing," or "per code".

B. Exterior

1. Panic Devices

- a) Specify VonDuprin 990 trim with #696 or #697 exterior pull when device not required to latch when unlocked.
- b) Specify VonDuprin 990 trim with #03 or #17 breakaway lever handle when device required to latch when unlocked.
- c) Installation: Use of self-tapping screws is prohibited on all locksets, panic devices, door closers/ADA operators, etc. Use threaded machine screws or through bolts. No power driven tools shall be used for installation of locksets and hardware on doors.

2. Weatherstrip

a) Head and Jamb

- 1) Prefer small angled brush type with recessed screws. Second choice is high performance polyurethane bulb (jamb up) type with screws recessed to avoid snagging skin or clothing.
- 2) Specify National Guard Products, Inc., Pemco Mfg., or Reese Enterprises.

b) Sweeps and Astragals

- 1) Prefer straight brush type.
- 2) Specify National Guard Products, Inc., Pemco Mfg., or Reese Enterprises.

3. Thresholds

- a) Specify maximum ½ inch high, flat saddle style to meet ADA requirements.
- b) Specify National Guard Products, Inc., Pemco Mfg. or Reese Enterprises.

4. Drips

- a) Specify at non-weather protected entrances.
- b) Specify Reese or approved equal at head frame locations.
- c) Specify Reese or approved equal at door sweep locations.

C. Interior

1. Smoke Seals

- a) Prefer high performance polyurethane bulb (jamb up) type with screws recessed to avoid snagging skin or clothing. Specify National Guard Products, Pemco Mfg., or Reese Enterprises, black finish.

2. Door Bottoms

- a) Avoid automatic door bottoms except for very low frequency use door and soundproof doors. Prefer alternative solution using low threshold and sweep where possible.

D. Electronic Access System -See Division 28

08 80 00 – GLASS AND GLAZING

A. General

- 1. Specify a minimum of 10-year warranty for workmanship and material.
- 2. The following table of manufacturers is considered equal.

AFG Industries, Inc.	LOF Glass, Inc.
Ford Glass Division	PPG Industries, Inc.
Guardian Industries Corp.	Viracon, Inc.

- 3. Clear Float Glass – ¼” thick, clear, annealed.
- 4. Safety Glass – ¼” thick, clear fully tempered.
- 5. Safety Opaque Glass – Minimum ¼” thick, float type, heat strengthened, sandblasted to provide opaque finish.
- 6. Clear Low E Glass – ¼” thick, clear, float type, annealed, coating on inner surface.
- 7. Spandrel Glass – ¼” thick, clear, heat strengthened, ceramic fused frit of gray color on back surface.
- 8. Laminated Glass – 3/8” thick, clear, heat strengthened or tempered as required.
- 9. Insulated Glass – Total unit thickness of 1”, clear, double pane with elastomer edge

seal, place low E coating within the unit, purge interpane space with dry hermetic air.

10. Insulated Spandrel Glass – Total unit thickness of 1”, clear, heat strengthened, ceramic fused frit of gray color on back surface, double pane with elastomer edge seal, place low E coating within the unit, purge interpane space with dry hermetic air.

B. Windows, transoms and sidelight. (Exterior)

1. Windows shall be double-glazed, with low E glass.
2. Prefer transoms to be safety glazed.
3. Consider thick laminated glass where increased security is desired.
4. Discuss reflective or tinted glass or use of exterior shading devices with the Owner’s Design Representative where those features may be desirable.
5. Prefer that all glass sizes and openings be 48” x 48” or smaller.
6. No wet glazed window assemblies shall be allowed for usage on any window units specified.

C. Clerestory windows and skylights. (Exterior)

1. Normally double-glazed with low-E glass.
2. Clerestory windows preferred over skylights.
3. Avoid curved glazing.
4. Avoid plastic glazing.
5. Design to permit easy access for maintenance and repair.
6. Provide roof fall protection around skylights per OSHA requirements.
7. Confirm with Owner’s Representative the amount of light transmittance desired when selecting the glazing.

D. Door Vision Panels

1. Provide safety glass in non-fire rated doors.
2. Provide fire rated glass in fire rated doors.
3. Preferred clear opening size for 1 hour and 1-1/2 hour labeled door is 4” x 24” or 25”.

08 83 00 - MIRRORS

1. Locate bottom no higher than 40 inches above the floor for use by persons in wheelchairs.
2. Specify vandal resistant concealed mounting.
3. Mirror – ¼” thick, clear, heat strengthened, Glass with full silver coating, copper coating, and organic coating, polished edges, stainless steel J-channel trim.