SECTION 088853 - SECURITY GLAZING

1.GENERAL

1. SUMMARY

A. Section includes glass-clad polycarbonate for the following applications:

1. Security Windows

2. DEFINITIONS

A. Glazing Manufacturers: Firms that produce primary glass, monolithic plastic glazing, or fabricated security glazing, as defined in referenced glazing publications.

B. Interspace: Space between lites of insulating security glazing.

3. COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on security glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

4. PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Cass County Jail, 321 M-62, Cassopolis, MI, 49031 with all sub contractors to be involved with the installation, a Sheriff’s Department/ Jail Representative, the Architect and the Owner’s Representative.

1. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
2. Review temporary protection requirements for security glazing during and after installation.
3. Review access requirements and security plan.

5. ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Security Glazing Samples: For each type of security glazing; 12 inches square.

C. Glazing Accessory Samples: For sealants and spacers, in 12-inch lengths.

D. Security Glazing Schedule: List security glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of security glazing and construction that receives security glazing, including clearances and glazing channel dimensions.

E. Delegated Design Submittal: For security glazing indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

6. INFORMATIONAL SUBMITTALS

A. Qualification Data: For installers, glazing testing agency and sealant testing agency.

B. Product Certificates: For each type of product indicated, from manufacturer.

C. Product Test Reports: For each type of security glazing, for tests performed by a qualified testing agency.

D. Product Test Reports: For each type of glazing sealant, for tests performed by a qualified testing agency.

1. Provide test reports based on testing current sealant formulations within previous 36-month period.

E. Pre-construction adhesion and compatibility test reports.

F. Sample Warranties: For special warranties.

7. QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating Security Glazing Units with Sputter-Coated, Low-E Coatings: A qualified insulating glazing manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glazing installers for this Project who are certified under the National Glass Association Glazier Certification Program.

C. Security Glazing Testing Agency Qualifications: Subject to compliance with requirements, testing agency is one of the following:

1. Intertek Group plc.
2. Underwriters Laboratories, Inc.
3. Wiss, Janney, Elstner Associates, Inc.

D. Sealant Testing Agency Qualifications: Qualified in accordance with ASTM C1021 for testing indicated.

E. Mockups: Build mockups on-site to verify installation and selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Install security glazing in one existing opening
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

8. PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each security glazing type, tape sealant, gasket, glazing accessory, and glazing-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing will not be required if data based on previous testing of current sealant products and glazing materials match those submitted.
2. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to security glazing, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.

9. DELIVERY, STORAGE, AND HANDLING

A. Protect security glazing and glazing materials in accordance with manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.

1. If makeup is not symmetrical, provide removable label indicating impact-threat-surface face. Remove label after Final Inspection.

B. Comply with insulating security glazing manufacturers' written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

C. Storage:

1. Schedule shipment delivery for crated glazing to be stored in a dry maintained interior space on site for 30 days maximum.
2. Shipments stored longer than 30 days on site are to be placed in a controlled environment.

D. Handling:

1. Remove glazing from crates only when ready for installation.
2. Remove glass from front of the crate; never by sliding out from sides.
3. On security glass, pay particular care and attention to exposed polycarbonate faces.
4. Store glazing on cushioned surfaces only.
5. Remove protective removable sheets from exposed polycarbonate immediately after installation as exposure to sunlight can bake protective film to glazing.
6. Do not rest other materials against glazing or glazing crates.

10. FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

11. WARRANTY

A. Manufacturer's Special Warranty for Glass-Clad Polycarbonate: Manufacturer agrees to replace glass-clad polycarbonate that deteriorates within specified warranty period. Deterioration of glass-clad polycarbonate is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning glass-clad polycarbonate contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through any portion of the glazing, blemishes exceeding those allowed by referenced glass-clad polycarbonate standard, yellowing, and loss of light transmission.

1. Warranty Period: Five years from date of manufacture and transferred to Owner on date of Substantial Completion.

2.PRODUCTS

1. MANUFACTURERS

A. Source Limitations for Security Glazing: Obtain security glazing from single source from single manufacturer using the same types of lites, plies, interlayers, and spacers for each security glazing type indicated.

B. Source Limitations for Glazing Sealants and Gaskets: Obtain from single source from single manufacturer for each product and installation method.

2. PERFORMANCE REQUIREMENTS

A. General:

1. Installed security glazing shall withstand normal thermal movement and wind and impact loads without failure, including loss or breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing; or other defects in construction.
2. Installed security glazing shall withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.

B. Delegated Design: Engage a qualified professional engineer to design security glazing system.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated.

1. Design Procedure for Glass: ASTM E1300 and ICC's International Building Code.
2. Design Wind Pressures: Determine design wind pressures applicable to Project in accordance with ASCE/SEI 7, based on heights above grade indicated on Drawings.

a. Calculated Design Loads : as calculated by qualified Engineer or licensed professional.

b. Basic Wind Speed: 100 mph
c. Importance Factor: CLASS III, factor of 1.15.
d. Exposure Category: B.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glazing framing members and glazing components.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

3. SECURITY GLAZING, GENERAL

A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use.

B. Thermal and Optical Performance Properties: Provide security glazing with performance properties specified, as indicated in manufacturer's published test data, based on construction products indicated and on procedures indicated below:

1. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on LBNL's WINDOW 7 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar-Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on LBNL's WINDOW 7 computer program.
3. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

4. POLYCARBONATE SECURITY GLAZING

A. Glass-Clad Polycarbonate: ASTM C1349.

5. GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they contact, including security glazing, seals of insulating security glazing, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and security glazing manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Sealant shall have a VOC content of 250 g/L or less.
4. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of

Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range, and compared to existing units on-site.

B. Security Sealant: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with low movement complying with ASTM C920, Grade NS, Class 12.5 or 25, Use NT, and with a Shore A hardness of at least 45 when tested in accordance with ASTM C661.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:

a. BASF Corporation.
b. Pecora Corporation.

6. GLAZING TAPES

A. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

7. MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of security glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Silicone- and polycarbonate-compatible, elastomeric material, with a Shore, Type A durometer hardness of 85, plus or minus 5.

1. Length: 0.1-inch- (2.5-mm-) long per square foot of glazing but not less than 4 inches (102 mm) total.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by security glazing manufacturer to maintain security glazing lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit security glazing lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

8. FABRICATION OF SECURITY GLAZING

A. Fabricate security glazing in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of

product manufacturer and referenced glazing publications, to comply with system performance requirements.

3.EXECUTION

1. EXAMINATION

A. Examine framing for security glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Minimum required bite.
5. Effective sealing between joints of framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

2. PREPARATION

A. Clean glazing channels and other framing members receiving security glazing immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3. GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of security glazing, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect edges of security glazing from damage during handling and installation. Remove damaged security glazing from Project site and legally dispose of off Project site. Damaged security glazing includes units with edge or face damage or other imperfections that, when installed, could weaken security glazing and impair performance and appearance.

1. Inspect glazing prior to installation; remove damaged glazing.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glazing unit manufacturer. Position setting blocks on lower edge at quarter points and support full glass thickness. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by security glazing manufacturers for installing lites.

F. Provide spacers for security glazing lites where the length plus width is larger than 50 inches (1270 mm).

1. Locate spacers directly opposite each other on both inside and outside faces of security glazing. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with performance requirements.
2. Provide 1/8-inch (3-mm) minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
3. When using cushioning material, provide 1/8-inch (3-mm) minimum face clearance.
4. For polycarbonate expansion, provide 1/4-inch (6-mm) minimum edge clearance or 1/16-inch-per-ft. (5.2-mm-per-m) edge clearance of glass length, whichever is larger.
5. Avoid excessive clamping pressures to reduce in-service breakage, particularly with thin annealed glass.

G. Provide edge blocking where indicated or needed to prevent security glazing from moving sideways in glazing channel, as recommended in writing by security glazing manufacturer and in accordance with requirements in referenced glazing publications.

1. For forced-entry glass, provide 1-inch (25.4-mm) minimum edge engagement unless tested successfully to smaller edge engagement. Clearances and setting block allowances are in addition to engagement.

H. Set security glazing in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set coated security glazing with proper orientation so that coatings and films face exterior or interior as specified.

1. Install labeled impact-threat-surface glazing face oriented towards indicated threat direction.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

4. SEALANT GLAZING (WET)

A. Sealants and Caulking: Verify compatibility of sealant with sealant and security glazing manufacturers.

B. Install continuous spacers, or spacers combined with cylindrical sealant backing, between security glazing and glazing stops to maintain face clearances and to prevent sealant from extruding into glazing channel and blocking weep systems. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

C. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to security glazing and channel surfaces.

D. Tool exposed surfaces of sealants to provide a substantial wash away from security glazing.

5. CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect security glazing from contact with contaminating substances resulting from construction operations, including weld splatter. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with security glazing, remove substances immediately as recommended in writing by security glazing manufacturer. Remove and replace security glazing that cannot be cleaned without damage.

C. Wash security glazing on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash security glazing as recommended in writing by security glazing manufacturer.

1. Protect edges of laminated glass from exposure to organic solvents, acids, or cleaners containing ammonia, which react with plastic components.
2. Protect installed glazing from operations of construction trades.
3. Pay particular care during initial cleaning, especially for severely soiled surfaces.
4. Do not attempt to remove dry deposits.
5. Do not use sharp blades or scrapers to remove deposits or clean glass.
6. Preinspection Cleaning:

    a. Initially flush glazing with water to soften and remove as many contaminants as possible.
    b. Use clean squeegee to remove excess water, ensuring abrasive deposits are not trapped between squeegee and glazing surface.
    c. Use a mild nonabrasive, nonalkaline cleaner and a soft, grit-free cloth to clean glazing.
    d. Rinse immediately with water, removing excess water with a squeegee.

7. Routine Cleaning:

    a. Use a mild soap or detergent, with lukewarm water, and a clean, grit-free cloth.
    b. Dry surface immediately.

8. Cleaning Exposed Polycarbonate:

    a. Exposed polycarbonate has mar-resistant coatings.
    b. Take extra care to avoid scratching or other damage.
    c. Do not use abrasive cleaners or solvents.
    d. Wash with mild detergent and lukewarm water, using clean, grit-free cloths.
    e. Rinse immediately with clean water and dry with a chamois or moist cellulose sponge to avoid water spots.
    f. Remove fresh paint, grease, and smeared glazing compounds using isopropyl alcohol. Wash with warm water and a mild detergent.

6. GLASS-CLAD POLYCARBONATE SECURITY GLAZING SCHEDULE

A. Forced-Entry Security Glazing Type SG-FE2: Clear glass-clad polycarbonate (GCP).

1. Basis-of-Design Product: Subject to compliance with requirements, provide Oldcastle BuildingEnvelope, a CRH Company; ArmorProtect Plus 121100 lites or comparable product by one of the following:
   a. Global Security Glazing.
   b. Approved equal alternate manufacturer

2. Forced-Entry Resistance: Grade 4 in accordance with ASTM F1915.
3. Forced-Entry Resistance: Level 1 in accordance with HPW-TP-0500.02.
4. Ballistic Resistance: Level A, 0.38 Special in accordance with HPW-TP-0500.02.
5. Nominal Overall Unit Thickness: 1.31”.
6. Outer Ply: 1/8”-thick, clear heat-strengthened glass.
7. .050” Urethane coating (possibly white urethane, see below)
8. Single Core: 0.25” thick polycarbonate.
9. .050” Urethane coating
10. Inner Ply: 1/8”-thick, clear heat-strengthened glass
11. 1/2” Air space
12. Interlayer Material: .25” Vitro solar ban 60VT on clear (#2 surface).
13. Some of the glazed openings have a privacy obscurity film. Provide an obscurity film in the same locations as existing. If the Urethane layer noted above can be white where required and clear where not, that is the desired solution. Provide an alternate highly durable solution if this options is not possible.

END OF SECTION 088853