08 00 00 - Openings

08 00 00 General Information

Architects, in the design of project specific building enclosure systems, shall consider the unique characteristics of the generally hot-humid environment of Conway, SC. Attention to high wind risks and corrosion potential should also be considered.

Architects and Engineers are responsible for proper selection of materials in each building system for specific projects; these standards do not relieve the designer from that responsibility.


Note: Revolving doors and automatic sliding doors are not preferred by the University. Please review with the CCU Project Manager before including these products in new projects.

Note: The preference of the University is that doors not exceed 8'-0" in height.

Note: The preference of the University is that doors not exceed a thickness of 2-1/4" as larger doors are harder to open and present more maintenance concerns. The Architect should discuss the desire to use thicker doors with the CCU Project Manager.

Note: For all aluminum entrance door, storefront, window and curtain wall installations, CCU representatives shall perform a walk-through to assure quality work, quality installation and quality products are being provided.

08 11 13 Hollow Metal Doors and Frames

Interior and exterior steel doors and steel frames.

Products:

Interior Doors: Level 2, Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
Interior Frames: Cold rolled, factory welded frames, Level 2, shop primed.

Exterior Doors: CCU preference is for FRP exterior doors at high traffic areas (see 08 17 43) if conditions prohibit use of FRP door, use Level 3, Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless).
Exterior Frames: Cold rolled, factory welded, seamless, Level 3, shop primed.

08 14 16 Interior Flush Wood Doors

Certification: AWI

Solid-core (stranded core, not particle core) doors with wood veneer faces with factory finish, and factory machining for hardware.

Products: Marshfield-Algoma Hardwoods, Eggers Industries,
Custom Grade A face, 5 Ply, Birch Plain Sliced, Book Match (between leaves), Balance Match (door faces). Premium transparent finish AWI TR-6 catalyzed polyurethane. Heavy Duty Performance Grade

08 17 43 Exterior Flush FRP Doors
Doors with fiberglass reinforced polyester faces with integral factory finish, and factory machining for hardware.
Products: Special-Lite SL-17 or equal. Door thickness minimum 1-3/4”; aluminum extrusions; mitered corners; Class I anodized finish; tested for hurricane ratings; heavy abuse doors. textured

08 33 23 Overhead Coiling Doors (Service and Counter Doors)
Products: Cookson, Cornell, KcKeon, Overhead Door, Wayne-Dalton.
Service Door: Overhead Door Model 525, steel flush panel, Manual chain hoist operator. Manufacturer’s standard two coat color options. Doors must be selected to meet thermal requirements, wind load requirements and impact resistance requirements. 10 year limited warranty on steel face, 3 year or 20,000 cycles for all other components
Counter Door: Overhead Door Model 652, Aluminum (clear anodized), Manual operator. 24 month limited warranty

08 41 13 Aluminum Entrances and Storefronts
Exterior aluminum framed storefronts, and manual swing aluminum doors and frames.
Products: EFCO, Kawneer, TRACO, YKK. Coral AP.
Storefront: Hurricane resistant Kawneer IR 501T thermal framing system with insulating impact resistant glazing
Doors: Hurricane resistant Kawneer 500IR Wide Stile Door with impact resistant glazing
   Minimum 10" bottom rail; 7.5" top rail; 5" wide stiles, welded door construction
   CCU preference is for FRP exterior doors at high traffic areas (see 08 17 43).
Finish: Architectural aluminum finish to be manufacturer’s standard 2-coat Kynar Paint as selected from manufacturer’s standard paint chart.
Warranty: Standard 10 year paint warranty on 2-coat paint.

08 44 13 Glazed Aluminum Curtain Walls
Exterior glazed aluminum curtain walls.
Products: EFCO, Kawneer, TRACO, YKK, Coral AP
Curtain wall: Hurricane resistant Kawneer 1600 System 1
Finish: Architectural aluminum finish to be manufacturer’s standard 2-coat Kynar Paint as selected from manufacturer’s standard paint chart.
Warranty: Standard 10 year paint warranty on 2-coat paint.
08 51 13 Aluminum Windows

Exterior aluminum windows. Single hung if operable.

Products: EFCO, Kawneer, TRACO, YKK, Coral AP

Window: Kawneer 8400 TL Series

Finish: Architectural aluminum finish to be manufacturer’s standard 2-coat Kynar Paint as selected from manufacturer’s standard paint chart.

Warranty: Standard 10 year paint warranty on 2-coat paint.

08 71 00 Door Hardware

The Architect shall select hardware with functionality in mind. It is the responsibility of the Architect to review all proposed hardware and submit hardware specification to CCU for review during the design phase. Also review hardware submittal during construction phase with the Project Manager who will coordinate a review with the campus locksmith.

The Owner’s Representative, the GC, the Hardware Supplier, the Electrical Contractor, the Cbord representative, the Hardware Consultant, and the Architect shall attend the electrified hardware/access control pre-install meeting. This meeting shall be held prior to the commencement of the electrical rough-in.

Conduct onsite keying meeting to include Owner’s representative, Contractor, hardware supplier, and Best Lock manufacturer’s representative.

Note: Concealed or recessed door closers are not preferred by the University.

General Requirements:

1. Hardware shall be of best grade, entirely free of imperfections in manufacture and finish, and shall satisfactorily perform various functions needed.

2. Furnish necessary screws, bolts or others fastenings of suitable size and type to anchor hardware in position and match hardware as to material and finish. Provide Phillips flat-head screws except as otherwise indicated.

3. Verify use of through-bolts for closer/exit device installations where bolt head or nut opposite face is exposed in other work. Use of sex bolts shall be allowed, as required by the door manufacturer for compliance with fire door certification.

4. Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as indicated. Items of hardware not definitely specified, but needed for satisfactory installation of hardware shall be provided. Such items shall be of type and quality suitable for service needed and comparable to adjacent hardware.

5. Where items of hardware are not specified or correctly specified, and are required for completion of the project, submit a written statement of each error, omission, or discrepancy to the Architect 14 days prior to the bid date for clarification to be included in an addendum.

6. Finishes shall comply with ANSI A156.18/ BHMA 1301. Finish designations cross references shall be as follows:
Substitutions:
Manufacturers and model numbers listed are to establish a standard of quality and design. The architect must approve all product substitutions. Any request for substitutions must be submitted 14 days before the bid date, to allow sufficient time for an addendum to be added to the bid document. In accordance with Section 016000, required data and physical samples must be provided to the architect for review.

Hinges

A. Butt Hinges: ANSI/ BHMA A156.1

1. Provide full mortise, template, 5-knuckle, button tip hinges with non-rising loose pins and ball type bearings.

2. Out-swinging exterior doors shall be furnished with stainless steel, hinges with non-removable pins.

3. Interior doors with locksets shall be furnished with non-removable pins hinges.

4. Hinges shall be furnished in following quantities:
   a. Doors up to 90” in height: 3 hinges
   b. Doors over 90” in height: Add 1 hinge for every additional 30”

5. Furnish hinge sizes not less than as follows:
   a. For 1 3/4” Thick Doors: Standard weight
      (1) Doors up to 3’-0” wide: 4 1/2 x 4 1/2 x 0.134 gauge
      (2) Doors 3’-0” to 4’-0” wide: 5 x 4 1/2 x 0.146 gauge
   b. For 1 3/4” Thick Doors: Heavy weight
      (1) Doors up to 3’-0” wide: 4 1/2 x 4 1/2 x 0.180 gauge
      (2) Doors 3’-0” to 4’-0” wide: 5 x 4 1/2 x 0.190 gauge

6. Furnish hinges of sufficient throw where needed to clear trim or permit doors to swing 180 degrees.

7. Finishes:
   a. Exterior Doors: BHMA #630 (US32D)
b. Interior Doors: BHMA #652 (US26D)

8. Acceptable Manufacturers:

<table>
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<th>Stainless Steel</th>
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<tr>
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<td>b. Hager:</td>
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<td>c. Ives:</td>
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<td>d. McKinney</td>
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9. Acceptable Manufacturers:

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<td>c. Ives:</td>
<td>5BB1HW 5BB1HW</td>
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<td>d. McKinney</td>
<td>T4B3786 T4B3386</td>
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B. Geared Continuous Hinges: ANSI/ BHMA A156.26 Grade 1

1. Provide full mortise, non-handed, full height hinges with interlocking cover and symmetrically templated hole pattern made from extruded aluminum.

2. Finish: BHMA #628 (US27)

3. Acceptable Manufacturers:
   a. Hager: 780-112 HD
   b. Ives: 112HD
   c. Select: SL-11HD

Locksets and latch sets

A. General Requirements:

1. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching, or twisting of wrist.

2. Locksets and latch sets shall not require more than 15 lb. to release latch. Locks shall not require use of a key, tool, or special knowledge for operation.

3. Provide manufacturer’s standard wrought box strike for each latch set and lockset with curved lip extended to protect frame without catching clothing. Finish shall match hardware set.

4. Provide all locks and cylinders with keyed construction core. Key system shall be 7-pin to match the Owner’s existing Best key system.

B. Cylindrical Locksets and Latch sets: Heavy duty

1. Provide cylindrical locksets and latch sets that comply to ANSI A156.2, Series 4000, Grade 1; tested to exceed 3,000,000 cycles. Functions as listed in Hardware Sets.

2. Locks shall meet ANSI A117.1, Accessibility Code.

3. Locks shall meet UL A label; to have a minimum listing for single doors 4’ x 8’.
4. Locks shall have the ability to incorporate either a rigid or free-wheeling lever when in a locked mode and chassis shall be field changeable.

5. Levers shall be independent and bi-directional.

6. Levers shall be solid. Manufacturers utilizing lever fillers are not acceptable.

7. Lock chassis shall be a one-piece, multifunctional modular assembly that provides for interchange of lock function without disassembly of the lockset.

8. Stamped spindles are not acceptable.

9. Spindle and spring cage shall be a one piece integrated assembly.

10. Locks shall have field reversible handing.

11. Latch bolt to be steel with minimum ½” throw dead latch on keyed functions; ¾” anti-friction dead latch on pairs of doors.

12. Strikes to be 16 gage, with 1” deep box construction, curved lip of sufficient length to clear trim and protect clothing.

14. Acceptable Manufacturers:

C. Mortise Locksets and Latch sets:
   1. Provide heavy duty mortise locksets and latch sets that comply to ANSI A156.13, Series 1000, Grade 1 Operational. Functions as listed in Hardware Sets.

   2. Locksets shall be manufactured from heavy gauge steel, 1/8” minimum lock case thickness, containing components of steel with a Zinc dichromate plating for corrosion resistance.

   3. Locksets are to have a standard 2 3/4” backset with a full 3/4” throw. Deadbolt shall be a full 1” throw, constructed of stainless steel.

   4. Lock shall be easily handed without opening the lock case.

   5. Lock trim shall be through-bolted to door to assure correct alignment a proper operation.

   6. Finish: BHMA #626 (US26D) / #630 (US32D)

   7. Acceptable Manufacturers:
   a. Best Lock: 40H Series with 15J lever design.

Exit devices

A. Exit Devices: ANSI/ BHMA A156.3, Grade 1
   1. Exit devices shall be listed by UL for accident and hazard. Devices shall conform to applicable requirements of NFPA 80 and NFPA 101.

   2. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching, or twisting of wrist.

   3. Exit devices shall not require more than 15 lb. to release latch. Locks shall not require use of a key, tool, or special knowledge for operation.
4. Exit devices mounted on labeled wood doors shall be through-bolt mounted in compliance with door manufacturer’s requirements. Do not through-bolt if there has been special blocking specified in wood door specification; refer to Section 08210.

5. Furnish filler plates and shim kits as needed for flush mounting of devices on doors.


7. Devices shall have dead latching feature to prevent latch bolt tampering. Devices shall have roller type strikes.

8. Lever trim shall be heavy-duty type fastened by means of concealed welded lugs and through-bolts from inside.

9. Lever trim shall be designed with a breakaway feature to allow trim to freely rotate while remaining securely locked, preventing damage to internal lock components from vandalism by excessive force.

10. Finish: BHMA #626 (US26D)

11. Acceptable Manufacturers:

Door closers

A. General Requirements:
   1. Closers shall be sealed and filled with all-weather fluid. Provide stable hydraulic fluid to withstand a temperature range of 120 degrees F to minus 30 degrees F.

   2. Size closers in compliance with requirements for accessibility for handicapped and recommendations of manufacturer. Provide barrier free and delayed action features as needed. Comply with following maximum opening-force requirements:
      a. Interior Hinged Doors: 5.0 lbs.
      b. Exterior Hinged Doors: 8.5 lbs.
      c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction

B. Surface Closers: ANSI/ BHMA A156.4, Grade 1
   1. Surface mounted closers shall be full rack-and-pinion type closer with full complement bearings, single piece forged piston, chrome silicon steel spring, non-critical screw valves; back check, sweep and latch.

   2. Furnish closers complete with rectangular, non-ferrous covers, necessary brackets and fasteners for top of door surface mounted units.
      a. Finish: BHMA #689 BRT Brite Metallic Power coat

   3. Closer products with any type of pressure relief valve system shall not be acceptable.
4. Closers shall be ISO 9000 certified. Units shall be stamped with date of manufacturer code.

5. Non-sized closer to be independent lab tested for 10,000,000 cycles.

6. Closers shall be non-sized, field adjustable from size 1 to 6. Closers shall handing specific.

7. Furnish closers with 1 1/2” diameter piston.

8. Through-bolt all closers, unless otherwise directed by the architect.

9. Locate closers on interior side of exterior doors and on non-public side of interior doors, unless otherwise specified.

10. Provide manufacturers heaviest duty arm available at doors scheduled with parallel arm applications.

11. Provide plates, brackets and special templates when needed for interface with particular header door and wall conditions and adjacent hardware.

12. Closers shall be tested to 100 hours of salt spray test in compliance with ASTM B117; furnish data on request.

13. Closer arms shall be heavy duty forged. Provide extra-duty arms (EDA) at doors scheduled with parallel arm applications.

14. Acceptable Manufacturers:
   LCN
   4011
   4111EDA
   4111-SCUSH
   4111 HSCUSH

C. Automatic Door Operators: Electro-hydraulic ANSI A156.19:

1. Power door operator shall conform to ADA law, section 4.13.12; ANSI A117.1.

2. System is completely electromechanical. The control box/motor/gear box shall be contained in an aluminum housing.

3. Furnish system complete with components necessary for proper installation, including, actuators at each side of door, connectors, wiring, on/off switch and other components as needed.

4. Unit to have a built-in power supply with maximum output load of 1.0 amperes @ 12VDC or 24VAC.

5. Both high voltage and low voltage output circuits to be protected by electronic circuit breakers that will reset to normal operation after a fault is corrected. The use of replaceable fuses is not acceptable.

6. Coordination of power operator and security hardware shall be the responsibility of the power operator supplier and installer.


8. Wall Push-Plate Switch:
a. Provide manufacturer’s standard semi-flush, wall mounted, door control switch; consisting of round or square, flat push plate; of material indicated; and actuator mounted in recessed junction box.

9. Provide engraved symbol as indicated.
   a. Operator at exterior and vestibule applications shall be interconnected and operator

Flush bolts

A. Flush bolts: ANSI/ BHMA A156.16
   1. Provide minimum 1/2" diameter rods of brass or stainless steel, with minimum 12" long rods for doors up to 7'-0" in height. Provide longer rods as needed for doors exceeding 7'-0" in height.
   2. Provide dustproof strikes for bottom flush bolt applications, except where special threshold construction provides non-recessed strike for bolt.
   3. Finish: BHMA #630 (US32D)
   4. Acceptable Manufacturers:
      a. Ives: FB458
      b. Rockwood: 555
      c. Trimco: 3917
      d. Burns

B. Combination Flush bolts: ANSI/ BHMA A156.16
   1. Provide combination flush bolts using two automatic flush bolts for top and bottom of the door. When active leaf is opened flush bolts are opened. Automatic flush bolts engages each time inactive leaf is closed.
   2. Provide dust-proof strikes for bottom flush bolt applications.
   3. Finish: BHMA #630 (US32D)
   4. Acceptable Manufacturers: (wood doors)
      a. Ives: FB41P
      b. Rockwood: 1945
      c. Trimco: 3815
      d. Burns
   5. Acceptable Manufacturers: (hollow metal doors)
      a. Ives: FB31P
      b. Rockwood: 1845
      c. Trimco: 3810
      d. Burns

Push Plates, Pull Bars, and Grips

A. General Requirements: ANSI/ BHMA A156.6
Coastal Carolina University Design Guidelines

Openings

1. Provide concealed mounting where possible. Where exposed fasteners are used, they shall be countersunk.

2. Push plates shall be beveled.

3. Where applicable plates shall be prepared to receive cylinder locks or thumb turns as scheduled.

4. Finish: BHMA #630 (US32D)

B. Push Plates:
   1. Size: 4" x 16"
   2. Thickness (US GA): 18 gauge; .050"
   3. Acceptable Manufacturers:
      a. Trimco
      b. Ives: 8200
      c. Rockwood: 70C
      d. Burns

C. Pulls: Offset 8190-18"
   1. Size: 1" diameter
   2. Mounting: 18" center-to-center
   3. As manufactured by Ives; Trimco; Rockwood, Burns

Door Protection Devices

A. General Requirements: ANSI/ BHMA A156.6
   1. Fabricate protection plates (armor, kick, or mop) not more than 2" less than door width on stop side and not more than 2" less than door width on pull side, x height indicated.
   2. Protection plates shall be beveled on three edges.
   3. Furnish protection plates for concealed mounting where possible. Where exposed fasteners are used, they shall be countersunk.
   4. Metal Plates: Stainless steel
      a. Thickness (US GA): 18 gauge; .050"
   5. Finish: BHMA #630 (US32D)

B. Kick Plates:
   1. Size: as specified, 2" less door width
   2. Acceptable Manufacturers:
      a. Trimco
      b. Ives: 8400
      c. Rockwood

C. Armor Plates:
Coastal Carolina University Design Guidelines

1. Size: 36”
2. Acceptable Manufacturers:
   a. Trimco
   b. Ives: 8400
   c. Rockwood

Overhead stops and holders

D. Surface Mounted Overhead Holders/Stops: ANSI/ BHMA A156.8
   1. Description: Heavy-duty and Standard-duty extruded brass, bronze or stainless steel stop/holders with shock absorber, as specified. No plastic parts.
   2. Finish: BHMA #630 (US32D)
   3. Acceptable Manufacturers:
      a. GJ: 90/410/450 Series
      b. Rixon: 9/2/10 Series

Seals and Gaskets

A. General Requirements: ANSI/ BHMA A156.22
   1. Except as otherwise indicated, provide weatherstripping at each edge of every exterior door leaf.
   2. Where positive pressure labeling is required surface applied intumescent, on either the door or frame is unacceptable.
   3. Screw-on type weatherstrip on frames is unacceptable.
   4. Acceptable Manufacturers:
      a. NGP
      b. Pemko
      c. Zero

Thresholds

A. General Requirements: ANSI/ BHMA A156.21
   1. Except as otherwise indicated provide standard threshold units of type, size and profile as shown or scheduled.
   2. Metal: Extruded aluminum; 6063-T5 alloy
      a. Finish: Clear anodized; BHMA #628 (US27)
   3. Provide thresholds that are 1” wider than depth of frame.
   4. Acceptable Manufacturers:
      a. NGP
      b. Pemko
      c. Zero
Auxiliary Hardware

A. Silencers: ANSI/ BHMA A156.16
   1. Furnish tamper proof resilient cushions designed to absorb shock and noise at
      openings without gaskets.
   2. Provide 3 silencers per single door, and 2 for pairs of doors.
   3. Acceptable Manufacturers:
      a. Trimco
      b. Ives: SR64
      c. Rockwood: 608

B. Wall Bumpers: 2 1/2” diameter; 1” nominal projection
   1. Finish: BHMA #626 (US26D)
   2. Acceptable Manufacturers:
      a. Trimco
      b. Ives: WS401CVX
      c. Rockwood: 403
      d. Burns

C. Interior Floor-Mounted Stops: Dome stops with risers; 1” height
   1. Finish: BHMA #626 (US26D)
   2. Acceptable Manufacturers:
      a. Trimco
      b. Ives: FS436/438
      c. Rockwood: 441
      d. Burns

Cylinders, Keying Systems and Key Control

A. General Requirements:
   1. Meet with Architect and Owner to finalize keying requirements and obtain keying
      instructions in writing. Keying schedule shall be established in compliance with
      specific requirements determined in consultation with Owner.
   2. Provide keyed construction cores construction period. Construction cores shall
      not be part of the Owner’s existing key system. Permanent keys and cores shall
      be furnished to Owner’s Representative prior to occupancy. Owner or Owner’s
      Security Agent shall install permanent keyed cores.

B. Cores:
   1. Permanent keyed cores shall be keyed by Best Access System and configured
      into sets or subsets, master keyed or great grand master keyed as directed by
      Owner.
   2. Permanent keys and cylinders shall be marked with applicable blind code for
      identification. These visual key control marks or codes shall not include actual
      key cuts.
Coastal Carolina University Design Guidelines

a. Key and cylinder identification stamping shall be approved by Architect and Owner. Failure to properly comply with these requirements shall be cause for replacement of cylinders and keys involved at no additional cost to Owner.

C. Key Material:
   1. Provide manufacturer’s standard embossed keys of nickel silver to ensure durability. Key Quantity: Furnish keys in following quantities:
      a. Master Keys: 6 per master group
      b. Change Keys:
         (1) Locks Keyed Alike: 4 per set
         (2) Locks Keyed Different: 3 per lock
      c. Key Blanks: one extra key blank per cylinder.
      d. Temporary Construction Keys: 6 total
      e. Permanently inscribe each key with a visual key control number and include the following notation: “DO NOT DUPLICATE”.
      2. Deliver end user exclusive permanent key blanks and other security keys directly to Owner’s representative from manufacturer by secure courier, return receipt requested. Failure to properly comply with these requirements shall be cause for replacement of cylinders and keys involved at no additional cost to Owner.

D. Acceptable Manufacturers:
   1. Cores and Keys: Best Access System, keyed to Owner’s existing key system.

Accessory Hardware

Key Cabinet: not required.

Key Keeper (knox box): Recessed mounted. Satin aluminum; American Postal: KK Series; Model #N1004652; Bommer: 5622; Salsbury Industries: 1095

Coordinate location with CCU Fire Marshall.

Automatic Door Openers:

See also division 28 Electronic Safety and Security.

08 80 00 Glazing

For Doors, Windows, Glazed Entrances and Curtainwalls select glass that will optimize energy performance. As a minimum design standard consider the following. Architect will have ultimate responsibility for glazing selection.

East and North Facing Walls: Low-E, Impact Resistant Insulating-Glass Units.

   Overall Unit Thickness: 1-5/16 inch.

   *At exterior hurricane impact doors, provide 9/16” maximum infill thickness panel.

   Thickness of Outdoor Lite: 6.0 mm.
Outdoor Lite: Heat-strengthened float glass; fully tempered where indicated on the drawings.
Interspace Content: Air. 13 mm air space
Thickness of Indoor Lite: 6.0 mm
Indoor Lite: Class 1 (clear), laminated (impact resistant) glass.
Low-E Coating: Pyrolytic on second surface.
Visible Light Transmittance: 70 percent
Winter Nighttime U-Factor: 0.29
Summer Daytime U-Factor: 0.27
Solar Heat Gain Coefficient: 0.37
Shading Coefficient: 0.45
Light to Solar Heat Gain: 1.83 minimum.
Outdoor Visible Light Reflectance: 11 percent
Basis-of-Design Product: PPG Industries; Solarban 60.
Approved alternate manufacturers: Old Castle Glass, Trulite, AGC
Warranty: Provide 10 year warranty on Insulated Impact glass and 10 year warranty on lamination.

South and West Facing Walls: Low-E, Impact Resistant Insulating-Glass Units.
Overall Unit Thickness: 1-5/16 inch.
*At exterior hurricane impact doors, provide 9/16” maximum infill thickness panel.
Thickness of Outdoor Lite: 6.0 mm.
Outdoor Lite: Heat-strengthened float glass; fully tempered where indicated on the drawings. Starphine (ultra-clear) on second surface
Interspace Content: Air. 13 mm air space
Thickness of Indoor Lite: 6.0 mm
Indoor Lite: Class 1 (clear), laminated (impact resistant) glass.
Low-E Coating: Pyrolytic on second surface.
Visible Light Transmittance: 64 percent
Winter Nighttime U-Factor: 0.28
Summer Daytime U-Factor: 0.26
Solar Heat Gain Coefficient: 0.27
Shading Coefficient: 0.32
Outdoor Visible Light Reflectance: 12 percent
Light to Solar Heat Gain: 2.30 minimum.
Basis-of-Design Product: PPG Industries; Solarban 70XL Starphire.
Approved alternate manufacturers: Old Castle Glass, Trulite, AGC
Warranty: Provide 10 year warranty on Insulated Impact glass and 10 year warranty on lamination.