SECTION 08 34 01

FORCED ENTRY RESISTANT COMPONENTS

04/17

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL (AMCA)

AMCA 500-D	(2012) Laboratory Methods of Testing Dampers for Rating

ALUMINUM ASSOCIATION (AA)

AA DAF45	(2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2015; Errata 1 2015; Errata 2 2016) Structural Welding Code - Steel

ASM INTERNATIONAL (ASM)

ASM STFA	(2001; 6th Ed) The Surface Treatment and Finishing of Aluminum and Its Alloys (2 Vol.)

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A653/A653M	(2015; E 2016) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C1036	(2016) Standard Specification for Flat Glass
ASTM C1048	(2012; E 2012) Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
ASTM C1172	(2014) Standard Specification for Laminated Architectural Flat Glass
ASTM D1003	(2013) Haze and Luminous Transmittance of Transparent Plastics

ASTM D1044	(2013) Resistance of Transparent Plastics to Surface Abrasion
ASTM D1922	(2015) Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method
ASTM D256	(2010) Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D3595	(2014) Polychlorotrifluoroethylene (PCTFE) Extruded Plastic Sheet and Film
ASTM D3951	(2015) Commercial Packaging
ASTM D4093	(1995; R 2014) Photoelastic Measurements of Birefringence and Residual Strains in Transparent or Translucent Plastic Materials
ASTM D4802	(2016) Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet
ASTM D542	(2014) Index of Refraction of Transparent Organic Plastics
ASTM D5420	(2016) Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Strike Impacted by a Falling Weight (Gardner Impact)
ASTM D570	(1998; E 2010; R 2010) Standard Test Method for Water Absorption of Plastics
ASTM D635	(2014) Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D638	(2014) Standard Test Method for Tensile Properties of Plastics
ASTM D696	(2016) Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer
ASTM D792	(2013) Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D882	(2012) Tensile Properties of Thin Plastic Sheeting
ASTM D905	(2008; E 2009) Strength Properties of Adhesive Bonds in Shear by Compression

	Loading
ASTM E1300	(2016) Standard Practice for Determining Load Resistance of Glass in Buildings
ASTM E169	(2016) Standard Practices for General Techniques of Ultraviolet-Visible Quantitative Analysis
ASTM E831	(2014) Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
ASTM E90	(2009) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
ASTM F1233	(2008; R 2013) Security Glazing Materials and Systems
ASTM F428	(2009; R 2014) Intensity of Scratches on Aerospace Glass Enclosures
ASTM F520	(2016) Standard Test Method for Environmental Resistance of Aerospace Transparencies to Artificially Induced Exposures
ASTM F521	(2016) Standard Test Methods for Bond Integrity of Transparent Laminates
ASTM F548	(2009; R 2014ntensity of Scratches on Aerospace Transparent Plastics
ASTM F735	(2011) Abrasion Resistance of Transparent Plastics and Coatings Using the Oscillating Sand Method
ASTM F791	(1996; R 2013) Stress Crazing of Transparent Plastics
ASTM G155	(2013) Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.1	(2013) Butts and Hinges
ANSI/BHMA A156.115	(2016) Hardware Preparation in Steel Doors and Steel Frames
ANSI/BHMA A156.13	(2012) Mortise Locks & Latches Series 1000
ANSI/BHMA A156.16	(2013) Auxiliary Hardware
ANSI/BHMA A156.18	(2016) Materials and Finishes
ANSI/BHMA A156.4	(2013) Door Controls - Closers

ANSI/BHMA A156.5	(2014) Cylinder and Input Devices for Locks
ANSI/BHMA A156.8	(2015) Door Controls - Overhead Stops and Holders

GLASS ASSOCIATION OF NORTH AMERICA (GANA)

GANA Glazing Manual	(2009) Glazing Manual

H.P. WHITE LABORATORY (HPW)

HPW TP-0500.03	(2003) Transparent Materials for use in Forced Entry or Containment Barriers

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM HMMA 801	(2012) Glossary of Terms for Hollow Metal Doors and Frames
NAAMM HMMA 802	(2007) Manufacturing of Hollow Metal Doors and Frames
NAAMM HMMA 810	(2009) Hollow Metal Doors
NAAMM HMMA 820	(2008) Hollow Metal Frames
NAAMM HMMA 830	(2002) Hardware Selection for Hollow Metal Doors and Frames

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(2016) Standard for Fire Doors and Other Opening Protectives
NFPA 80A	(2017) Recommended Practice for Protection of Buildings from Exterior Fire Exposures

U.S. DEPARTMENT OF STATE (SD)

SD Std-01.01	(1993 Rev G Amended; Inx Certified Prod/Mfg) Certification Standard Forced Entry and Ballistic Resistance of Structural Systems

UNDERWRITERS LABORATORIES (UL)

UL 10B	(2008; Reprint Feb 2015) Fire Tests of Door Assemblies

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval.Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation; G

SD-03 Product Data

Forced Entry Resistant Components
Installation
Components

SD-07 Certificates

Forced Entry Resistant Components; G

1.3 QUALITY ASSURANCE

Qualify welding procedures, welders, and welding operators in accordance with AWS D1.1/D1.1M. Forced entry resistant components shall be certified as resistant to one or more of the forced entry test standards indicated below. Forced entry resistant components shall be tested based on the level of threat; threat levels and testing requirements will be determined on a per project basis, and indicated in the contract documents. The test results and certification thereof shall be approved by the Contracting Officer before delivery of the component to the job site.

Test Standard	Level Within Test Standard (If Any)	Minimum Attack Time (Minutes)
ASTM F1233	Class IV	Variable
ASTM F1233	Class V	Variable
HPW TP-0500.03	Prolonged	180
HPW TP-0500.03	Level II	Variable
HPW TP-0500.03	Level III	Variable
HPW TP-0500.03	Level IV	Variable
HPW TP-0500.03	Level V	Variable
SD Std-01.01	5 Minute	5
SD Std-01.01	15 Minute	15
SD Std-01.01	60 Minute	60

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver Components to the job site with the manufacturer's name, and model number clearly marked thereon. Components shall be delivered, stored, and handled so as not to be damaged or deformed and shall be in accordance with ASTM D3951. Components shall be handled carefully to prevent damage to the faces, edges, corners, ends, and glazing where applicable. Abraded, scarred, or rusty areas shall be cleaned, repaired, or replaced immediately upon detection of the damage. Replace damaged components that cannot be restored. Components and equipment shall be stored in a dry location on platforms or pallets that are ventilated adequately, free of dust, water, and other contaminants, and stored in a manner which permits easy access for inspection and handling. Submit lists including schedule

of components to be incorporated in the work with manufacturer's model or catalog numbers, specification and drawing reference numbers, warranty information, threat level designated, fire ratings, sound transmission coefficient ratings, insulation "U" value, and number of items provided. Listing of similar products that have been satisfactorily in use for two years or more, including name of purchasers, locations of installations, dates of installations, and service organizations.

1.5 SEQUENCING AND SCHEDULING

When testing of a previously untested component is specified, allow sufficient lead time so that testing will not delay construction. The test results and component shall be approved by the Contracting Officer before delivery of the component to the job site.

1.6 WARRANTY

Manufacturer's warranty for 5 years shall be furnished for glazing materials. Warranty shall provide for replacement and installation of glazing if delamination, discoloration, or cracking or crazing occurs.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

2.1.1 General Requirements

Components covered in this specification are designed to resist forced entry attacks with increasing severity levels of hand, power, and thermal tools and weapons and explosives. The components may include forced entry resistant personnel door/frame assemblies louvers windows glazing for doors and pass-through drawers. Each type of forced entry resistant component shall be a complete assembly produced by a single manufacturer. Movable and operable components shall operate smoothly and freely. Items for exterior installation shall be designed to resist water and vapor penetration or entrapment. Submit manufacturer's descriptive data, installation instructions, and certificate and test report showing compliance with the specified forced entry test standard as specified in paragraph COMPONENT TEST REQUIREMENTS for all components. Following approval of manufacturer's descriptive data, submit a schedule listing the items and components to be furnished. Manufacturer's certificate shall be submitted indicating that compliance with the installation instructions and drawings will provide the specified degree of forced entry resistance.

2.1.2 Other Submittal Requirements

The following shall be submitted:

a. Manufacturer's descriptive data and finish samples.

b. The forced entry resistant door lock functions, for selection by the Contracting Officer.

c. Airflow calculations for louvers.

d. Manufacturer's certificates attesting that components conform to the requirements on drawings and in specifications.

e. Testing reports from independent testing laboratories indicating

conformance to regulatory requirements.

f. Certificate, in lieu of a label, for fire rated doors.

g. Certificate indicating compliance with the requirements for doors of the type and fire rating class.

h. Manufacturer certification that compliance with the installation instructions and/or drawings will provide the specified degree of forced entry resistance.

2.2 COMPONENTS

Each type of forced entry resistant component shall be the standard product of a manufacturer regularly engaged in the manufacture of such products and shall duplicate items that have been tested and approved in accordance with the forced entry test standard specified in paragraph COMPONENT TEST REQUIREMENTS.

2.3 FORCED ENTRY RESISTANT PERSONNEL DOOR AND FRAME ASSEMBLIES

Doors and frames shall be factory fabricated assemblies of indicated sizes. Doors shall be of steel, hardened steel, or be reinforced internally with steel shapes and clad with aluminum. Interior composition and reinforcement shall be determined by the manufacturer. Rubber silencers shall be installed on door frames. Exterior doors shall have top edges closed flush and sealed against water penetration, be insulated, and provided with weatherstripping and thresholds. Locks and hinges shall be the same or equal in performance and number as the hardware used on the tested door. Lock and hardware shall be provided by the manufacturer as a complete assembly. Frames shall be furnished by the door fabricator, with anchorage to wall construction completely specified as to number of anchors, anchor size, material, and length.

2.3.1 Fire Rated Doors

Provide fire rated doors at locations indicated. Door assemblies shall comply with the forced entry test standard specified and shall bear the listing identification label of the Underwriters' Laboratories, Inc. or a nationally recognized testing laboratory that is qualified to perform tests of fire door assemblies in accordance with UL 10B, and that has a listing service for the tested assemblies. Door assemblies include door, hardware, frame, closers, and glazing. A certificate indicating that the units were inspected in accordance with NFPA 80 and NFPA 80Amay be furnished in lieu of label. For oversized doors, a certificate from Underwriters' Laboratories, Inc. or a nationally recognized testing laboratory may be furnished in lieu of label. The certificate shall state that oversized doors are manufactured in compliance with the requirements for doors of the type and fire rating class. Manufacturer's descriptive data shall be submitted.

2.3.2 Sound Rated Doors

Provide sound rated doors at locations indicated. Door assemblies shall comply with the forced entry test standard specified and shall consist of door, hardware, frame, threshold, and adjustable gaskets. The assembly shall have a laboratory Sound Transmission Class (STC) rating as indicated when tested in accordance with ASTM E90. Submit manufacturer's descriptive data, test report, and certification of the test report

showing compliance with the specified requirements.

2.3.3 Door and Frame Fabrication

The subsurfaces shall be flat, parallel, and plumb after fabrication. Doors shall be reinforced in accordance with manufacturer's design. Door frames shall be anchored as specified by the door manufacturer. Coordinate the door manufacturer's requirements for welding to wall reinforcement or casting frame embedments into wall before wall is placed. Steel door frames shall be mitered or coped and welded at the corners with welds ground smooth. Where structural channel frames are used the size, weight, stops, welding, and anchorage into surrounding construction shall be specified and tested along with the door as an assembly. Any necessary reinforcements in the door and the frame shall be made in the factory. Door and frame shall be drilled and tapped as required for the specified hardware. Frame channels shall be mitered or coped and welded at corners with full penetration groove welds. Exposed welds shall be dressed smooth. Hollow metal doors and frames shall be manufactured in accordance with NAAMM HMMA 801, NAAMM HMMA 802, NAAMM HMMA 810, and NAAMM HMMA 820 as a standard of quality, and shall meet the specified forced entry testing standard.

2.3.4 Sidelight Frames and Door Glazing

Construct sidelight frames using forced entry resistant door frame sections. For glazing in door or sidelight, stop height and rabbet depth shall be as required to accommodate the glazing material that is resistant to the forced entry test standard specified. The assembly shall be tested with the specified glazing and stops installed. Exterior (attack side) glazing stops shall be welded or integral to the frame. Interior (protected side) glazing stops shall be removable stops attached with high-strength alloy steel machine screws with tamper-resistant heads or as required by the manufacturer. Glazing is specified in paragraph Forced Entry Resistant Glazing Materials.

2.3.5 Preparation for Hardware

Prepare doors and frames for hardware in accordance with manufacturer's instructions. Surface applied hardware shall be drilled and tapped in the field.

2.3.6 Hardware

Hardware for forced entry resistant door assemblies shall be provided by the door assembly manufacturer to ensure a complete forced entry resistant assembly. Where test standard requires hardware to be tested with the door assembly, locks and hinges shall be included in the labeling and/or test certification. Locks and hinges shall be the same or equal in performance, quality, grade, and quantity as used on the successfully tested door assembly in accordance with the specified forced entry testing standard. Provide certification that the locks, latches, and hinges provide the same degree of forced entry resistance as required by the specified forced entry testing standard. Keying shall be as specified in Section 08 71 00 DOOR HARDWARE.

2.3.6.1 Locks and Latchsets

The door manufacturer shall submit available lock functions for selection of function by the Contracting Officer. Mortise lock and latchsets shall

be, as a minimum, series 1000, operational Grade 1, Security Grade 1 or 1A, and shall conform to ANSI/BHMA A156.13. Strikes for mortise locks and latches (including deadbolt locks), as a minimum, shall conform to ANSI/BHMA A156.115 except strikes shall be rectangular (without curved lip). Mortise-type locks and latches for doors 1-3/4 inches thick and over shall have adjustable bevel fronts or otherwise conform to the shape of the door. Mortise locks shall have armored fronts. Mortise locks and latches shall have full escutcheon, through-bolted, extruded stainless steel trim. Lock finish shall be 630in accordance with ANSI/BHMA A156.18.

2.3.6.2 Hinges

Steel doors and frames required to resist the "very low" or "low" threat severity level that are up to and including 7 feet 0 inches high shall, as a minimum, be equipped with three Grade 1 hinges in accordance with ANSI/BHMA A156.1, minimum size 5 inches high, heavy, double, or triple weight as required for weight of door. For each additional 12 inches of door height beyond 7 feet 0 inches, provide a minimum of one more hinge. Hinges shall be full mortise, half mortise, full surface, or half surface design as recommended by the manufacturer for frame and door design and shall be tamperproof unless mounted on the protected side of the door. Hinges shall have nonremovable pinsand be equipped with a safety stud. Spot welding of hinge pin will not be acceptable. Provide hinge manufacturer's certification that the hinge supplied meets applicable test requirements for ANSI/BHMA A156.1 type number of hinge specified and that the hinge is suitable for the size and weight of the door assembly on which it will be utilized. Continuous extra heavy-duty piano-type hinge sized to carry the weight of the door without sagging is permitted. If continuous piano-type hinges are provided with the door, independent laboratory reports covering both the door weight capacity and a 2,500,000 cycle testing to match the ANSI/BHMA A156.1 Grade 1 requirements shall be furnished by the Contractor. Interior door hinges shall be furnished in prime coated steel. Exterior door hinges shall be furnished in nonferrous metal or stainless steel.

2.3.6.3 Electric Strikes

Where required, provide electric strikes conforming to ANSI/BHMA A156.5 Grade 1. Furnish strike boxes with deadbolt and latch strikes for Grade 1. Strikes shall be fail secure.

2.3.6.4 Door Closers

Closers shall be extra heavy duty of size and type recommended by the manufacturer and shall be Grade 1 conforming to ANSI/BHMA A156.4. Door closer finish shall be 689 in accordance with ANSI/BHMA A156.18.

2.3.6.5 Door Stops

Door stops shall be extra heavy duty, conforming to ANSI/BHMA A156.8, Type C08511 for overhead surface mounted type,ANSI/BHMA A156.16, Type L11251 for floor mounted installationorANSI/BHMA A156.16, Type L11271 for wall mounted installation.

2.3.7 Frame Anchors

Provide jamb and head anchors with door/frame assembly as specified by the manufacturer and forced entry resistant to the same degree as the component. Coordinate concrete work with component manufacturers when the

manufacturer specifies frame anchors to be embedded into a concrete or concrete masonry unit surface during construction.

2.3.8 Weatherstripping

Provide head and jambs of exterior doors with compression-type neoprene bulb or closed-cell neoprene adjustable type weatherstripping. Door stops shall be weatherstripped with a surface-mounted sponge neoprene strip in bronze housing not less than 0.070 inch thick installed to make contact with the door. Install weatherstripping in conformance with the manufacturer's directions after completion of finish painting.

2.3.9 Louvers for Doors

Where indicated, provide doors with full louvers or louver section. Louvers shall be sightproof type inserted into the door. Pierced louvers shall not be used. Inserted louvers shall be stationary and shall be nonremovable from the attack side of forced entry resistant doors. The free area of the total square feet of the louver shall be 39 percent for chevron style louvers . Louvers shall be in accordance with AMCA 500-D airflow test; minimum airflow shall be 35 percent for chevron style. Submit airflow calculations and test data showing compliance.

2.4 FORCED ENTRY RESISTANT LOUVERS

Fabricate louvers and frames from steel shapes to the opening dimensions indicated. The free area of the total square feet of the louver shall be 39 percent for chevron style louvers . Louver submitted shall have been tested in accordance with AMCA 500-D airflow test; minimum airflow shall be 35 percent for chevron style. Submit airflow calculations and test data showing compliance.

2.5 FORCED ENTRY RESISTANT WINDOW ASSEMBLIES

Forced entry resistant window assemblies shall be constructed using forced entry resistant frame sections. Frames shall be welded units of sizes and shapes indicated with minimum frame face dimensions of 2 inches. Frame anchorage shall be as specified by the manufacturer and forced entry resistant to the same degree as the component. Top height and rabbet depth shall be as required to accommodate the glazing material resistant to the forced entry test standard specified. Exterior (attack side) glazing stops shall be welded to or integral to the frame. Interior (protected side) glazing stops shall be removable stops attached with high-strength alloy steel machine screws with tamper-resistant heads, or as required by the manufacturer.

2.5.1 Deal Trays

Deal tray shall provide nominal 12-3/4 inch wide by 1-5/8 inch high opening in sill of window frame and shall include a 6-1/2 inch steel writing ledge on exterior side of window. Deal tray shall be of the same materials and finish, shall be a welded subassembly of the window assembly, and shall conform to specified forced entry requirements for the entire window assembly.

2.5.2 Speaking Apertures

Fabricate speaking apertures to allow passage of voice at normal speaking volume without distortion, and to resist the referenced forced entry

resistant standard for indoor use. Speaking aperture shall be a welded subassembly of the window assembly and shall conform to the specified requirements for the entire window assembly.

2.5.3 Forced Entry Resistant Glazing Material

Glazing material shall be glass, plastic, or composite and shall conform to applicable requirements ASTM C1036, ASTM E1300, and ASTM C1048. Glazing materials shall be tested in accordance with the applicable sections of the following test procedures: ASTM D905, ASTM D1003, ASTM F428, ASTM F548, ASTM D4093, and ASTM F520. Plastic glazing shall be acrylic plastic sheets, polycarbonate plastic sheets, or approved equal. Plastic glazing shall be smooth and clear on both sides. Glazing material shall be factory installed. Factory-glazed components shall be covered to protect them from damage during adjacent finish work.

2.5.3.1 Laminated Glass

Laminated glass shall be all glass laminated construction conforming to applicable sections of ASTM C1172. The adhesive interlayer material for bonding glass to glass shall be chemically compatible with surfaces which are to be bonded. Materials selected for lamination purposes shall be tested in accordance with the following testing procedures: ASTM D905, ASTM D1044, ASTM F735, ASTM D4093, ASTM F521, ASTM F520, and ASTM D1003. Glass plies used in the lamination shall be annealed float glass conforming to Type I, quality q3, Class 1, ASTM C1036 or heat-strengthened or fully heat-tempered float glass, Condition A, Type I, quality q3, Class 1, ASTM C1048.

2.5.3.2 Acrylic Plastic Sheets

Acrylic plastic glazing sheets shall be for use "as cast" and in stretching operations with improved moisture absorption resistance conforming to ASTM D4802. Acrylic materials shall be tested in accordance with the applicable sections of the following testing procedures: ASTM D256, ASTM D5420, ASTM D542, ASTM D570, ASTM D635, ASTM D638, ASTM D696, ASTM D792, ASTM D1003, ASTM E831, ASTM F791, and ASTM G155.

2.5.3.3 Polycarbonate Plastic Sheets

Polycarbonate plastic sheet shall be laminated or solid, ultraviolet stabilized flame resistant high abrasion resistant sheets shall conform to ASTM D3595. Polycarbonate materials shall be tested in accordance with the applicable sections of the following testing procedures: ASTM D256, ASTM D5420, ASTM D792, ASTM F735, ASTM D1003, ASTM D635, ASTM D638, ASTM D1044, ASTM D882, ASTM D1922, ASTM D570, ASTM F520, ASTM E169, ASTM G155, and ASTM F791. Polyvinyl butyral shall not be used in contact with polycarbonate because its placticizer may craze polycarbonate.

2.5.3.4 Glass/Plastic Laminate Glazing

Glass/plastic laminated glazing materials shall be glass/plastic laminated construction or glass-clad plastic "sandwich" construction conforming to applicable sections of ASTM C1172.

2.5.3.5 Glass/Plastic Air-Gap Glazing

Forced entry resistant glass/plastic air-gap glazing shall consist of an assembly in which glass forms the exterior and interior (protected side)

layer, separated by an air space from the laminated plastic plies. Glass plies shall be annealed float glass conforming to Type I, quality q3, Class 1, ASTM C1036 or heat-strengthened or fully heat-tempered float glass, Condition A, Type I, quality q3, Class 1, ASTM C1048. Plastic plies shall consist of laminated ultraviolet stabilized polycarbonate sheets, conforming to paragraph Polycarbonate Plastic Sheets and/or acrylic sheets for use "as cast" and in stretching operations with improved moisture absorption resistance conforming to paragraph Acrylic Plastic Sheets.

2.5.4 Adhesive Interlayer Materials

Adhesive interlayer material for bonding laminates (glass-glass, glass-plastic, or plastic-plastic bonds) shall be chemically compatible with the surfaces bonded. Interlayer materials may be polyvinyl butyral, cast-in-place urethane, proprietary materials, sheet from urethane and other materials. Polyvinyl butyral shall not be used to bond polycarbonate. Adhesives shall conform to ASTM D905 and the manufacturer's recommendations.

2.5.5 Sealants

Sealants for glazings shall be chemically compatible with the glazing materials they are in contact with and shall have no deleterious effects to the glazing materials or to the adhesives used in glazing laminates. Sealants shall conform to the glazing manufacturer's recommendations and the requirements of GANA Glazing Manual.

2.6 FORCED ENTRY RESISTANT PASS-THROUGH DRAWER

Fabricate pass-through drawer of steel and of the size indicated. Assembly shall provide a weather resistant opening. Attachment to wall assembly shall be in accordance with the manufacturer's recommendations. Finish shall be satin stainless steel.

2.7 ACCESSORIES

Provide accessories for the installation of components into the surrounding structure. Anchorage shall be forced entry resistant to the same degree as the component. Installation shall be in accordance with the manufacturer's recommended instructions. Materials, parts, bolts, anchors, supports, braces, fasteners, and connections necessary for completion of the work.

2.8 LABELING

Forced entry resistant components shall be plainly and permanently labeled as to the applicable forced entry test standard and level within the test standard under which the component was tested and approved. Label shall be visible only from the protected side after component installation and shall include the following information: (1) manufacturer's name or identifying symbol; (2) model number, control number, or equivalent; (3) date of manufacture with the week, month or quarter, and year (this may be abbreviated or be in a traceable code such as the lot number); (4) correct mounting position (by removable label); and (5) forced entry resistant rating by indicating the test standard, level within the test standard (if any), and minutes of attack time withstood (if variable in the standard).

2.9 SHOP/FACTORY FINISHING

Unless otherwise specified, all factory or manufactured components shall be shop finished as indicated below.

2.9.1 Ferrous Metal

Surfaces of ferrous metal, except galvanized and stainless steel surfaces, shall be cleaned and factory primed for painting. Finish painting shall be in accordance with Section 09 90 00 PAINTS AND COATINGS. Prior to shop painting, clean surfaces with solvents to remove grease and oil and with power wire-brushing or sandblasting to remove loose rust, loose mill scale, and other foreign substances. Surfaces of items to be embedded in concrete shall not be shop painted.

2.9.2 Galvanizing

Items specified to be galvanized shall be hot-dip processed after fabrication. Galvanizing shall be in accordance with ASTM A123/A123M or ASTM A653/A653M.

2.9.3 Aluminum

Unless otherwise specified, aluminum items shall be standard mill finish. When anodic coatings are specified, coatings shall conform to ASM STFA, with treatment to a coating thickness not less than that specified for protective and decorative type finish in AA DAF45. Items to be anodized shall receive a polished satin finish pretreatment and a clear lacquer overcoat conforming to the above-referenced standard.

PART 3 EXECUTION

3.1 EXAMINATION

Field verify dimensions of rough openings for components and that surfaces of openings are level, plumb, and provide required clearances. Components shall be examined for racking, twisting, and other malformation and corrected prior to installation. Replace damaged components that cannot be corrected. Protect surrounding work prior to installation of forced entry resistant components. Surrounding work, which is damaged as a result of the installation of forced entry resistant components, shall be repaired in an approved manner prior to acceptance. Protect glazed units from damage during adjacent work.

3.2 FABRICATION

Components shall be constructed, assembled, welded, and equipped with all hardware and accessories required to complete the assembly in the shop of a competent fabricator.

3.3 FASTENERS

Fasteners exposed to view shall match in color and finish and shall harmonize with the material to which fasteners are applied. Holes for bolts and screws shall be drilled or neatly punched. Poor matching of holes shall be cause for rejection of the work. Fasteners shall be concealed where practicable. Unless otherwise specified, fasteners shall conform to Section 05 50 13 MISCELLANEOUS METAL FABRICATIONS.

3.4 CORROSION PROTECTION - DISSIMILAR MATERIALS

Contact surfaces between dissimilar metals and aluminum surfaces in contact with concrete, masonry, pressure-treated wood, or absorptive materials subject to wetting shall be given a protective coating in accordance with Section 09 90 00 PAINTS AND COATINGS.

3.5 INSTALLATION

The finished work shall be free from defects. Install components plumb and level and secure rigidly in place. Install components in accordance with approved manufacturer's recommended instructions. Test operable parts of components for smooth operation in the presence of the Contracting Officer. Coordinate frame embedments into the construction where required by the component manufacturer. Replace or repair materials which incur damage as a result of adjacent finish work as specified above. Window assemblies, which are not specified as factory glazed, shall have glazing installed in accordance with GANA Glazing Manual and the manufacturer's recommended instructions. Field glazing shall occur only after concrete, masonry, ceiling, electrical, mechanical, plumbing and adjacent finish work has been completed. Properly install forced entry resistant door assemblies so that operating clearances and bearing surfaces conform to the manufacturer's instructions. Secure the bottom of door frames to the floor slab in accordance with the manufacturer's recommendations. Weatherstripping and thresholds shall be installed at exterior door openings to provide a weathertight installation. Submit Drawings showing (1) anchorage of components and appurtenances into the actual surrounding construction, (2) clearances for operation, and (3) hardware location and installation details. Submit complete drawings for forced entry resistant prefabricated guardhouses. Submit a copy of installation instructions and recommended cleaning and maintenance instructions.

3.6 MANUFACTURER'S FIELD SERVICES

The manufacturer shall provide the services of a manufacturer's representative who is experienced in the installation, adjustment, and operation of the component specified. At the request of the Contracting Officer, the representative shall supervise the installation, adjustment, and operation (if operable) of the component.

3.7 ADJUSTING/CLEANING

Make adjustments to assure smooth operation. Units shall be weathertight when closed and locked. Clean components in accordance with manufacturer's instructions. Use only cleanser recommended by the manufacturer to clean polycarbonate, plastic, and applied hardcoats.

-- End of Section --