Jefferson County School District, R-1
Support Services

TECHNICAL GUIDELINES

DIVISION 08 – OPENINGS

AUGUST 2022

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DIVISION 08 – OPENINGS

08 11 00 Metal Doors and Frames – August 2019

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Standard types and sizes are preferred.
  1. Leaf width:
     a. 36 inches minimum
     b. 42 inches maximum for ADA accessible doors
     c. 48 inches maximum for non-ADA doors
  2. Height:
     a. 7'-0" preferred
     b. As required for retrofit applications.
- Glazed openings in and around doors
  1. Solid door without lite is preferred to the greatest extent possible
  2. Flush door with sidelite is the preferred configuration at classroom doors
  3. Door vision panel maximum dimensions:
     a. Width = 24 inches
     b. Height = 60 inches
  4. High security openings should be narrow (3 inches or less) or use security glazing..
- In the absence of other information, standards of the following organizations apply:
  1. NFPA 80, Standard for Fire Doors and Fire Windows
  2. Steel Door Institute (SDI)
  3. National Association of Architectural Metal Manufacturers (NAAMM)
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawing:
     a. Required
  3. Door Schedule:
     a. Required
        (1) Including label/fire rating
        (2) Frame anchorage
  4. Closeout:
     a. Submittals listed above
     b. Updated to record status.
- Restrictions
  1. Knock Down (KD) frames:
     a. Permitted for limited retrofit applications only.
  2. Mixing of frames and doors of different metals is prohibited.
  3. Aluminum doors are prohibited in HM steel frames. Use only as part of an aluminum Storefront or Entrance System designed specifically for aluminum doors.
     a. See Section 08 41 00.
  4. Provide architectural protection for exterior doors to prevent wind damage, especially at north and west exposures.

- Steel Frames
  1. Minimum Gauge:
     a. 14 exterior
     b. 16 interior
  2. Construction:
     a. Continuous electric-welded mitered corners
     b. Spot welded elsewhere
  3. Factory reinforced and prepared for attachment of:
     a. Hinge: 3/16 inch x 12 inch steel plate
     b. Strike: 14-gauge steel
     c. Closer: 12-gauge steel
     d. Head over 42-inch width: 14-gauge frame or 12-gauge angle or channel stiffener.
  4. Removable center mullion is required for paired door frames
     a. Interior and exterior
  5. Electrostatic applied epoxy ester shop primer
- Frame anchors
  1. Concrete and Masonry: 14 gauge adjustable strip anchors at least 2 ½ inches x 10 inches; T-strap, wire, or corrugated/perforated stirrup and strap configuration welded to frame
     a. Quantity per SDI
     b. Galvanized and epoxy primed and exterior and wet locations
  2. Metal Stud Framing:
     a. 16 gauge anchors welded to frame
  3. Masonry retrofit:
     a. Countersunk drilled U.L. type masonry anchor
  4. Fixed or adjustable floor anchors are mandatory
- Slush fill hollow metal frame with grout at masonry and concrete construction
- Steel Doors:
  1. Materials
     a. ANSI/SDI-A250 Level 3 Heavy Duty; 16 gauge face except as itemized below.
     b. ANSI/SDI-A250 Level 4 Extra Heavy Duty; 14 gauge face and internal stiffeners are required at the following locations:
        (1) Exterior main entrances
        (2) Gymnasium, Locker Room, Athletic area exterior doors
        (3) Cafeteria, commons exterior doors
        (4) Other exterior high traffic/abuse/security locations identified by Jefferson County School District, R-1
     c. ANSI/SDI-A250 Level 1 Standard Duty; 18-gauge face is permitted for in-room closets.
  2. Construction
     a. Plain flush with edge seams, seamless, or stile and rail construction
     b. 1 3/4 inch overall thickness
     c. 18 gauge top channel
     d. 18 gauge recessed or concave bottom channel.
     e. Mitered, fully welded construction
     f. Factory reinforced and prepared for attachment of:
        (1) Hinge: 3/16 inch steel plate

(2) Lock: 16-gauge steel
(3) Closer: 12 gauge steel

g. Core:
(1) Honeycomb
(a) Kraft paper honeycomb prohibited
(2) Grid
(3) Vertical steel rib
(4) Polystyrene and polyurethane cores are prohibited.

h. Insulation:
(1) 3-lb. mineral or glass wool
(2) Loose or blown fill is prohibited.

i. Finish:
(1) Factory applied air dried or baked rust inhibiting primer

- Installed Clearances - Non-Fire-Rated Assembly:
  1. Head & Jamb: 3/32 inch preferred, 1/8 inch maximum
  2. Meeting stile: 1/8 inch maximum
  3. Bottom at threshold: 1/8 inch preferred, 1/4 inch maximum
  4. Bottom to floor: 1/2 inch maximum
- Field modification or machining of labeled doors is prohibited except as permitted by NFPA 80.
- Glazing stops:
  1. 18 gauge mitered & welded steel channel.
  2. Screw attachment only.

END SECTION 08 11 00

08 14 00 Wood Doors – August 2015

- Work in this section is restricted to specific manufacturers that have been previously approved by Jefferson County School District, R-1 Facilities Management, and that meet the requirements of this Section.
  1. Algoma Hardwoods, Inc.
  2. Eggers Industries
  3. Marshfield Door Systems, Inc.
  4. Western Oregon Door
  5. Mohawk Doors
  6. Approved Equivalent
- Source quality control
  1. Product support:
     a. Full-time individual or firm based or branched in Colorado
- Standard types and sizes are preferred.
  1. Leaf width:
     a. 36 inches minimum
     b. 42 inches maximum for ADA accessible doors
  2. Height:

a. 7'-0", except for retrofit applications and with approval of District Project Manager.

- Openings in and around doors
  1. Solid flush door without lite is preferred to the greatest extent possible.
  2. Door vision panel maximum dimensions:
     a. Width = 6 inches
     b. Height = 30 inches
  3. Flush door with side-lite is the preferred configuration at classroom doors
  4. Openings in and near high security doors should be narrow (3 inches or less) or security glazing.
- In the absence of other information, standards of the following organizations apply:
  1. Window and Door Manufacturer's Association (WDMA) "Industry Standard for Architectural Wood Flush Doors"
  2. National Fire Protection Association (NFPA) 80, Standard for Fire Doors and Fire Windows, current edition.
  3. IBC
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawing:
     a. Required
  3. Samples:
     a. Face veneer for transparent finish
        (1) Sample shall be large enough to observe grain pattern and finish condition
  4. Other:
     a. Door and Hardware schedule, including label, fire, positive pressure, and 'S' rating, and frame anchorage
  5. Manufacturer's extended warranty for complete replacement of doors that exhibit any of the following defects within the life of the door:
     a. Delamination in any degree
     b. Bow, cup, warp, or twist of 1/4 inch or more
     c. Telegraphing of any part of core through to face in excess of 0.01-inch per 3 s.f.
     d. Deviation from Reference Standards tolerances
     e. Any door condition which impairs performance of the door
  6. Closeout:
     a. Submittals listed above updated to record status
- Restrictions
  1. Wood doors are prohibited for exterior applications.
- Fabrication
  1. Premium or extra heavy duty grade per WDMA
  2. 5 or 7 ply fully bonded construction
  3. Thickness:
     a. 1 ¾ inches
  4. Core:
     a. Structural composite lumber (SCL):
        (1) Preferred

b. Type I –LD-2 density particle board (PB):
(1) Prohibited
c. Stave lumber core (SLC):
(1) Prohibited
d. Gypsum or mineral:
(1) Prohibited.
(2) Use hollow metal door

5. Stile, rail, and cross-band:
   a. Structural composite lumber (SCL) or hardwood
6. Face Veneer:
   a. Grade: A, Premium (WDMA)
   b. Cut: Plain
   c. Grain: Vertical
   d. Pattern: Slip or balance match
   e. Species: White birch or Red oak or Maple
   f. Thickness: 1/50 inches (0.5mm) minimum.
7. Edge Band:
   a. Hardwood laminated to core
8. Finish:
   a. Factory applied UV catalyzed polyurethane (TR/OP6);
      (1) No substitutions.
   b. Include edges, cutouts, mortises
   c. Field finishing and touch up are prohibited.
9. Factory installed blocking and preparation to accommodate scheduled hardware.
   a. Field modification is prohibited
   b. Pre-drill for hinge screws.
10. Manufacturer label identifying all of the above

- Condition wood door to ambient humidity for at least 48 hours before hanging.
- Installed Clearances – Non-Fire-Rated Assemblies:
  1. Head & Jamb: 3/32 inch preferred, 1/8 inch maximum
  2. Meeting stile: 1/8 inch maximum
  3. Bottom at threshold: 1/8 inch preferred, 1/4 inch maximum
  4. Bottom to floor: 1/2 inch maximum (measured from floor finish)
- Field modification or machining of labeled doors is prohibited except as permitted by NFPA 80.

END SECTION 08 14 00

08 31 00 Access Doors and Panels – August 2015

- Work in this section is open to any product or material.
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawing:
     a. Required

3. Closeout:
    a. Submittals listed above
    b. Updated to record status.

- Access doors are mandatory in:
    1. Gridless ceiling systems over 2000 square feet (in order to provide mechanical and electrical system service access).
    2. Utility chases
    3. Sized large enough to allow servicing and removal and replacement of equipment and components.
- Access doors and panels retrofitted into the building egress system require a Building Permit.
- Fabrication
    1. 24 inches minimum net opening dimension, in each direction;
        a. 30 inches preferred
    2. 18 gauge flush steel panel in 16 gauge steel frame
    3. Continuous hinge with stainless steel pin.
    4. U.L. listed for fire rating compatible with wall or ceiling assembly
    5. Lock
        a. Manufacturer's standard key-operated cylinder cam lock in public areas.
        b. 12-gauge stainless steel hasp is permitted for out-of-view non-public locations.
        c. Key all locking specialty doors to one building master key for the type of lock.

END SECTION 08 31 00

08 33 00 Coiling Doors and Grilles – August 2022

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Submittals
    1. Product Data: Required
    2. Shop Drawing: Required
    3. Closeout:
        a. Submittals listed above, updated to record status.
        b. Operation and Maintenance Manual
- Placement of coiling doors and grilles may not jeopardize safe building egress as defined by code.
- Coiling grilles in Corridors and other Areas of Egress, non-motorized:
    1. New Construction: Prohibited
    2. Existing Construction: New installations are prohibited for after-hours corridor security
    3. Prohibited at kitchen serving line.
    4. Overhead type only.
        a. Side coiling not permitted
    5. Open lattice of stainless steel, steel, or aluminum.
- Non-Fire-Rated Coiling Doors and Counter Curtains, motorized
    1. Kitchen serving line, student store, ticket booth, cashier.

2. Motorized operation and pushbutton controls.
   a. Required. Manual awning type crank is permitted for backup operation only.
3. Ratchet device to control descent rate to less than 12 inches per second.
4. Separate timing circuits for alarm condition (10 sec.) and power failure (30 sec).
5. Construction:
   a. Solid, slatted curtain of stainless steel, steel, or aluminum.

- Fire-Rated Coiling Countertop Shutters
  1. Rated Assembly: Electric operated, automatic closing rolling counter fire doors
  2. NFPA 80 and UL listed label for the fire rating classification
  3. Installer approved by Manufacturer
  4. Warranty: Two years manufacturer warranty against defects in material and workmanship
  5. Manufacturer:
     a. Minimum 5 years' experience in producing counter fire doors of the type specified
  6. Curtain:
     a. Solid interlocking flat-faced slats, minimum 22 gauge: powder coated galvanized steel or stainless steel
     b. Bottom bar and vinyl astragal
  7. Endlocks:
     a. Continuous interlocking slat sections with endlocks attached to slats as per UL requirements
  8. Guides:
     a. Minimum 12 gauge formed shapes in same finish as door slats
  9. Counterbalance Shaft Assembly:
     a. Barrel and spring balance designed for the designed span and to minimize deflection. Provide wheel for applying and adjusting spring torque
  10. Brackets:
      a. Reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
  11. Hood and Mechanism Covers (if exposed to view):
      a. Minimum 24 gauge with reinforced top and bottom edges with intermediate support brackets to prevent sag. Same finish as door slats
  12. Smoke Seals and UL Smoke Label (when required):
      a. Bottom Bar: Combination smoke seal/sensing edge
      b. Guides and Head: Replaceable UL listed brush seals
  13. Motor:
      a. UL NEMA 1 enclosure, horsepower as recommended by manufacturer. Voltage base on electrical service. Completely enclosed non-ventilated motor, removable without affecting limit switch settings. Thermal overload protection.
         (1) Failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cable, chains, pulleys, reset handles or mechanisms
         (2) Internal electric failsafe release device that requires no additional wiring, external cables or mounting locations
         (3) Internal solenoid brake mechanism to hold the door at any position during normal door operation

14. Activation and Reset:
    (1) Electrically activate door system automatic closure by notification from local smoke detectors only
    (2) Automatic alarm closure selectable time delay of zero or ten seconds
    (3) Control automatic closure speed with an internal governor
        (a) Maintain automatic closure speed at not more than 9 inches per second
    (4) Electrically reset internal failsafe release device and door operating system upon restoration of electrical power upon clearing of the alarm signal without requiring human supervision or manual reset
    (5) Selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human supervision or manual reset
    (6) Manual control buttons
    (7) Fusible links that require manual resetting after each event are prohibited
15. Testing:
    a. Drop test and reset door system twice by all means of activation as per NFPA 80
    b. District personnel to observe tests

- Exterior, Motorized Overhead Doors
  1. Design wind load:
     a. As per Wind Load Requirements by Authorities Having Jurisdiction
  2. Pass door:
     a. Prohibited as part of the overhead door assemblies
  3. Material:
     a. Aluminum or galvanized steel is preferred
     b. Composite is acceptable
     c. Fiberglass and wood are prohibited.
  4. Drawbar or Jackshaft 110V motor operator
  5. Failsafe electric eye bottom safety protection feature
- Key all locking specialty doors to building master key.

END SECTION 08 33 00

08 41 00 Entrances and Storefronts – August 2022

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawing:
     a. Required
  3. Test Reports:
     a. Air infiltration test.
     b. Water resistance test.
     c. Wind load test.
     d. Thermal performance test.
  4. Closeout:

a. Submittals listed above
(1) Updated to record status.

- In the absence of other information the standards of the American Architectural Manufacturer's Association (AAMA) apply.
- Metal-Framed Storefronts
1. Minimum 3/16 inch (0.188 inch) gauge 6063-T5 or T6 aluminum frame.
2. Full-height internal reinforcement is mandatory at hardware and latch mounting locations
3. Welded hinge pockets
4. 2 inch minimum sightline (stile thickness) x min. 6 inch deep frame profile
   a. Narrow stile design is prohibited
   b. Top rail dimension adequate to mount closer, minimum 10-inches.
      (1) Drop plates to mount door closers are prohibited.
5. Corner construction:
   a. Concealed welded reinforcement bracket.
   b. Thermal break at exterior conditions
6. Finish:
   a. Clear-anodized aluminum only.
   b. Class I anodic coating.
7. Center mullion is mandatory at double doors
   a. Provide keyed removable mullion
8. Doors:
   a. Aluminum doors only in aluminum frames.
   b. Standard 3'-0" x 7'-0" doors. Other sizes must be approved by the District Project Manager.
9. Hardware:
   a. Comply with 08 71 00.
   b. Minimum 3 stainless steel hinges per door leaf (preferred)
   c. Continuous hinges: Min. 600 lb. Rating with approval of District Project Manager.
10. Provide architectural protection for doors to prevent wind damage, especially at north and west exposures.
11. Prohibited:
    a. Compression-fit with cap
    b. Plastic clip
    c. Adhered spandrel panels
    d. Details that permit unauthorized removal of glazing from exterior
    e. Unitized hardware that does not comply with Section 08 71 00
    f. Sloped glazing assemblies

END SECTION 08 41 00

08 44 00 Curtain Wall and Glazed Assemblies – October 2010

- Prohibited
- Refer to Entrances and Storefronts (08 41 00)

END OF SECTION 08 44 00

08 45 00 Translucent Wall and Roof Assemblies – October 2010

- Work in this section is restricted to specific manufacturers that have been previously approved by Jefferson County School District R-1 Facilities Management.
- Submittals
  1. Product Data:
     a. Required
  2. Samples:
     a. Required
  3. Test Reports:
     a. Air infiltration test.
     b. Water resistance test.
     c. Wind load test.
     d. Thermal performance test.
  4. Shop Drawings:
     a. Required
  5. Closeout:
     a. Submittals listed above
        (1) Updated to record status
- Prefabricated flat or curved translucent glass fiber sandwich panel systems for walls or skylights.
  1. Kalwall
  2. District approved equal
- Translucent fiberglass panel faces
  1. Glass fiber reinforced thermoset resin specifically designed for architectural use
     a. Thermoplastic (e.g. polycarbonate, acrylic) is prohibited.
  2. Faces shall not deform, deflect, drip, or detach when subject to heat or flame.
  3. Strength:
     a. Exterior face sheet shall be impenetrable by puncture or blunt force
  4. Faces shall not discolor after extended exposure to sunlight.
  5. Do not install within ten (10) feet of adjacent grade or finish floor.
- Source Quality Control
  1. Ten consecutive year minimum firm history of manufacturing Translucent Wall and Roof Assemblies
  2. Five consecutive year minimum history of completed Translucent Wall and Roof Assembly installations in commercial/institutional buildings in the western USA
  3. Minimum 5,000 square feet installed in Colorado or similar climate
  4. Product Support:
     a. Full time individual or firm based or branched in Colorado

END SECTION 08 45 00

08 50 00 Windows – August 2015

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawings:
     a. Required
  3. Samples:
     a. Preferred
  4. Test Reports:
     a. Air infiltration test.
     b. Water resistance test.
     c. Wind load test.
     d. Thermal performance test.
  5. System Performance/Quality Control:
     a. Comply with IECC for full assembly performance requirements to include glazing.
  6. Certificates:
     a. Submit manufacturer certifications/proofs of compliance with requirements of this section.
  7. Field Sample is required for projects with more than 500 square feet of window
  8. Extended warranty:
     a. Underwritten by window manufacturer.
     b. 5 years minimum term from the date of project acceptance covering defects in materials and workmanship
     c. 5 years minimum term from the date of project acceptance covering specified performance standards.
     d. Monetary limits at any time in the warranty period shall not be restricted to any amount less than the original (sub)contract amount.
  9. Closeout:
     a. Submittals listed above
        (1) Updated to record status.
- In the absence of other information standards of the following organizations apply.
  1. Window and Door Manufacturer's Association (WDMA)
  2. American Architectural Manufacturers Association (AAMA)
- Configuration
  1. Standard window types, sizes, and configurations are preferred over custom.
  2. Operable sash with insect screen is preferred for most exterior applications in assignable spaces.
     a. Minimum opening size of 2 square feet
     b. Provide aluminum screens.
  3. Fixed sash is required in areas where food may be prepared and preferred for public and circulation spaces**.**
  4. Projecting sash may not protrude into pedestrian or occupant traffic patterns.
  5. Steel Windows:
     a. Exterior Hollow Metal sill must be 1 foot minimum above grade.
  6. Operable sash steel windows are prohibited.

7. Glazing stops must be removable.
    a. Screw attachment only
    b. Provide inside set glazing for windows above the first floor and those areas that are difficult to access from the building exterior.

- Aluminum Windows:
    1. Preferred
        a. ANSI/AAMA Heavy Commercial (HC) class
        b. 6063 aluminum alloy tempered to T5 or better.
        c. 0.125 inch minimum extrusion wall thickness
        d. Finish:
            (1) Standard anodized
            (2) Factory baked enamel finish
            (3) Fluoropolymer coating
        e. ANSI/AAMA AW-50 rating, or better
        f. Monumental grade type A3 assembly
        g. Non-magnetic stainless steel fasteners throughout
        h. Deburred cut edges
        i. Thermal-break design
        j. PVC materials in concealed locations only
        k. Fabricated to allow for thermal movement
        l. Corner Joints: Flush, mitered, rigid, weatherproof, hairline joints.
        m. Internal and external drainage to exterior.
        n. Reinforce frame at hardware locations.
- Wood Windows:
    1. Prohibited
- Hardware
    1. Institutional quality, vandal-resistant
        a. Solid white metal with a special coating finish
        b. Solid bronze with plated steel
        c. Brass/bronze operating bars and rods
- Weather-stripping
    1. Non-ferrous spring metal or vinyl gasket compression type.
    2. Woven pile wool, polypropylene, or nylon sliding type.
    3. Completely concealed in closed window.
- Fasteners:
    1. Wood members & units:
        a. Zinc-coated or non-ferrous nails and screws
    2. Hardware & accessories:
        a. Brass screws
    3. To steel frame:
        a. Zinc coated phillips head machine screw.
- Source Quality Control
    1. Ten consecutive year minimum firm history of manufacturing specified window assemblies.
    2. Protruding screws, sharp unfinished edges are prohibited.
- Acceptable Installers

1. In business under the same name in the state of Colorado for no less than 24 consecutive months prior to the bid opening.
2. Certified and approved by the window manufacturer to install and service specified windows.

END SECTION 08 50 00

08 60 00 Roof Windows and Skylights – October 2010

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Submittals
  1. Product Data:
     a. Required
  2. Shop Drawing:
     a. Required
  3. Closeout:
     a. Submittals listed above
        (1) Updated to record status.
- The use of skylights is generally not recommended, for reasons of acoustics, safety, security, glare, blackout, energy efficiency, occupant comfort, weathertightness, hail, and maintenance,.
- Daylighting by means of vertical glazing in the form of clerestories, monitors, or borrowed lights is preferred, to the greatest extent possible.
- When provided, limit skylights to non-assignable, public, and circulation areas equipped with security detection system
- Skylights over 20 square feet are prohibited.
- Light tubes are permitted with District approval.
- Skylight design and construction
  1. Configure skylight to roof structure, sheathing, and insulation so as to permit future retrofit roofing without removal or modification of skylight curb.
  2. Frame: Pre-manufactured aluminum or galvanized steel unit configured to permit removal for maintenance. Site fabricated and wood frames are prohibited.
  3. Curb: Double wall insulated with vertical dimension sufficient to permit 8 inch minimum base flashing
  4. Counterflashing: Pre-manufactured metal profile to fit frame and dimensioned to overlap base flashing a minimum of 3 inches.
  5. Glazing
     a. Preferred: 0.6 inch cellular polycarbonate structured sheet (PCSS) with UV-resistant coating
     b. Alternate: 3/16 inch minimum thickness double wall clear or translucent acrylic
     c. Glass glazing is prohibited.
  6. Profile:
     a. Pyramid
     b. Dome.

END SECTION 08 60 00

08 62 00 Tubular Skylights – August 2018

- Acceptable Manufacturers:
  - Products of the following approved manufacturers meeting requirements:
    - Solatube International, Inc.
    - Velux America, Inc.
    - Acceptable Manufacturer meeting requirements
- The use of tubular skylights is generally not recommended without justification for specific needs. Use with approval of District Project Manager only. District roofing staff to approve specific technologies for each roof surface.
- Submittals
  - Product Data:
    - Required
    - Include impact resistant data and options
  - Shop Drawing:
    - Required
    - Wiring diagram if dimmers are used
    - Photometric data
    - Independent test data
  - Warranties
    - Tubular Unit Skylight Assembly: 10 years
    - Tunnel Reflective Coating: 20 years
  - Closeout:
    - Operation and Maintenance Data
    - Submittals listed above
      - Updated to record status.
- Manufacturer Qualifications: Minimum 5 years' experience in the U.S. manufacturing units.
- Tubular unit skylight daylighting system: Tubular unit skylight daylighting devices with exterior glazed dome, glazing retainers and gaskets, exterior curb counterflashing assembly with integral adjustable pivot device, reflective tunnel, interior diffuser assembly.
  - Maximum diameter: 24-inches. Larger diameters require approval of District Project Manager.
  - All exposed metal surfaces: Powder coated or baked enamel meeting AAMA 2602 except with a min. dry film thickness of 1.5 mils.
  - Formed curb counterflashing for mounting on prefabricated roof curbs
  - For flat and low slope roofing applications only
  - Standards: AAMA/WDMA/CSA 101/I.S.2/A440
  - Min. Performance Grade: TDDCC/TDDOC-PG130
  - Min. Design Pressure: +300/-130 psf
  - Water Test Pressure: 15 psf with no leakage as per ASTM E331
  - Air Leakage Rate: Max. 0.30 cfm/sf as per ASTM E283

  - Surface-Burning Characteristics of Plastic Glazing: 650 deg F or more as per ASTM D1929
  - Smoke Index: >450 as per ASTM E 84
  - Smoke Density: >75 as per ASTM D 2843
  - Burning Characteristics: ASTM D 635 for Polycarbonate Class CC1
  - Energy Performance:
    - Thermal Transmittance: NFRC 100 Max. U-Factor of 0.50 Btu/hr/sf/degF or better performance.
    - Solar Heat Gain Coefficient: NFRC 200 Max. of 0.40 SHGC
  - Electrical Components: NFPA 72
  - Fall Protection Standard Compliance: 29 CFR 1910.23: Passed
- Dome Glazing: 0.125 inch minimum thickness injection molded transparent polycarbonate with UV-absorbing additive.
- Impact resistant to hail. Include impact strength.
- Reflective Tunnel: Class II anodized aluminum sheet, min 26-gauge, with specular surface coating.
- Diffuser and Controller: Frosted Lens
  - Injection-molded copolymer
    - Daylight dimmer: 24 VDC input voltage adjustable daylight output Daylight controller: Combination power supply and DP/ST switch, 110-227VAC input and 24 VDC output, capable of operating up to ten daylight dimmer units to operate reflective paddle to stop at all positions between fully open and fully closed.

END SECTION 08 62 00

08 71 00 Door Hardware – August 2022

- Work in this section is restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District, R-1.
- Consultant shall meet with the Zone Locksmith to review project scope and details specific to the location.
- Substitutions are prohibited
- New Construction
  1. Lock/Latch:
     a. Exterior Doors and Doors with Access Control: Schlage Everest T125
     b. Exterior Doors and Interior Doors without Access Control: Schlage Classic. Verify keyway with Zone Locksmith.
     c. Classroom Doors: ANSI F109 thumb punch/turn functions
     d. Administration Suite: From Secured Vestibule into Administration Suite: ND80; from School into Administration Suite: ND80. Reference Technical Details Drawings, Volume II.
  2. Keyway
     a. Everest for new construction T125
        (1) Schlage Classic

   b. Continue use of existing keying systems at renovations and additions with approval of District Project Manager only.
3. Finish:
   a. US26D or BHMA #626 – Satin Chromium.

- Building Addition
  1. Lock/Latch:
     a. Any product manufactured by the designated "Predominant Manufacturer" for the facility. Verify manufacturer with Zone Locksmith.
     b. Classroom Doors: ANSI F109 thumb punch/turn functions
  2. Keyway:
     a. Match "Predominant Manufacturer" if listed in this Section.
     b. Jefferson County School District, R-1 Project Manager will establish "Predominant Manufacturer" if not listed.
  3. Exterior Doors and Doors with Access Control: Schlage Everest T125 Finish:
     a. Match existing building hardware finish if consistent with finishes permitted by this section of the Technical Guidelines.
     b. Jefferson County School District, R-1 will establish finish, if existing finish is mixed or not listed in this section of the Technical Guidelines. Verify with the District Project Manager. US26D or BHMA #626 – Satin Chromium preferred.
  4. Food Service access to Kitchen if access is not directly from building exterior: MARIQ1LITE 160 user cylindrical keypad.
- Building Renovation
  1. Same as Building Addition, except that Jefferson County School District, R-1 Project Manager will establish the "Predominant Manufacturer" for the facility based upon the lock/latch and/or the keyway.
  2. Food Service access to Kitchen if access is not directly from building exterior: MARIQ1LITE 160 user cylindrical keypad.
- Coordination
  1. Solid blocking between studs of frame construction to support wall mounted items such as stops.
  2. Keying with Jefferson County School District.
     a. Contractor supplies Construction Cores and provides the District Project Manager with final number of Everest T125 cylinder cores required.
     b. The District Project Manager will coordinate with the District's zone locksmith to remove construction cores and install T125 cores at project acceptance
  3. Template with door/frame manufacturer & installer.
  4. With Access Control Hardware (08 74 00)
  5. Electro-Mechanical Hardware requires coordination among:
     a. Architect
     b. Electrical engineer
     c. Hardware supplier/contractor
     d. Electro-mechanical hardware supplier/contractor
     e. Frame supplier/contractor
     f. Electrical Contractor
     g. Security systems Contractor
  6. A hardware and keying conference is mandatory within 30 days of contract award.
  7. Key stamping and distribution

- In the absence of other information, standards of the following organizations apply:
  1. Builders Hardware Manufacturers Association (BHMA)
  2. American National Standards Institute (ANSI)
  3. National Fire Protection Association (NFPA)
- Submittals
  1. Product Data:
     a. Required
        (1) Catalog cuts to include:
            (a) Item
            (b) Manufacturer
            (c) Type
            (d) Reference number
            (e) Finish
        (2) Manufacturer's installation instructions
  2. Hardware Schedule:
     a. Required
     b. Per DHI document, "Sequence and Format for the Hardware Schedule"
     c. Clearly indicate the manufacturer of each item proposed. Reference template(s).
  3. Keying Schedule: Per DHI manual "Keying Procedures, Systems, and Nomenclature".
  4. Closeout:
     a. Submittals listed above updated to record status.
     b. O&M Data
        (1) Required for all specified hardware items.
     c. Bitting List (Electronic Spreadsheet):
        (1) Closeout submittal to be forwarded directly and securely to the District Project Manager.
  5. To the greatest extent possible a single manufacturer is required for each hardware category throughout a facility.
  6. Unless otherwise noted, products in this section are expected to be Grade 1, heavy duty.
        (1) Approved hardware finishes - New Construction:US26D, BHMA #626 - Satin Chromium
        (2) US32D, Dull Stainless steel: Permitted only when above finishes are unavailable for specified hardware item.
  7. Closer
     a. Factory applied sprayed aluminum paint
  8. Threshold, weather-stripping
     a. Mill finish aluminum
- Keying
  1. Key bitting:
     a. Prior to developing bitting meet with Zone Locksmith to discuss keying program
     b. Conform to Jefferson County Public Schools master key program
     c. Provide bitting list in electronic format to the District Project Manager in a confidential and secure manner
  2. Grand Master Keys:
     a. For Facilities Services only

3. Master Keys:
   a. Exclude utility areas, boiler rooms, telecom, etc
   b. Elementary school:
      (1) Provide 10 each per set
   c. Middle and High school:
      (1) Provide 20 each per set
   d. Other facilities:
      (1) Provide 5 each per set
4. Main Entrance Key:
   a. Separate key and master key
   b. Provide 1 key for each 6 classrooms
5. Area master keying:
   a. Kitchen/Cafeteria/LMC/LIC
      (1) Provide 5 keys each
   b. Office/Administration complex
      (1) Provide 1 key for each room or office
   c. Gymnasium/Athletic complex
      (1) High School
         (a) Provide 30 keys
      (2) All other schools
         (a) Provide 8 keys
6. Classroom keying options (by Shop Locksmith in coordination with the District Project Manager)
   a. Keying by room:
      (1) Provide 4 keys per classroom
   b. Keying by pod, wing, or department
      (1) Provide 2 keys per classroom
7. Computer room keying options by Shop Locksmith in coordination with the District Project Manager)
   a. Key as a classroom
   b. Key with LMC/LIC
8. Custodial and Utility (closets, storage, mechanical, electrical, etc.)
   a. Key mechanical room door(s) to Jefferson County School District R-1 grand master
   b. Common key to all service areas in a facility and building master
9. The following locks should be operable by all facility keys
   a. Faculty lounge
   b. Workrooms
   c. Toilet rooms
10. Key all miscellaneous and specialty door locks to building master
11. Construction Master Keys
    a. Provide 10 each
12. Key blanks
    a. No requirements
13. Key control
    a. Stamp "DO NOT DUPLICATE" on each key

   b. Facilities Maintenance Locksmith will provide written instructions for serial number, stamping and distribution
   c. Provide a key control system including envelopes, labels, tags, recap and firms
   d. Convey all keys to the District Project Manager including building keys, casework & equipment keys, fire box, pull stations, equipment, electric panel keys and any other system within a locking cabinet. Zone Locksmith will be responsible for reviewing and setting up the key cabinet

- Key Cabinet
  1. Card index in a standard wall type metal key cabinet
  2. Capacity
     a. 150 percent of the number of locks for 300 for Middle and High school or 150 for other facilities, whichever is greater
- Lock/Latch
  1. Sole source specifications are required for lock/latchset and keyway according to the "Predominant Manufacturer" established for each Jefferson County School District, R-1 facility.
     a. Schlage ND Series – Rhodes Trim
  2. ANSI A156.2, Series 4000, heavy duty, Grade 1, through bolted, cylindrical or bored type with 1/2-inch throw latchbolt and lever trim
  3. Able to be installed in standard 161 type cut out
  4. Backset
     a. 2 ¾ inches uniform throughout facility
     b. 3 ¾ inches is permitted in retrofit applications to match existing
  5. Function:
     a. Classroom security function is preferred for most applications
     b. Passage function is preferred for elementary school classroom closets
     c. Storeroom (locked at all times) lock function at janitor closets, electric and mechanical equipment rooms
     d. Faculty toilet rooms should have an "Occupied" indicator mode
  6. Classroom Door Locksets:
     a. Locksets accessing teaching areas should be lockable from the interior of the room without the use of a key or having to reach outside the room to lock the door.
  7. Construction Cylinders:
     a. No special requirements
  8. Mortise-type locksets:
     a. Prohibited
     b. When used, limit to HM and reinforced wood doors in secondary schools
  9. 'Silent' mechanisms are preferred for auditorium doors
  10. Non-operable fixed lever
- Panic Exit Devices
  1. Restricted to specific manufacturers that have been previously approved by Jefferson County School District R-1 Facilities Management
     a. Von Duprin 98 Series
     b. Sargent 80 Series Note: with 19 & 43 prefix. Flush end cap and no plastic insert on push bar
     c. LCN: Use is discouraged. With approval of District Project Manager only.

2. Where panic exit devices are required for exiting from classrooms, include manual locking thumbturn and a visual Locked/Unlocked indicator.
3. For all non-FOB access-controlled exits that exit directly to the building exterior at High Schools, provide:
   a. Von Durpin GUARD-X Exit Alarm Lock device
   b. Retrofit kits design for use in Von Duprin panic exit devices may be used with approval of District Project Manager.
4. UL Listed
5. Rim type device is mandatory at aluminum frames and at pairs of doors with removable center mullion
6. Vertical rod panic devices
   a. Prohibited.
7. Flat push or touch bar
   a. Drop bar design is prohibited
8. Tamper resistant dogging feature is required for non-rated exit devices.
   a. Allen wrench activation is preferred
   b. Key cylinder activation is prohibited
9. Night latch (NL) function
   a. Thumb piece is prohibited
10. No exterior trim on LHR side or non-operable side unless approved by the District Project Manager.
11. Glass lites in doors are not permitted within 6 inches of panic exit device
12. Install panic exit devices with through bolts at wood interior doors
13. All locations required by code

- Removable Center Mullion
  1. Steel removable center mullion, equipped with cylinder lock
  2. Provide UL rated mullion at rated door assemblies
  3. Von Duprin KR4954/9954 key removable steel; KR4854 where electric strike occurs. Include stabilizers and mullion storage device.
- Flushbolt
  1. Per applicable codes
  2. Automatic flush bolts prohibited
- Deadbolt
  1. Not recommended
  2. Limit use to non-occupied high-security areas
- Keyway
  1. Sole source specification according to facility “Predominant Manufacturer”
  2. 6 pin standard core
  3. Interchangeable core cylinder is prohibited.
  4. Except for emergency access and access control doors, exterior keyways are prohibited or plugged
- Push/Pull
  1. Metal only, unless otherwise required to match existing
  2. Thickness: 0.050-inch minimum
  3. Hardboard is prohibited
- Hinge

1. Doors with exit devices
   a. 1-3/4 thick up to 3 feet 4 inches wide: FBB 168 4-1/2 x4-1/2
   b. 1-3/4 thick over 3 feet 4 inches wide: FBB 168 5 x 4-1/2
2. Interior doors
   a. 1-3/4 thick up to 3 feet 2 inches wide: FBB 179 4-1/2 x 4-1/2
   b. 1-3/4 thick over 3 feet 2 inches wide: FBB 168 5 x 4-1/2
   c. 0.180 gauge
3. Ball bearing; 5 knuckle
4. Non-removable pin (NRP) is mandatory at out-swinging exterior doors
5. Butt leaf width sufficient to clear all trim
6. Center hung doors, balanced hinges, and Pivot hinges are prohibited
7. Full height continuous ("piano") type hinges are preferred for doors in high abuse areas.
   a. R2 Hinges
   b. Select Hinges

- Kickplate
  1. Kickplate is required at the push side of wood doors opening to corridors and serving an occupancy load over 20
  2. 18 gauge stainless steel, brass, or bronze
  3. Clear acrylic
     a. Prohibited
  4. Hardboard
     a. Prohibited
  5. 30 inch high kickplate is required at push side of high traffic wood doors at kitchen
  6. 12 inch high kickplate elsewhere
  7. Width
     a. 2 inches less than door width on single doors
     b. 1inch less than door width on pairs
- Door Closer
  1. Sole source specifications
     a. LCN 4041 interchangeable. Provide screw anchored cover ST-3596
     b. LCN 4012 or 4013 is permitted where a handed closer is required
  2. Grade 1 heavy-duty cam action type is recommended for most applications
  3. 60% minimum efficiency
  4. Class 30 cast iron body with full cover
  5. Piston
     a. Heat treated
  6. Pinion
     a. Double heat treated
  7. Adjustable spring sizes 1 through 6
  8. Arm
     a. Forged steel, heavy duty
  9. Parallel arm (push side) installation.
  10. Integral stop arm is permitted only when separate doorstop is not feasible
  11. Maximum operating force, measured at lockset
      a. Per applicable current codes and ADA
  12. Drop-down plates are required on doors where glass obstructs the closer bracket

13. Use through bolts at wood doors to install closers. Use of "SRT" (self-reaming and tapping) anchors is prohibited
14. Do not provide closers on non-fire-rated doors unless noted elsewhere and approved by the District Project Manager.

- Floor mounted closures/pivots
  1. Prohibited
- Hold-Open devices
  1. Not recommended for interior doors unless electro-mechanical type
  2. Required for exterior doors in loading areas
  3. "Smoke Check" electronic type automatic closers are prohibited
- Astragal
  1. Astragals are recommended at 2 leaf service and utility doors
  2. Except as required by code, astragals on fire doors are prohibited without the approval of Jefferson County School District, R-1.
- Coordinators
  1. Not recommended
  2. Non-hanging type only
- Stop
  1. Wall type stops are preferred
  2. Floor mounted stops are acceptable only when wall stop is infeasible
  3. Arm type overhead stop is prohibited unless integral with closer
- Threshold
  1. Maximum height permitted by ADA
  2. Dead-level thresholds are prohibited at exterior doors
  3. Thermal barrier design is required at exterior doors
  4. Vinyl-top designs are prohibited
  5. Seal to exterior concrete slab
- Weather-stripping
  1. Smoke gaskets per code; acoustical gaskets elsewhere at doors to assignable interior spaces
  2. Automatic Door Bottoms
     a. Prohibited without the approval of Jefferson County School District, R-1.
  3. Sweep type weather-stripping is not recommended at jambs or meeting stiles
  4. Exposed surface-mounted weather-stripping is prohibited except at door bottom
  5. Adjustable door bottom sweeps may be considered at exterior door locations where exterior concrete slab movement is anticipated or probable.
- Electro-Mechanical Hardware
  1. Not recommended except for
     a. Magnetic hold-open devices required by code in corridors
     b. Card access control at designated openings
  2. See 08 74 00
  3. See 08 71 13
  4. Automatic door operator
     a. Permitted for ADA accessibility with approval of District Project Manager only.
     b. Not required
  5. Delayed Egress Hardware

    a. Not permitted
- Accessories
  1. Strike plate
     a. Manufacturer's standard with sufficient lip to protect trim
  2. Silencers
     a. Minimum 3 per Hollow Metal frame
     b. Latch side of stop
  3. Security cover (guard) plate is required over latch bolt in exterior doors
     a. Not permitted at doors with panic hardware or in-swinging doors
- Screws & Fasteners
  1. Sex nuts and bolts are required throughout
  2. Exposed-to-view screws
     a. Match the hardware finish as closely as possible
  3. Door closers and exit devices on wood doors
     a. Closed-head sex bolts
     b. Use of "SRT" (self-reaming and tapping) anchors is prohibited
- Source Quality Control
  1. Substitutions are prohibited
  2. Fire Rated Openings
     a. UL labeled
     b. Hardware for fire rated openings shall comply with NFPA Standard 80
     c. Provide only hardware which has been tested and listed by UL for the types and sizes of doors required and complies with the requirements of the door and frame labels
  3. Tag each item or hardware package separately with identification related to the final hardware schedule
     a. Include installation instructions in the package
- Acceptable Installers
  1. Experienced in furnishing and servicing hardware in the state of Colorado for not less than five consecutive years
  2. The supplier shall have in his/her employ an Architectural Hardware Consultant certified by the American Society of Architectural Hardware Consultants (AHC), who is available for assistance during the course of the work and throughout the warranty period regarding work in this section and the following:
     a. Installation & repair training
     b. Service equipment
     c. Master Keying
     d. Key Control
     e. Replacement/repair parts
- Installation
  1. Do not install surface mounted items until finishes have been completed
  2. Panic Hardware
     a. Through-bolt attachment is required
  3. Closer
     a. Through-bolt attachment is required
     b. Parallel (push side) mounted

4. Panic exit device
    a. Screw attachment is prohibited
    b. Notching of frame is prohibited
5. Weather-stripping and seals
    a. Continuity of installed weather-stripping should not be interrupted

- Pre-installation conference is mandatory
    1. Include:
        a. Jefferson County School District, R-1 Project Manager
        b. Architect
        c. General Contractor
        d. Door and Frame Contractor
        e. Hardware Supplier (and Installer if separate)
        f. Facilities Maintenance Locksmith
- Adjust and check each operating item of hardware and each door to insure proper operation or function of every unit
    1. Replace units, which cannot be adjusted to operate freely and smoothly as intended for application
    2. Clean and re-lubricate hardware items as necessary to provide smooth operation

END SECTION 08 71 00

08 71 13 Automatic Door Operators – August 2022

- Work in this section is restricted to specific products of specific manufacturers that have been previously approved by Jeffco Public Schools Facilities Management.
- Included only with approval of the District Project Manager.
- LCN 4600 Series. 689 Finish
    1. If wall stop is not feasible, provide with flush ceiling mount and Glynn Johnson 90S.
    2. Provide hardware actuators to the greatest extent possible.
- Submittals
    3. Product data:
        a. Required
    4. Shop drawing:
        a. Required
            (1) Include
                (a) Riser diagram
                (b) Portal control wiring interface
                (c) Door elevation diagrams.
    5. Closeout:
        a. Submittals listed above
            (1) Updated to as-constructed status
            (2) Operation and Maintenance manual including thorough system test procedures.
- Coordination
    1. See Section 08 71 00 Door Hardware
    2. See Section 08 74 00 Access Control Hardware

END SECTION 08 71 13

08 74 00 Access Control Hardware – October 2010

- Work in this section is restricted to specific products of specific manufacturers that have been previously approved by Jeffco Public Schools Facilities Management.
- Reference Division 28 of these Guidelines.

END SECTION 08 74 00

08 79 00 Hardware Accessories – October 2021

- Work in this section is restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District, R-1 Facilities Management.
  1. Knox-Box as manufactured by the Knox Company, Phoenix, AZ
- Key Storage Equipment
  1. Mandatory for buildings over 5,000 gross square feet and as required by Authorities Having Jursidiction.
  2. Knox-Box model 4400 series
     a. Recess mounted
     b. Dual lock
     c. Black
     d. Without tamper switch (Knox part #4432)
  3. Dual cylinder:
     a. Top cylinder keyed to local fire department
     b. Bottom cylinder keyed to Jefferson County Public Schools, R-1 cylinder (Knox System Code ss-07-201-03-05)
  4. Install near main building entrance, minimum 6 feet 6 inches above adjacent grade or as mutually agreed upon by the local fire department and Jefferson County Public Schools.
     a. Coordinate location(s) of Knox-Box with Local Fire Department and District Project Manager
  5. The School District will order Knox-Boxes and Contractor will install. Contractor shall provide to District Project Manager the schedule for installing Knox-Box and confirm rough-opening dimensions for recessed mounting.
     a. Provide installation schedule ensuring School District can order Knox-Box in a timely manner and Knox-Box can be installed prior to final inspections.
        (1) Contractor shall notify the District Project Manager a minimum of 4 months prior to requiring receipt of Knox Box.
     b. School District will deliver Knox-Box to Contractor for Contractor to install.

END SECTION 08 79 00

08 80 00 Glazing – August 2021

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- In the absence of other information, standards of the following organizations apply:
  1. Flat Glass Marketing Association (FGMA) Glazing Manual
  2. American Architectural Manufacturers Association (AAMA)
  3. National Fenestration Rating Council (NFRC)
  4. Windows and Daylighting (http://windows.LBL.gov)
- Submittals
  1. Product Data:
     a. Required for Processed glass
  2. Samples:
     a. Required for Processed glass
  3. Closeout:
     a. Submittals listed above
        (1) Updated to record status.
- Warranty
  1. Insulating glass:
     a. Ten-year manufacturer's material and labor warranty for replacement of units with defective seals exhibited by any of the following and not due to breakage:
        (1) Internal moisture or condensation
        (2) Internal dust or dirt
        (3) Deterioration of internal coatings
- Maintenance
  1. Coordinate the design and location of glazing to provide method(s) for cleaning and replacement.
  2. Assure availability of replacement units within the Denver Metro Area.
  3. Issues for glazing over 10 feet above first floor elevation:
     a. Inside set glazing is preferred
        (1) Especially above first floor level
     b. Unit size limit:
        (1) 12 square feet
  4. Minimize types of glazing in a single building.
  5. Insulating Glass is mandatory for exterior applications.
  6. Plastic glazing is mandatory for non-vertical installations.
  7. Glazing within 12 inches of floor or grade is prohibited.
  8. Glazing within 36 inches of floor or grade is prohibited unless it is
     a. Heat-treated or
     b. Laminated
  9. Tinted glass is preferred over reflective glass.
- Monolithic glass:
  1. Clear Float Glass:
     a. 1/4 inch thick
     b. Glazing quality
- Insulating glass
  1. Double pane factory-sealed 1 inch units.
  2. Organic double sealed edge; triple seal is preferred. Silicone single seal is prohibited

3. Breather tubes as required for altitude.
4. Coated or uncoated,
5. Color: Gray/bronze preferred
6. Each unit must bear Insulating Glass Certification Council (IGCC) certification numbers.

- Insulating Low-Emissivity glass:
  1. No requirements
- Laminated Architectural Glass:
  1. No requirements
- Wired Glass:
  1. Prohibited unless fire-rated and ICC approved for educational occupancies.
- Wireless fire-rated ceramic glazing:
  1. As per Requirements for 20, 45, and 90 minute fire-rating requirements
- Tempered glass:
  1. Horizontal-tempering process is preferred.
  2. Heat-strengthened (treated) flat glass. ASTM C1048.
- Laminated glass:
  1. Approved UV-resistant interlayer laminated between an interior and exterior layer of glass. Min. .030-inch (.76 mm) PVB interlayer. ASTM C1172
- Security Safety Glazing:
  1. Use at exterior doors, exterior sidelites, and exterior glazing adjacent to exterior doors and at other locations as directed by the District Project Manager.
  2. Single glazed, uninsulated glass: Min. .030-inch (.76 mm) PVB interlayer sandwiched between 1/8-inch glass panels.
  3. Double glazed, insulated glass:
     a. Exterior glass layer (Outboard Lite): as specified under Exterior Glazing Schedule.
     b. Interior glass layer (Inboard Lite): as specified under Exterior Glazing Schedule with min. .030-inch (.76 mm) PVB interlayer sandwiched between 1/8-inch glass panels.
- Impact Safety Rated Glazing:
  1. Mandatory in high activity areas such as Gymnasium, Aerobics, Performance, Commons, and corridors.
- Annealed Glass:
  1. Not recommended
- Patterned Glass:
  1. Not recommended
- Optical glass:
  1. Required at projection windows
- Mirrors:
  1. Frame type for future replacement
  2. At Weight Rooms, Dance and Aerobics Areas, and other areas of potential impact, provide Mirror Backing Safety Film/Tape applied for full coverage to backside of mirror.
     a. Copolymer film laminated to a bi-directional woven polymer with high-performance adhesive: ANSI Z97.1

b. Designed to pass Category II mirror shatter-proofing on both vision and tape sides.

- Plastic Glazing:
  1. See 08 45 00
  2. Acrylic glazing ("Plexiglas") is prohibited.
  3. Polycarbonate ("Lexan"") glazing including multi-wall cellular polycarbonate structured sheet:
     a. Restrict to special applications over 8' - 0" above finished floor.
     b. Glass coated type
     c. Abrasion resistant
     d. 1/4 inch minimum thickness
     e. Maximum pane dimension: 24 inches
     f. L/100 maximum deflection
  4. Fiber Reinforced Plastic (FRP):
     a. Not Recommended
- Glazing Installation
  1. Dry glaze method is preferred
     a. Applied stop:
        (1) Recommended
     b. Tape and wedge gasket:
        (1) Permitted
     c. Pressure Bar:
        (1) Permitted
  2. Wet glaze method:
     a. Not recommended
  3. Wet / Dry glaze method:
     a. Permitted
  4. Marine glazing method:
     a. Not recommended

- Exterior Glazing Schedule: Comply with IECC requirements.
  1. Vertical Fenestration:

U-Factor (Assembly)	
Fixed Fenestration	0.36
Operable Fenestration	0.45
Entrance Doors	0.63

SHGC – Solar Heat Gain Coefficient		
Orientation	N (within 45° of North)	SEW
PF < 0.2	0.53	0.40
0.2 ≤ PF < 0.5	0.58	0.48
PF ≥ 0.5	0.64	0.64

PF = Projection Factor

VT – Visible Transmittance	
N (within 45° of North)	SEW
Min. 0.60	Min. 0.50

2. Skylights:

U-Factor	0.50
SHGC	0.40

3. Visual Transmittance:
   a. Consider the visible light to solar heat gain ratio (LSG)
   b. Recommended LSG of 1.25 or greater
   c. Comply with *ANSI/NFRC 200 – Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Light Transmittance at Normal Incidents*
4. Provide NFRC Certification for window assemblies
   a. Label must be applied to window unit to confirm U-Factors, SHGC, and VT
5. Schedule assumes non-solar building design.
6. Shading coefficient recommendation assumes no shading by other means.
7. Consider the entire building envelope when selecting the glazing assembly; U-Factor may be able to be reduced pending other envelope U-values.
   a. Reference IECC

- Interior Glazing Assemblies
  1. Transaction Window/Counter at Secured Vestibules
     a. Install at secured vestibules at all levels of school programs.
     b. Single pane laminated glazing unit meeting requirements of Security Safety Glazing listed within this Section 08 80 00.
        (1) Fixed within frame (no sliding units)
        (2) Min. .030-inch (.76 mm) PVB interlayer sandwiched between min. 1/8-inch glass panels - ASTM C1172. Maximum total glazing assembly thickness allowed: 1/2-inches.
            (a) Design thickness of glazing to avoid cracking or breakage from edge impacts and based on size of opening and full glazed panel.
        (3) Set into standard frame with glazing stops to match adjacent interior vision panels
        (4) Set bottom edge of glazing panel into countertop or provide continuous stainless steel bottom trim edge on glazing
        (5) Cut glazing panel at drop-in tray to run along the top edge of tray if setting glazing edge into countertop.
     c. Speak-through opening without the use of a grille insert or electronic microphone
        (1) Opening in glazing unit with off-setting glass baffle allowing for speech transfer between the two glass panels without compromising the security of the employee. Set baffle apart with secured spacers. Minimum 1-inch offset for sound transfer.
     d. Brushed stainless steel open transaction drop-in tray set into countertop

(1) Min. 16”l x 10”w x 1.5”d
(2) Transaction drawers or tray enclosures are prohibited.

e. Pre-assembled transaction windows with frames allowed only with approval of District Project Manager
f. Ballistic-rated glazing units prohibited.
g. At Fire-Rated Partitions, the preferred solution is to incorporate a non-fusible link overhead coiling fire-rated counter shutter to maintain the integrity of the fire-rated partition.

END SECTION 08 80 00

08 90 00 Louvers and Vents – August 2015

- Work in this section is open to any product or material
- Operable louvers and vents should be tool-adjustable only.
  - Manually adjustable units are not recommended.
- Pre-finished Metallic construction. Wood is prohibited.

END SECTION 08 90 00