DIVISION 08 – OPENINGS

General: All exterior door and window frames shall be classic, neutral colors to avoid these becoming outdated.

For new construction and major renovations, all public and primary staff use exterior entry doors will have card key access. For retrofits, all primary and secondary entry doors will have card key access – see 28-13-00, Access Control.

Accessibility: Meet OSSC, ANSI 117.1, ADA-AG and Universal Design Standards. For new construction and major renovations, provide power assisted doors at all primary entrances in addition to provide required clearances when possible. Add to existing schools when possible.

Historic: Windows that contribute to the historic qualities of the school are to be rehabilitated rather than be replaced if possible. Windows with single pane glazing may be refitted to accommodate insulated glazing or operable storm window systems.

Replacement windows are to replicate original windows in style and operation.

Review the Programmatic Agreement for Energy Efficiency, Weatherization, Rehabilitation and Interior Retrofit Projects, February 2012, Stipulation II H – Windows and Doors.

Follow the Secretary of the Interior's Guidelines for Rehabilitation of Historic Buildings for Windows, Doors and Storefronts.

Sustainability: Windows should be designed to contribute to daylighting without introducing unnecessary glare and minimizing heat gain.

Selection of materials that promote a healthy environment on a holistic level are preferred. Use of materials and systems that directly affect the health of building occupants are required to meet applicable sustainability standards.

Meet the VOC and other requirements for LEED for Schools Low-Emitting Materials.

Consider the life-cycle impacts of material choices.

Material sourcing and ingredient transparency should be considered in material selection and submission of Health Product Declarations, Environmental Product Declarations and ILFI Declare Label should be included whenever possible.
Use of healthy materials that meet the requirements of established standards such as Living Building Challenge Red List Free, Cradle to Cradle, Green Guard, CHIPs or Building Green Approved is encouraged.

Doors: Doors are to be selected to withstand impact and abrasion
See Door Hardware for kick plate and armor plate requirements.

Windows: Windows are to be selected to maximize longevity of operation

08-01-52 Wood Window Repairs

A. Wood Patching Compound: 2-part epoxy-resin wood compound with a 10-15 minute cure at 70 degree F, in knife grade formulation and recommended by manufacturer for type of wood repair indicated. Compound shall be designed for filling damaged wood materials that have deteriorated due to weathering and exposure. Compound shall be capable of filling deep holes and capable of spreading to a feather edge.
B. Meet the Department of Interior standards referenced above.
C. Example Product: Liquidwood with WoodEpox by Abatron, Inc. or Primatrate with Flex-Tec HV by Advanced Repair Technology.

08-10-00 Doors and Frames, General

A. This section shall be followed for new construction and to the extent possible in major renovations. For existing schools, meet these requirements to the extent possible when replace/renovating doors.

B. Note: Consideration should be given to the movement of equipment within the building. Examples: scrubbers, man lifts, etc.

C. Provide protective cover over exterior doors for water intrusion protection. 1:4 ratio minimum width to height for protection (2' overhang min. at 8' high door).

D. Extra heavy duty WDMAI.S.1-A

E. Exterior Doors and Entrances
   1. 36" – 38" width minimum, 42" preferred for ease of maneuvering equipment and for universal design.
   2. 84" height, minimum.
   3. 1-3/4" thick, typical.
   4. Pairs of doors to provide a 6'-0" clear opening at mechanical rooms, gyms and cafeterias on grade or at landings with minimum 6' wide ramp, when possible, for loading purposes.
   5. Provide removable mullions between multiple doors for ease of moving equipment and durability of closure. (I / C Cores)
      a. All mullions to be keyedto interior keys.
   6. Doors swing is to be limited by a bollard or wall mounted stop.

F. Interior Doors and Entrances
   1. Provide Hollow Metal Frames: 16 ga. minimum or wood frames of no less than 1" actual thickness.
   2. 14 gauge required for doors 42 inches or wider.

G. Fire Doors
   1. Cross-Corridor Doors are preferred to overhead coiling doors because these maintain exiting from either direction.
   2. Doors to be recessed in a 'pocket' whenever possible. Must meet fire code and existing requirements.
   3. Provide all required hardware including magnetic hold-open connected to fire alarm panel.

08-12-13 Hollow Metal Frames

A. General:
   1. Continuous welded corners.
   2. Provide mineral fiber inside door frames for improved acoustical and thermal performance.
   3. Provide standard reinforcement at locks, hinges and closers per ANSI/SDI 250.6 as modified by District Details S-199 and S-200.
   4. 5" butts at exterior locations, 3 butts per door minimum.
   5. See PPS District Standard Drawing No.S-199 - Hollow Metal Frame Reinforcing. Comply with ANSI/SDI 250.6 as modified by this detail.

B. Exterior:
   1. 14 gauge minimum.
   2. Prepped for access control.

C. Interior:

D. 16 gauge minimum for typical doors.

E. 14 gauge minimum for extra heavy-duty interior openings, and openings over 42 “in width and/or 7’-0” in height.

08-13-00 Hollow Metal Doors

A. Fully welded seamless construction (no visible seams and/or joints).

B. Prime welds with zinc rich coating.

C. Provide standard reinforcement at locks, hinges and closers per ANSI/SDI 250.6 as modified by District Details S-199 and S-200. Pocket hinges.

D. See PPS District Standard Drawing No. S-200 - Hollow Metal Door Reinforcing. Comply with ANSI/SDI 250.6 as modified by this detail.

E. 16 gauge faces, 20 gauge “Z” section vertical reinforcement 6” on center minimum.

F. 14 gauge galvanized faces at exterior, humid or corrosive atmosphere locations.

G. All voids filled with inorganic non-combustible insulation.

H. Doors swing is to be limited by wall mounted stop whenever possible. If not possible, provide bollard preferably or floor mounted if it doesn’t pose a trip hazard in that location. Provide appropriate backing with stops to ensure protection of walls and doors.

08-14-00 Interior Wood Doors

A. Doors shall comply with custom grade, Extra Heavy Duty performance in accordance with WDMA Industry Standard 1-A and AWI Quality Standards.

B. Solid core wood construction only.

C. Natural finish-white maple veneer faced.

D. Provide extra heavy duty particleboard core for lower cost and durability.

E. Edges: solid hardwood.

F. Premium grade five-ply architectural doors with stiles and rails bonded to the core by means of a thermal setting (hot press) adhesive and sanded prior to assembly of face veneers.

G. Engineered wood and/or composite products only if approved by the District Maintenance.

H. Doors swing is to be limited by wall mounted stop whenever possible. If not possible, provide bollard preferably, overhead stops or floor mounted stops if it doesn’t pose a trip hazard in that location. Provide appropriate backing with stops to ensure protection of walls and doors.

I. Ensure all doors have adequate blocking for closers, handles, locks and panic bars. Provide minimum 1” vertical stiles and 5” blocking at top and bottom rails. Provide blocks for locks at 5”x12” with blocking provided on both sides where attachment of panic bars are necessary or may be needed in the future.

J.

K. Door cores shall be documented to have low formaldehyde emissions to meet LEED standards.

L. Wood door finishes shall be selected to reduce hazardous air pollutants and volatile organic compounds. Use of factory finish systems that use only water-based stains and UV-cured topcoats.

08-31-00 Access Doors and Panels

A. Provide access doors sized for the approach and maintenance needs. See section 05-50-00 for ladder and stair requirements including locations.

1. To the greatest extent possible, provide 3’-0”x7’-0” doors in walls where staff need complete access through the wall.
2. At valves, cleanouts, junction boxes, etc, 12" x 16" (min. size) access.
3. At dampers, damper motors, fusible links, fire dampers, and circulating pumps, provide access sized to allow for the removal and maintenance of the device.
4. At duct heaters, provide access into duct for cleaning and inspection of the coils.
5. At filters, provide access sized to allow replacement of filter.
6. Coordinate access with all mechanical, electrical, plumbing and structural elements.
7. Preference is for surface mounted access panels, in lieu of flush mount, to maintain the integrity of the adjacent finishes.

B. Locks:
1. When located within student or staff accessible area, at 8’-0” elevations and lower, provide a CompX Stock Locks MFW23058-KA Cam lock or District locksmith approved equal keyed to CH802.
2. Above 8 feet and in areas not accessible to students and staff, provide flat screwdriver latch.

08-33-00 Coiling Doors and Grilles

A. Fire rated doors:
1. Automatic fire rated coiling door will close without “free fall slam”.
2. Door equipped with an automatic closing device operating from magnetic release holders connected to the building fire detector system, complete with door bottom safety edge and automatic reset UL approved fire door test system.

B. Non-rated doors:
1. Coiling doors and grilles may be most appropriate to separate building functions and allow only a portion of the building to be open.
2. Manual and motorized operation is acceptable.
3. Motorized coiling door will close without “free fall slam”.
4. 3 button, key control with constant key contact required for motorized closing.

C. Ensure required exiting is maintained.

D. Coordinate structural support as required.

E. Lock cylinders shall be Schlage E or F or EF classic keyway. No substitutes.

F. Switches with keys shall be mortise cylinder compatible without special adaptation. Schlage Electronics Key Switch series is preferred. Supply IC (Interchangeable Core) cylinders.

08-33-13 Coiling Counter Doors

A. For fire rated doors:
1. Automatic fire rated coiling door will close without “free fall slam”.
2. Door equipped with an automatic closing device operating from magnetic release holders connected to the building detector system, complete with door bottom safety edge and automatic reset UL approved fire door test system.
3. Continue rating of opening into casework below and soffit above door.
4. Examples include: “Cookson” “Overhead Door Co.” Cornell and Raynor.

B. Non-rated doors:
1. Manual and motorized operation is acceptable.

2. Motorized coiling door shall close without “free fall slam”.

C. Coordinate structural support as required.

D. Lock cylinders shall be Schlage E or F or EF classic keyway. No substitutes.

E. Switches with keys shall be mortise cylinder compatible without special adaptation. Schlage Electronics Key Switch series is preferred. Supply IC cylinders.

08-35-13 Folding Doors

A. Accordion and panel folding doors require owner approval. Coordinate with Maintenance on type selected for durability and maintainability.

08-50-00 Windows

Historic: A full window survey documenting existing window styles, types, and quantities, conditions of frame, sash, glazing, and hazardous material is strongly recommended. Any Type III Historic Review process will require such a survey for design approval prior to changes. The survey will also be useful in designing replacement windows to match historic and may also be used to evaluate the need of replacement and comparative analysis for sustainability and environmental goals. A survey is recommended for all window systems including curtain wall and punch openings and equally applicable to aluminum, wood, and steel windows.

A. Provide 3D window wrap details showing air barrier seals, sill drainage jamb, and head flashing.

B. New windows on new buildings to be aluminum or as approved by District.

C. New windows on renovations may be (Douglas fir) wood, aluminum, or steel to meet historic requirements and blend with existing fabric.

D. Wood windows and clad wood windows are discouraged on new buildings.

E. No vinyl windows are allowed. If existing vinyl windows are being partially replaced, replace with fiberglass to match existing vinyl.

F. New windows to meet 6.0 psf performance standards when tested for rain penetration with ASTM E 1105.

G. On renovations, repair or rebuild rather than replace existing wood windows when possible, see introduction to Division 08. Rebuild with fir wood, not pine.

H. Storefront windows to meet 10-psf performance standard when tested for rain penetration with ASTM E 1105.

I. Large sliding windows (greater than 10 sq. ft.) are to be avoided due to maintenance durability. Avoid tall narrow profiles.

J. Flush mounted exterior windows are not permitted.

K. 5-year warranty covering materials and workmanship.

L. Consider 4” window limiters at windows above ground floor for safety. Weigh based on height of window, ventilation requirements and egress needs.

08-60-00 Roof Windows and Skylights

A. Fixed non-operable skylights: the District encourages replacement and new installation to retain and maximize daylighting with energy efficient, durable and low maintenance skylight system.

B. Operable skylights are prohibited.

C. Roofs which are easily accessed should be evaluated for vandalism and skylight replacement type.

D. Translucent fiberglass replacement skylights are preferred due to life span, reduced maintenance, durability, medium price point, material translucence and no fall protection needed.

E. Glass skylights are allowable when budget allows and for historic significance requirements. While glass skylights are typically more expensive than fiberglass, they have the longest life spans and can require less maintenance.

F. High quality domed skylights are allowable at smaller skylight openings. Integral skylight frames shall be aluminum with integral condensation and weepage gutters which drain interior moisture to the outside. Corners shall be mitered and welded. Use dual pane acrylic glazing with silicon seal separation from frame. Factory Mutual approved #4431 tested., CC1/Class A rated. Allow for expansion and contraction within system components caused by a cycling surface temperature range of 170 degrees Fahrenheit without causing detrimental effects to system or components. Design to withstand live loads in accordance with the current OSSC. 5 year warranty required.

G. Ensure all skylights are vandal resistant and provide code required fall restraint. Avoid use into sensitive or secure rooms.

H. Air Infiltration shall meet ASTM E283.

I. Water penetration shall meet ASTM E331.

J. Structural performance shall meet ASTM E330.

08-71-00 Door Hardware

Historic: Retrofitting historic door hardware to meet accessibility requirements is feasible and encouraged when existing door hardware is part of the character defining interior feature. Conduct a full hardware inventory and survey and identify the exit pathways requiring accessibility. Existing hardware can be retrofitted via additional components, substitute components, or modification to existing components.
Reference National Park Service, Preservation Brief 32 Making Historic Properties Accessible. Thomas C. Jester and Sharon C. Park, AIA. 1993

Accessibility: When replacing hardware, replace with hardware meeting ADA requirements. This includes single operation locking mechanisms at all doors. Confirm mounting height meets ADA-AG requirements. The district prefers handles that wrap back similar to the Rhodes or Tubular models of the Schlage ND series for improved graspability.

General: Do not install battery-operated electronic locks or locks with remote activators unless activators are permanently installed and hard-wired.

For major renovation and new construction (creating a new key system), use I/C cores. Use standard cylinders for retrofit projects that make use of the current key schedule.

All existing hardware to be removed or demolished must be coordinated with District locksmith for salvage and reuse.

Non-doggable fire hardware required at fire doors.

Provide 10% overstock for Maintenance and Repair for new construction and modernizations.

All hardware warranty must be in effect at time of installation. Manufacturing date should be no later than 6 months from time of purchase from the factory.

A. Installers required to meet qualifications/certification as recommended by manufacturer.

B. Finishes
   1. In existing buildings, match existing adjacent door hardware.
   2. For new buildings, use brushed chrome 626 on locksets and US26D on panic hardware. The brushed matte finish hides fingerprints and smudges. Do not use antique bronze, oil rubbed bronze, chrome or similar shiny metals.

C. Exit Devices (Panic Bars)
   1. Design will preclude entry via wire hook or similar picking device.
   2. Von Duprin 99 series or District approved equal. Provide associated manufacturer approved power supply when electrifying exit devices. Use Von Duprin 98/99 QEL for electric exits and 99F for fire rated exits.
   3. Applications with rim devices in pairs and heavy duty, non-deflecting mullions: Von Duprin 98/99 Device with keyed removable mullion
   4. At interior hallway doors, vertical rod and mortise devices in conjunction with exit devices are not permitted except in existing conditions where required. Use Von Duprin 98/99 Less Bottom Rod.
   5. At exterior doors, cylinder dogging shall always be key driven and never allen key. Specify CDSI (cylinder dogging with security indicator).
   6. Classrooms requiring panic devices shall have thumb-turns with an indicator flag plus a sticker indicating to rotation of the thumb-turn to lock. VD 98/99-2SI with thumb turn.
   7. Concealed Hardware Not Allowed anywhere unless approved by the district locksmith.
   8. Use Von Duprin XP98/99 Devices (or District approved equal) on exterior doors. If exterior doors are doubles without mullion, use 9927 top rod and bottom rod.
   9. Use IC (Interchangeable Core) for Exits and KRM (keyed removable mullions)

D. Locksets
   1. All lock sets to have a minimum 10 year warranty.
   2. Use Schlage ND Series Vandlgard (or District approved equal) at high abuse doors.
   3. Levers shall be solid metal with no plastic inserts for durability.
   4. Keyways and key schedule to be in conjunction with existing master key system.Key schedule must be reviewed and approved by PPS Facilities and District Locksmith. See appendix.
   5. Interior locks and cylinders: Rim & mortise cylinders are FSIC with temp cores. Separate line items for perm cores.
   6. Interior (all locksets including roll up doors): “Schlage” cylinders, heavy-duty CL and ND series, key in lever, 6-pin keyway, section to match existing building type (E, F or EF) (see District Lockset Schedule for specific sites). Wrap back handle style similar to Schlage ND Rhodes (RHO) style. 06 - for mortise locks
   7. Exterior: “Best (IC)” cylinders, heavy duty, key in lever, 7-pin “J” keyway, best lever handle. Use ND92BD (Entrance Lock type), ND96JD (Storeroom Lock type) at entries and ND96BD (Storeroom function) at exterior classroom style doors.
   8. Classrooms: Entrance Lock type with Push-button locking similar to Schlage ND50PD.
   9. Administration offices: Entrance Lock type with Push -button locking similar to Schlage ND50PD.

10. Non-administrative offices: Lock type similar to Schlage ND-50PD; ND94 for custodial closet or custodial office as applicable.
11. Intercommunicating locksets (Store Lock type), i.e. door between boys and girls locker room, shall require keyed use both directions: Schlage ND66PD (for retrofit) ND66JD (for new construction).
12. Restrooms:
    a. All student restrooms will remain unlocked unless they are occupied.
    b. Multi-user Student restrooms: When designing multi-user student restrooms, District prefers no doors with staggered entry.
        i. At existing and retrofit for cylindrical lock locations provide Latch type similar to Schlage ND10S or District Approved Equal. Do not provide mortise type locks.
    c. Single-use restrooms: Provide a single action lock and handle with integral occupancy indicator, which meets ADA-AG requirements. Always free open from exterior unless in use.
        i. All-user single occupancy/use restroom Privacy lock with “Occupied” Indicator Schlage mortise L9496 06 L283-722 L583-363 with special emergency cylinder.
        ii. Staff only single occupancy/use restrooms: Privacy lock with “Occupied” Indicator Schlage mortise L9486 06 with special emergency cylinder. Key entry only
            a. Knob/lever retracts latch bolt from either side. Deadbolt thrown or retracted by key outside (retraction by key required in the event of an emergency) or inside thumb turn. Throwing deadbolt locks outside knob/lever and displays “Occupied” plate. Rotating inside knob/lever simultaneously retracts both deadbolt and latch bolt, and unlocks outside knob/lever. Inside lever is always free for immediate egress.
    d. Existing single use restrooms: ND85JD for staff only use key entry; for all-user/student single occupancy use must be retrofitted to install mortise lock with indicator due to emergency access and egress.
13. Single user restrooms accessed from the exterior (i.e. grandstands or field houses) throw open doors: “Best S function deadbolt” or District approved equal, meeting ADA-AG requirements for single action use occupancy indicator. Deadbolt key shall be compatible with building exterior master keying, yet shall not operate any other exterior lock. L9456 x L283-712. Storerooms and custodial closets: Storeroom Lock type similar to Schlage ND80PD(retrofit) or ND80JD (new construction) or District approved equal.
14. Cabinets/Display Cases:
    a. For retrofits and existing schools, Classroom cabinet type lock with removable cylinder similar to Schlage CL-1000, 777R, Olympus 777IC.
    b. Pin Tumbler Cam lock allowed in new and modernized school classroom cabinetry, common area storage & display cases.
    c. Cam Wafer lock not allowed.
15. Teacher’s personal closets: Entrance Lock with push-button on interior. Key must be used until push-button is unlocked. Unlocked from outside with key. Inside lever is always free for immediate egress. Similar to “Schlage AL53PD” lever or District approved equal.
16. Mortised locksets are prohibited except in single use restrooms.

E. Door Closers

1. Provide door closers where required by code and/or where the program dictates. Provide in conjunction with hold open tied to fire alarm where required by code.
2. Provide institutional grade, for multi-hand and multi-sized doors, which comply with ANSI standard A117.1 for minimum opening requirements.
3. Provide closers with a 10 year full warranty, 30-year limited warranty.
4. Product examples: Norton 7500 (interior), LCN 4040XP with EDA arm (or District approved equal) at high use / abuse locations. Use SRI Prime at exterior corrosive openings.
5. Provide parallel arm, surface mounted for ease of maintenance. Do not provide concealed door closers or stops.
6. Install with through bolts for improved strength and durability.
7. Heavy duty with full rack and pinion.
8. Independent closing speed and latch regulating valves.
9. Adjustable back check.
10. Back check shall engage checking action prior to 80 degree opening.
11. Closers to be adjusted on job site. Application to close and latch without excessive speed.
12. Door closers are not to be used as a means of limiting door swing.
13. Pressure required to open door to meet Accessibility requirements of 5 lb max. Confirm with door pull test on site after installation. Provide and adjustable delayed action closing when required or appropriate.
14. Finish to match other door hardware.

F. Hinges
1. Exterior: heavy-duty, ball bearing, with non-removable pins not less than 5”x 5”. Non-removable pin hinge.
2. Interior: heavy-duty, Ball bearing not less than 4.5” x 4.5”. Non-removable pin hinge.
3. Doors 40” x 90”and smaller are to receive 3 hinges.
4. Doors greater than 40” wide are to receive 4 hinges.
5. Doors greater than 90” in height are to receive 4 hinges.
6. Example Manufacturers: “Lawrence CB”, “Stanley FBB”.

G. Astragals, Vertical Rods & Mullions
1. Astragals are not permitted. Removable mullions are preferred. Use Von Duprin KRM (Keyed Removable Mullion) I / C CORES
    a. All mullions to be keyed on interior key only (no exterior) GGM/GM. LFIC (Large format interchangeable core)
2. Use vertical rods at interior corridor doors; no mullions due to trip hazard.

H. Gaskets
1. Perimeter gasketing with silicone gasket attached with stainless steel fasteners and fully adhered similar to “Pemko 303_S” or District approved equal.

I. Door Position Switches
1. Door position switches with request to exit devices are required on all exterior doors and interior doors with access control at new and renovated schools. See Division 28 for access control requirements and coordination.

J. Kick plates

1. Provide kick plates at primary entrances and exits including those to/from play areas, and at major gathering spaces such as cafeterias, auditoriums. Kick plates are not required on aluminum doors.
2. 18 gauge stainless steel, 10 inches high.
3. 2 inches less than the width of door.
4. Center in door opening.
5. Secure with #6 x 5/8 truss head stainless steel screws.
6. ½ inch reveal at bottom of door.

K. Armor Plates
1. Provide full door wrapped, minimum 12" tall, armor plates at kitchen areas, gymnasiums, locker rooms, doors which egress to trash area, custodial closets and storage rooms.

L. Coordinators
1. Provide 3/16" backing for jamb-mounted devices. See PPS District Standard Drawing No. S-199.

M. Wall Stops
1. Provide convex rubber bumper when handle does not have a projecting button and concave when it does.
2. Example is "Ives WS401CVX or WS401CCV" or District approved equal.
3. Finish to match adjacent hardware.
4. Provide backing behind all wall stops.

N. Floor Stops
1. Avoid floor stops, as they present a tripping hazard and are problematic when cleaning or waxing floors. Ensure these issues are addressed if required.

O. Electronic Strikes
1. See division 28 for Electronic Strikes.

P. Magnetic Hold Opens to be provided at all gathering spaces such as cafeterias, gymnasiums, and auditoriums.

08-71-13 Automated Door Operators

A. Power Assisted Doors, See also Division 28-00-00 for Access Control requirements.
1. Power assisted doors to be provided for accessible main entrances and remote ADA entries where proper clearances and/or weight of door prohibit compliance with ANSI 117.1 standards.
2. All power assisted doors to receive access control requirements. See 28-00-00.
3. Operator to be low energy. Norton 6000 series, LCN 4600 series and associated actuators and switches or District approved equal.
4. Paddle – Provide flush mounted, hard wired switch with graphic ADA symbol similar to "Norton 502 switch" or District approved equal.
5. Heavy duty single plunger push button switch with separate graphic ADA symbol such as 'REES 01371' or approved equal.
6. Electrical box to be weather and rain tight similar to "Red Dot", "Bell" or District approved equal.
7. 24 VDC separate power supply.
8. 30-50 pound pull to release from electro magnet.
9. Tied to FACP relay.

08-71-53 Access Control - See Division 28

08-81-00 Glazing

A. General Notes
   1. Label showing glass manufacturer's identity and type of glass.
   2. Safety glazing to meet the requirements of current code/Section 2406 of the OSSC.
   3. Laminated glazing preferred at:
      a. Ground floor/ground accessible doors/windows as a security measure over tempered
      b. Adjacent to playgrounds
      c. Areas prone to vandalism/break-in
   4. Tempered glazing – At locations required by code.
   5. Wired glass is no longer allowed by code. Renovation projects should remove existing wire glass in occupied areas to the greatest extent possible.
   6. All glass in the District to be: minimum 32" above floor. The district discourages use of glass walls as they do not provide privacy to the lower half of the body and limits placement of bookshelves and other furniture. Connection between rooms can be achieved through just upper glazing. The exception would be exterior glazing connected to open areas such as corridors, lobbies, and commons.
   7. No single strength glass allowed.

B. Laminated Safety Glass-Clear:
   1. Typical composition: Two layers 3 mm (1/8 inch) clear tempered safety glass, 0.030 inch thick polyvinyl butyral interlayer.
   2. Heat strengthened.

C. Low-E Glazing Units:
   1. High performance Low-E coating on No. 2 surface of insulated units.
   2. Properties may vary depending on solar orientation and use of fixed shading.
   3. Specify properties in coordination with energy model and/or envelope analysis. Unless variations to the following is supported by an energy model specific to the overall building design, properties shall include the following or better:
      a. Visible Transmittance: Min 60%.
      b. Solar Heat Gain Coefficient: Max 0.40. (On occasion a space may be designed intentionally for a higher SHGC due to seasonal usage patterns and desire for a space to have heat gain as part of the passive solar design. This should be carefully considered as part of an entire system.)
      c. Winter U value: max.0.30
      d. Summer U value: max. 0.30

D. Example Products:
   1. Guardian SNX 62/27
   2. PPG Solarban 70
   3. Viracon VNE 1-63

E. Showcase Glazing
   1. Minimum 1/4" thick.
   2. Laminated or tempered safety glass.
   3. 12 sq. ft. maximum.
   4. Shelves: safety glass or non-glazing material. 12" maximum depth. For glazed material, provide laminated glass comprised of a min. 2 layers of 4.4 mm tempered safety glass with a 0.060 interlayer.

F. Relite Glazing
   1. Removable stops.
   2. Glazing tape at all relites.
G. Glazing Compound at historic windows
   1. Exterior metal sash-elastic type for bedding glass
H. Glazing Tape
   1. Closed cell foam as recommended by glass manufacturer.

08-83-00 Mirrors

A. Provide safety glazing per Section 2406 of OSSC for all mirrors.
B. ASTM C 1503, Mirror Glazing Quality, silvered flat glass mirror, nominal ¼" (6.0 mm) thick, tempered glass with stainless steel frame.
   1. Alternative: Clear annealed glass with adhesive backed polyethylene material backing, ¼" (6mm) thick to hold glass in place when broken.
   2. Ensure tempered glass does not distort at larger sized mirrors.
C. Consider easy handling size for ease of replacement when broken.
D. Mechanically attach all mirrors. Do not fully adhere. Provide concealed fastenings.
E. Frames: Type 304; satin finish stainless steel, 14 gauge seamless construction.
F. Install at ADA-AG heights and locations.
G. Mirrors with integral shelves are prohibited in student restrooms.