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DATE: September 21, 2009

FROM: Ian Salada

REC'D SEP 21 2009

TO: Telecommunications & Software Support

RE: Design and Construction Standards Update

Completed
SEP 21 2009

DIVISION(S): 08

SECTION(S): 08 00 01, 08 10 00, 08 50 00, 08 80 00

☐ Minor change to correct format problem or typographical errors
No entry in the revision log required

☑ Revision Log Entry Required

Description of Change: Updates to window and glazing standards

☑ Copy of changes sent via email also
clh291
cal9

Modify Division 08 per the following (deletions are shown struck through and additions are double underlined).

08 00 00 DOORS, WINDOWS, GLASS, AND HARDWARE

08 00 01 Owners General Requirements and Design Intent

.01 General:

A. Safety Glazing

1. Comply with all building code requirements.
2. Also see, Div 01 05 05 Space Planning, .01 Safety Considerations

B. Visual

1. Refer to Division 01 83 00, Facility Shell Performance Requirements for daylighting and glare control.
2. Glazing systems shall be selected with spectrally selective coatings to filter damaging UV wavelengths in order to increase the life of interior furnishings.
3. Renovations to historic buildings shall require special window detailing. Professional shall select and specify companies offering high-performance products that can provide the desired appearance, fitting with the period and style of the historic building, while maintaining energy efficiency.

C. Moisture Protection

1. Select glazing and frame thermal performance to avoid condensation problems. Higher performance glazing assemblies are required in higher indoor moisture applications such as indoor pools, food preparation, or certain research facilities.
2. Design shall be integrated with building envelope to include careful construction detailing to maintain the continuity of exterior moisture, air infiltration and interior vapor barriers at the perimeter of doors, windows and glazed wall assemblies.

D. Energy and Thermal Comfort:

1. Refer to Division 01 83 00, Facility Shell Performance Requirements for integrated design criteria of fenestration assemblies within building envelope to optimize energy and thermal comfort performance.

E. Sound (Acoustics)

1. Select and specify door and window units with adequate Outdoor—Indoor Transmission class rating to maintain indoor noise levels within allowable ranges.
    a. Include careful construction detailing to maintain continuity of sound transmission rating of entire wall/fenestration assembly.

F. Performance Longevity and Sustainability

1. Insulated glass units shall conform to ASTM E-2190 *Standard Specification for Insulating Glass Unit Performance and Evaluation* and be certified and labeled accordingly.
2. Insulated glass units shall be glazed in accordance to Insulating Glass Manufacturers Alliance (IGMA) standards
3. Designer shall select and specify insulated glass units with unit construction details that will ensure (guarantee) the longest service life when comparing major cost competitive manufacturers. This is to minimize life cycle costs and long term landfill waste stream. Insulated glass units are not typically recycled.

G. Maintainability and Repairability

1. Window units shall allow for easy repair and replacement of flexible seals between glazing units and framing since these seals must be replaced periodically to maintain effectiveness.

08 10 00 DOORS AND FRAMES

.01 Exterior Door Frames

A. Exterior door frames shall be heavy duty (14 ga.), hot-dipped galvanized metal, or aluminum.

B. Aluminum shall be anodized in selected finish.

C. Door frames shall have concealed reinforcement plates for the attachment of all hardware.

D. All exterior frames shall be weather stripped.

.02 Exterior Doors

A. All exterior doors should be of metal, heavy duty (16 ga.), galvanized, and seamless construction.

B. Aluminum doors shall be anodized in selected finish.

C. Narrow stile type metal doors are not acceptable. Stiles and top rail shall be a minimum of five (5) inches and bottom rail shall be a minimum of ten (10) inches.

D. Automatic hold-open devices are not permitted on exterior doors.

E. Use of single doors or multiple doors with mullions is preferred.

F. Comply with Div 01 05 05 Space Planning, .01 Safety Considerations.
~~NOTE: See General Notes to the Professional, Paragraph E.2.~~

.03 Interior Doors – Wood

A. Specifications for interior doors of wood shall be adapted from standards of the following manufacturers: Doors to be 1 3/4" thick ~~solid~~ agri-fiber core, flush.

1. Algoma Hardwoods

2. Weyerhauser

B. It is preferred that wood doors be prefitted and prepared for approved hardware at the place of manufacture.

C. It is preferred that wood doors be prefinished for natural finishes and presealed for doors to receive paint.

D. Doors from corridors to stairwells and classrooms shall have a vision panel.

E. All cut-outs for vision panels, louvers and similar items shall be accomplished at the factory. Manufacturers shall provide reinforcement members (if required), prefitted, prefinished mouldings, trim and all glazing beads.

F. Provide ~~mullion~~ removable astragal for all multiple door openings.

G. Louvers, if required, shall be provided by the door manufacturer.

08 50 00 WINDOWS

.01 Windows (All Vertical Glazed Assemblies)

A. All sash and frames are to be nonferrous, ~~anodized~~ extruded aluminum in corrosion resistant, protective ~~selected~~ finish of type and color approved by University, with complete thermal barrier construction. If operable, using sliding, projected, or hopper with integral weather stripping; no outward projecting sash will be permitted on the ground floor. ~~Windows shall be double glazed Anodized aluminum to be treated to prevent etching from aluminum residue.~~
   1. Wood windows with extruded aluminum clad exterior may be considered for non-institutional, non-commercial, non-student housing, individual or multi-family residential applications.

2. Vinyl clad wood or frames/sash constructed of extruded vinyl are not permitted.

B. For maintenance purposes, all windows should be arranged, manufactured, and installed, so that complete maintenance can be accomplished from the room side. This should include glazing, washing, screening, and normal repairs.

C. Windows with fixed sash should be designed to allow the "fixed" sash to be operable only for cleaning and maintenance; i.e., utilize side pivoted or tilting type sash at normally "fixed" sash locations in high-rise buildings.

D. Consideration should be given to the use of ~~tinted~~ spectrally selective glass and/or~~or~~ special external shading ~~structural~~ design at certain areas where orientation will lead to excessive solar heat gain.

~~NOTE: See General Notes to the Professional, Paragraphs E.3 and E.4.~~

E. Comply with Div 01 05 05 Space Planning, .01 Safety Considerations.

~~E~~F. Performance Criteria: All glazing assemblies shall be certified by the National Fenestration Rating Council (NFRC). Energy performance values (U-value and SHGF) shall always be specified to be certified for the whole assembly, not merely the center of glass.

1. Refer to Glazing section below for further detail.
~~1.~~2. Permanently unconditioned spaces shall not require insulated glass, high performance glazing.

08 70 00 HARDWARE

.01 Finish Hardware Requirements

A. Office Doors:

Locksets and trim shall be similar to Sargent #8205 WTJ. No door closers, unless required by codes.

OPERATION: Latch bolt operated by lever either side except when outside lever is locked by button or toggle in faceplate; latch is retracted by key outside. Auxiliary bolt deadlocks latch.

B. Classroom Doors:

1. Locksets and trim shall be “CLASSROOM FUNCTION:”

a. Guardbolt deadlocks latchbolt

b. Latchbolt retracted by either trim unless outside trim is locked by key

c. Key outside locks or unlocks outside trim

d. Inside trim always operative

e. Latchbolt can be retracted by key in locked position

f. Handles to be break-away levers except where Codes requires panic bars

2. Closers shall be LCN, or equal, type 4010 or 4110 series allowing 180 degrees of swing where conditions permit

3. Inactive leaf of double doors shall have mortise flush bolts head and foot similar to IVES #457 x dustproof strikes

4. See Division 13 20 10 for further references to the General Purpose Classroom document that includes information on doors and hardware in that document.

C. Laboratory Doors:

Locksets and trim shall be similar to Sargent #8225 WTJ.

Closers shall be LCN, or equal, type #4010 or 4110 series allowing 180 degrees of swing where conditions permit.

Inactive leaf of double doors shall have mortise flush bolts head and foot similar to IVES #457 x dustproof strikes.

OPERATION: Latch bolt by lever either side. Dead bolt by key outside and turn piece inside. When dead bolt is projected, latch bolt is deadlocked and outside lever is locked. Turning inside lever retracts latch and dead bolt simultaneously—automatically unlocking outside lever.

D. Storage Room Doors:

Locksets and trim shall be similar to Sargent #8224 WTJ. No door closer, unless required by codes.

OPERATION: Latch bolt by lever either side. Dead bolt by key outside and turn piece inside.

E. Janitor Closet, Janitor Storage, and Utility Room Doors:

Locksets and trim shall be similar to Sargent #8204 WTJ. No door closers, unless required by codes.

OPERATION: Latch by lever inside and key outside. Outside lever always rigid. Auxiliary latch deadlocks latch bolt.

F. Public Toilet Doors:

Each door shall have pulls similar to Rockwood #FB110-70B and 18-gauge stainless steel push plates. Closer shall be LCN or equal, type 4010 or 4110 series. Provide Glynn-Johnson GJ 45 kickdown door holder if permitted by applicable code.

OPERATION: Push and pull. Use latch set where required by codes. Latch bolt retracted by either lever.

G. Communicating Doors:

Locksets and trim shall be similar to Sargent #8226 WTJ. No door closers, unless required by codes.

OPERATION: Latch both by lever either side. Dead bolt operated from either side by key.

H. Stair Tower Doors:

Exit devices and trim shall be similar to Von Duprin #99L-F-BE x #992L-R-03 for single doors or #9927EO-F x #9927L-F-BE x #992L-V-03 for double doors. Should be surface-type exit devices. Closers shall be LCN, or equal, type 4010 or 4110 series without holder arms.

OPERATION: Latch automatically when closed. Latch bolt by lever outside and touchbar inside. No dogging.

I. Exterior Doors (including aluminum doors):

Exit devices and trim shall be similar to Von Duprin #33NLx333NL for single doors or double doors with removable mullions, or #3327DT x 333DT x 3327NL x 333NL for double doors. Should be surface-type exit devices.

Closers shall be LCN, or equal, type 4010 or 4110 series without holder arm. Doors shall have substantial holders and bumpers to manually **hook** doors in open position.

OPERATION: Lock automatically when closed--key retracts latch bolt. When touchbars are locked down by Allen-type dogging key, latch bolt is retracted and doors operate push-pull.

J. Vestibule Doors (including aluminum doors):

Each door shall have pulls and push bars similar to the exterior doors. Closers shall be LCN, or equal, type 4010 or 4110 series without holder arm. Doors shall have substantial holders and bumper to manually **hook** doors in open position.

OPERATION: Push and pull.

K. Dormitory Bedroom Doors:

Locksets and trim shall be similar to Sargent #8225 WTJ.

Closers shall be LCN, or equal, type 4010 or 4110 series.

Kick plates and mop plates shall be 18 gauge stainless steel beveled top and two (2) sides.

OPERATION: Latch bolt by lever either side. Dead bolt by key outside and turn piece inside. When dead bolt is projected, latch bolt is deadlocked and outside lever is locked. Turning inside lever retracts latch and dead bolt simultaneously—automatically unlocking outside lever.

L. Uncontrolled Library Exit Doors:

All doors shall be equipped in conjunction with the exterior door hardware with an emergency exit alarm similar to Detex EA-2500 series exit alarm. The emergency exit alarm locks may be key operated from the inside or outside or both as directed by the University and Architect.

M. Lock Cylinders:

All cylinders shall be (7) pin removable core type as manufactured by Best Lock Corporation, keyed and masterkeyed according to schedules which will be prepared by the University - Office of Physical Plant. Furnish two (2) keys with each cylinder and three (3) master keys.

All keys shall be embossed with the letters "P.S.U." and stamped "DO NOT DUPLICATE" and the door number or other symbol as directed.

The Contractor shall use construction cores furnished by the lock company and return same when the permanent cores are installed.

All key-operated elevator switches to be provided with Best cylinders only. All Best cylinders shall be specified under the Finish Hardware Section.

N. Hinges:

All doors shall be equipped with proper type, size, and number of hinges as recommended by Stanley or McKinny Hinge Division. All hinges shall have button tips and non-removable pins for exterior doors opening out.

O. Door Stops, Holders and Bumpers:

All doors shall be provided with stops similar to Glynn Johnson GJ-WB-50C where possible. Where required, floor stops shall be similar to GJ-FB-13 or GJ-FB-17, overhead stops and holders GJ-90 series and holders and bumpers GJ-F9X, F20, or GJ-W-20.

Do not specify automatic holders for exterior doors.

P. Finishes:

All hardware shall be satin chrome (US26D), except pulls, push plates, kick plates and mop plates shall be satin-finish stainless steel (US32D), unless otherwise specified.

Q. Miscellaneous Requirements:

All push plates where possible shall be 8" x 16" in size.

All doors with push plates and pulls with the cylinder on the push side shall have recessed pulls similar to Rockwood #94C used in conjunction with the push plates.

Provide rubber silencers, similar to GJ-64 for all doors in hollow metal frames, except exterior doors.

Supply padlock (if required) with Best (7) pin core keyed to building master.

Furnish padlocks for all transformer gates.

All doors with closers shall be provided with kick plates.

All door closers for wood doors to be furnished with thru bolts and grommet nuts.

All doors as specified shall have surface-mounted overhead closers, full rack and pinion type, with back check, as manufactured by LCN or equal.

Exterior or vestibule doors where conditions would be better suited for floor closers, use Rixson #27 series or equal including an intermediate pivot.

All flush bolts to be installed in edge of doors.

Non-metallic insert type latch bolts will not be acceptable as antifriction unless used with
curved lip strike.

"Total Door System" hardware is not acceptable.

All hardware for aluminum doors shall be specified under the finish hardware section.

No automatic hold-open devices permitted on exterior or vestibule doors.

Hardware schedules shall be done in the vertical format type. Horizontal format will not be accepted.

For locksets with lever handle, trim design shall be similar to Corbin-Russwin LSM or Sargent WTJ.

All hardware must be in accordance with the latest requirements of all applicable codes.

08 80 00 GLAZING

.01 Glass and Glazing

A. Windows ~~are to be double glazed,~~with flush-type moulding preferred.
B. Glazing, glazing compounds and sealants. (1) Refer to manufacturer's requirements and Flat Glass Jobbers Association (FGJA) "Glazing Manual" for special applications using elastic compounds, tape, polysulfide elastomer sealants, and compression materials.
C. All glass and glazing shall be in compliance with applicable codes.

D. Incorporating Insulated, High Performance, Spectrally Selective Glazing into the envelope design is required. Professionals shall analyze and optimize the following performance factors of the windowglazing systems:

1. Thermal (U-value)
    a. Select the U-value to minimize energy loss through the envelope and to maintain relatively high internal surface temperature in winter in order to provide thermal comfort condition requirements (allowable radiant temperature asymmetry, MRT, per ASHRAE Standard 55 – 2004 or current). These values supercede Energy Code or ASHRAE 90.1 minimum requirements.
        i. In residential, office, classroom or similar spaces in which sedentary occupants will be located close to glazed areas, the glazed assembly U-value shall not exceed three times the opaque wall assembly or 0.20 (whichever is more stringent).
        ii. In transient spaces, U-values and internal surface temperatures are not as critical for human comfort but reducing heat loss in cold climates is still important. In these locations, the U-value shall not exceed 0.35 or 30% less than the maximum U-value prescribed by current Energy Code/ASHRAE 90.1, (whichever is more stringent).

2. Solar (solar heat gain coefficient – SHGC)
    a. Windows (vision glazing) with low SHGC values (0.25-0.35) shall be used on all West, East and South facing walls.
    b. If the project specifically intends to use passive solar heating, south facing windows glazing shall have a high SHGC coupled with exterior shading devices.

3. Daylighting (visible light transmittance – VLT)
    a. Select VLT for most effective utilization of daylighting, balanced with need for glare control.
    b. In general, window areas above 7'6" are considered to be daylight glazing. Use high VLTs (0.50-0.70) in these areas. Window areas between 2'6" and 7'6' are considered vision glazing. Use VLT's in the range of 0.35-0.50 to achieve recommended lower SHGF values in these areas.
        1) Exceptions: Lower VLT's may be required to prevent glare, especially on the east or west facades, low sun angles, or for higher window-wall ratios, or light-colored, highly reflective adjacent exterior horizontal surfaces.

4. Tint and Coatings
    a. If selective coatings are included in design, ensure the coating is fully and properly specified for each specific perimeter orientation or application.

E. Manufacturers:
    a. Southwall Technologies - http://www.southwall.com/southwall/Home/Commercial/Products/HeatMirrorInsulatingGlass.html

b. Or equivalent in performance

END of revisions

Update Commentary:

Section was updated primarily for the following reasons:

1) To develop and document General Owner Requirements in order to define basic design intent and selection criteria.
2) To update the Product Requirements for the technical details of doors and windows in order to optimize window / glazing performance and achieve better, more serviceable windows and doors.
3) Note the following special points:
    a. Coordination with Division 01 83 00, Facility Shell Performance Requirements for integrated design criteria of fenestration assemblies within building envelope to optimize energy and thermal comfort performance
    b. Thermal performance requirements more stringent than Energy Code.