SECTION 083463 - DETENTION DOORS AND FRAMES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Swinging detention doors.

Sliding detention doors.

Detention panels.

Detention frames.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. Minimum-Thickness Steel: Indicated as the specified minimum thicknesses for base metal without coatings, according to NAAMM-HMMA 803.
        2. Nominal-Thickness Stainless Steel: Indicated as the specified thicknesses for which over- and under-thickness tolerances apply, according to ASTM A480.
      1. COORDINATION

Retain "Detention Specialist" paragraph below if retaining Detention Specialist for Project. If Detention Specialist is retained, some of requirements of this Section are responsibility of Detention Specialist rather than Contractor.

* + - * 1. Detention Specialist: Coordinate with Director’s Representative for requirements of this Section that are to be performed by a Detention Specialist or other entity.
        2. Coordinate installation of anchorages for detention frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.
      1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Include construction details, material descriptions, core descriptions, label compliance, [**fire-resistance rating,**] [**temperature-rise ratings,**] and finishes for each detention door and frame type specified.

* + - * 1. Sustainable Design Submittals:
        2. Shop Drawings: In addition to requirements below, provide a schedule using same reference numbers for details and openings as those on Drawings:

Elevations of each door type.

Direction of [**swing**] [**slide**].

Inmate and non-inmate sides.

Details of doors, including vertical and horizontal edge details, and metal thicknesses.

Details of frames, including dimensioned profiles, and metal thicknesses.

Locations of reinforcement and preparations for hardware.

Details of each different wall opening condition.

Details of anchorages, joints, field splices, and connections.

Details of [**food-pass openings**] [**louvers**] [**speaking apertures**] [**and**] [**gun ports**].

Details of moldings, removable stops, and glazing.

Details of conduits, junction boxes, and preparations for [**electrically operated**] [**and**] [**pneumatic**] door hardware.

* + - * 1. Samples for Verification:

For each type of exposed finish required, prepare Samples not less than 3 by 5 inches.

Retain subparagraph below if required.

For "Detention Doors" and "Detention Frames" subparagraphs below, prepare Samples approximately [**12 by 12 inches**] <**Insert dimension**> to demonstrate compliance with requirements for quality of materials and construction:

Detention Doors: Show vertical-edge, top, and bottom construction; insulation; face stiffeners; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.

Detention Frames: Show profile, welded corner joint, welded hinge reinforcement, grout-cover boxes, floor and wall anchors, and silencers. Include separate section showing fixed steel panels and glazing if applicable.

* + - * 1. Qualification Data: For Installer.

Retain "Welding certificates" paragraph below if retaining "Welding Qualifications" paragraph in "Quality Assurance" Article.

* + - * 1. Welding certificates.
        2. Product Test Reports: For each type of detention hollow-metal door and frame assembly including vision and side lights, for tests performed by [**manufacturer and witnessed by a qualified testing agency**] [**a qualified testing agency**].
        3. Examination reports, documenting inspection of substrates, areas, and conditions.
        4. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.
        5. Field quality-control reports, documenting inspections of installed products.

Retain option in subparagraph below if Detention Specialist signs field quality-control certification; coordinate with "Field Quality Control" Article.

Field quality-control certification, signed by Contractor[**and Detention Specialist**].

Retain "Oversize Construction Certification" paragraph below if required.

* + - * 1. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.
      1. MAINTENANCE MATERIAL SUBMITTALS
         1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.

Tools: Provide [**two**] <**Insert number**> sets of tools for installing and removing security fasteners.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

Retain "Welding Qualifications" paragraph below if shop or field welding is required. If retaining, also retain "Welding certificates" paragraph in "Informational Submittals" Article.

* + - * 1. Welding Qualifications: Qualify procedures and personnel according to the following:

AWS D1.1, "Structural Welding Code - Steel."

AWS D1.3, "Structural Welding Code - Sheet Steel."

AWS D1.6, "Structural Welding Code - Stainless Steel."

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver detention hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
         2. Deliver detention frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
         3. Store detention hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. MANUFACTURERS
         1. Source Limitations: Obtain detention doors and frames from single source from single manufacturer.
      2. REGULATORY REQUIREMENTS

Revise "Fire-Rated Assemblies" paragraph below to allow neutral pressure testing if required and as acceptable to authorities having jurisdiction. Retain option if temperature-rise assemblies are required.

* + - * 1. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings[**and temperature-rise limits**] indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

Retain "Oversize Fire-Rated Assemblies" subparagraph below if required by authorities having jurisdiction.

Oversize Fire-Rated Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

* + - * 1. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.
      1. DETENTION DOOR AND FRAME ASSEMBLIES
         1. Detention Door and Frame Assemblies: Provide detention door and frame assemblies that comply with the following, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project:

Security Grade: Assemblies pass testing requirements in ASTM F1450 for security grades specified.

Ratings in "Bullet Resistance" and "Tool-Attack Resistance" subparagraphs below are not required by ASTM F1450 unless specified in the Construction Documents; delete if not required. Indicate on Drawings or in a detention door schedule which doors are required to be bullet resistant or tool-attack resistant and the protected and attack sides.

Bullet Resistance: Level 3 rated when tested according to UL 752.

Tool-Attack Resistance: Small-tool-attack-resistance rated when tested according to UL 437 and UL 1034.

* + - * 1. Detention Frames: Provide sidelight and borrowed-light detention frames that comply with ASTM F1592 and removable stop test according to NAAMM-HMMA 863, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
      1. DETENTION DOORS
         1. General: Provide flush-design detention doors of seamless hollow construction, 2 inches thick unless otherwise indicated. Construct detention doors with smooth, flush surfaces without visible joints or seams on exposed faces or stile edges.

For single-acting swinging detention doors, bevel both vertical edges 1/8 inch in 2 inches.

For sliding detention doors, square both vertical edges.

* + - * 1. Core Construction: Provide the following core construction of same material as detention door face sheets, welded to both detention door faces:

Core construction in "Steel-Stiffened Core" subparagraph below is the industry standard. Core construction in "Truss-Stiffened Core" subparagraph is only available from Trussbilt; the Federal Bureau of Prisons accepts it as equivalent to steel-stiffened core, provided doors comply with performance requirements.

Steel-Stiffened Core: 0.042-inch thick, steel vertical stiffeners extending full-door height, with vertical webs spaced not more than 4 inches apart, spot welded to face sheets a maximum of 3 inches o.c. Fill spaces between stiffeners with insulation.

Truss-Stiffened Core: 0.013-inch thick, steel, truncated triangular stiffeners extending between face sheets and for full height and width of door; with stiffeners welded to face sheets not more than 3 inches o.c. vertically and 2-3/4 inches horizontally. Fill spaces between stiffeners with insulation.

* + - * 1. Vertical Edge Channels: 0.123-inch thick, continuous channel of same material as detention door face sheets, extending full-door height at each vertical edge; welded to top and bottom channels to create a fully welded perimeter channel. Noncontiguous channel is permitted to accommodate lock-edge hardware only if lock reinforcement is welded to and made integral with channel.
        2. Top and Bottom Channels: 0.123-inch thick metal channel of same material as detention door face sheets, spot welded, not more than 4 inches o.c., to face sheets.

Reinforce top edge of detention door with 0.053-inch thick closing channel, welded so channel web is flush with top door edges.

* + - * 1. Hardware Reinforcement: Fabricate reinforcing plates from same material as detention door face sheets to comply with the following minimum thicknesses:

Retain reinforcements in subparagraphs below or revise to suit Project.

Full-Mortise Hinges and Pivots: 0.187 inch thick.

Maximum-Security Surface Hinges: 0.250 inch thick.

Strike Reinforcements: 0.187 inch thick.

Slide-Device Hanger Attachments: As recommended by device manufacturer.

Lock Fronts, Concealed Holders, and Surface-Mounted Closers: 0.093 inch thick.

All Other Surface-Mounted Hardware: 0.093 inch thick.

Lock Pockets: 0.123 inch thick at non-inmate side, welded to face sheet.

* + - * 1. Hardware Enclosures: Provide enclosures and junction boxes for electrically operated detention door hardware of same material as detention door face sheets, interconnected with UL-approved, 1/2-inch diameter conduit and connectors.

Retain "Access Plates" subparagraph below if required.

Access Plates: Where indicated for wiring installation, provide access plates to junction boxes, fabricated from same material and thickness as face sheet and fastened with at least four security fasteners spaced not more than 6 inches o.c.

* + - * 1. Interior Detention Doors: Construct interior doors to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.

Metal thicknesses indicated in "Security Grade 1" and "Security Grade 2" subparagraphs below correspond to obsolete 12-gage designation.

Security Grade 1: Provide doors with face sheets of [**0.093-inch minimum-thickness, cold-rolled steel**] [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Security Grade 2: Provide doors with face sheets of [**0.093-inch minimum-thickness, cold-rolled steel**] [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Metal thicknesses indicated in "Security Grade 3" and "Security Grade 4" subparagraphs below correspond to obsolete 14-gage designation.

Security Grade 3: Provide doors with face sheets of [**0.067-inch minimum-thickness, cold-rolled, steel**] [**0.067-inch minimum-thickness, metallic-coated, cold-rolled, steel**] [**0.078-inch nominal-thickness stainless steel**].

Security Grade 4: Provide doors with face sheets of [**0.067-inch minimum-thickness, cold-rolled steel**] [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

* + - * 1. Exterior Detention Doors: Construct exterior doors to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.

Metal thicknesses indicated in "Security Grade 1" and "Security Grade 2" subparagraphs below correspond to obsolete 12-gage designation.

Security Grade 1: Provide doors with face sheets of [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Security Grade 2: Provide doors with face sheets of [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Metal thicknesses indicated in "Security Grade 3" and "Security Grade 4" subparagraphs below correspond to obsolete 14-gage designation.

Security Grade 3: Provide doors with face sheets of [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

Security Grade 4: Provide doors with face sheets of [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

* + - 1. DETENTION FRAMES
         1. General: Provide fully welded detention frames with integral stops, of seamless construction without visible joints or seams. Fabricate detention frames with contact edges closed tight and corners mitered, reinforced, and continuously welded full depth and width of detention frame.

Retain one of two options in "Stop Height" paragraph below. NAAMM-HMMA 863 specifies first option as a default but notes that second option is sometimes used with 2-inch-thick detention doors.

* + - * 1. Stop Height: Provide minimum stop height of [**0.625 inch**] [**0.750 inch**] for detention door openings and minimum stop height of 1-1/4 inches in security glazing or detention panel openings unless otherwise indicated.
        2. Interior Detention Frames: Construct interior frames to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.

Metal thicknesses indicated in "Security Grade 1" and "Security Grade 2" subparagraphs below correspond to obsolete 12-gage designation.

Security Grade 1: Provide frames fabricated from [**0.093-inch minimum-thickness, cold-rolled steel**] [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Security Grade 2: Provide frames fabricated from [**0.093-inch minimum-thickness, cold-rolled steel**] [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Metal thicknesses indicated in "Security Grade 3" and "Security Grade 4" subparagraphs below correspond to obsolete 14-gage designation.

Security Grade 3: Provide frames fabricated from [**0.067-inch minimum-thickness, cold-rolled steel**] [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

Security Grade 4: Provide frames fabricated from [**0.067-inch minimum-thickness, cold-rolled steel**] [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

* + - * 1. Exterior Detention Frames: Construct exterior frames to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.

Metal thicknesses indicated in "Security Grade 1" and "Security Grade 2" subparagraphs below correspond to obsolete 12-gage designation.

Security Grade 1: Provide frames fabricated from [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Security Grade 2: Provide frames fabricated from [**0.093-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.109-inch nominal-thickness stainless steel**].

Metal thicknesses indicated in "Security Grade 3" and "Security Grade 4" subparagraphs below correspond to obsolete 14-gage designation.

Security Grade 3: Provide frames fabricated from [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

Security Grade 4: Provide frames fabricated from [**0.067-inch minimum-thickness, metallic-coated, cold-rolled steel**] [**0.078-inch nominal-thickness stainless steel**].

* + - * 1. Hardware Reinforcement: Fabricate reinforcing plates from same material as detention frame to comply with the following minimum thicknesses:

Retain reinforcements in "Hinges and Pivots" subparagraph below or revise to suit Project.

Hinges and Pivots: 0.187 inch thick by 1-1/2 inches wide by 10 inches long.

Strikes[**, Flush Bolts,**] and Closers: 0.187 inch thick.

Surface-Mounted Hardware: 0.093 inch thick.

Lock Pockets: 0.123 inch thick at non-inmate side, welded to face sheet. Provide 0.123-inch thick, lock protection plate for attachment to lock pocket with security fasteners.

* + - * 1. Hardware Enclosures: Provide enclosures and junction boxes for electrically operated detention door hardware, interconnected with UL-approved, 1/2-inch diameter conduit and connectors.

Retain "Access Plates" subparagraph below if required.

Access Plates: Where indicated for wiring installation, provide access plates to junction boxes, fabricated from same material and thickness as face sheet and fastened with at least four security fasteners spaced not more than 6 inches o.c.

* + - * 1. Mullions and Transom Bars: Provide closed or tubular mullions and transom bars where indicated. Fasten mullions and transom bars at crossings and to jambs by butt welding. Reinforce joints between detention frame members with concealed clip angles or sleeves of same metal and thickness as detention frame.
        2. Jamb Anchors: Weld jamb anchors to detention frames near hinges and directly opposite on strike jamb or as required to secure detention frames to adjacent construction.

Fire ratings may require additional anchors.

Number of Anchors: Provide two anchors per jamb plus the following:

Detention Door Frames: One additional anchor for each 18 inches, or fraction thereof, above 54 inches in height.

Detention Frames with Security Glazing or Detention Panels: One additional anchor for each 18 inches, or fraction thereof, above 36 inches in height.

Retain "Masonry Anchors," "Embedded Anchors," and "Postinstalled Anchors" subparagraphs below if required. See the Evaluations for an explanation of different anchor types.

Masonry Anchors: Adjustable, corrugated or perforated, strap-and-stirrup anchors to suit detention frame size; formed of same material and thickness as detention frame; with strap not less than 2 inches wide by 10 inches long.

Embedded Anchors: Provide detention frames with removable faces at jambs where embedded anchors are indicated. Anchors consist of the following three parts:

Embedded Plates: Steel plates, 0.188 inch thick by 4 inches wide by 6 inches long . Continuously weld two steel bars, 1/2 inch in diameter and 10 inches long with 2-inch 90-degree turndown on ends, to the embedded end of each plate. Weld steel angles, 0.188 inch thick by 2 by 2 by 4 inches long, to the exposed end of each plate. Embed at locations to match frame angles.

Frame Angles: Steel angles, 0.188 inch thick by 2 by 2 by 4 inches long, welded to detention frames with 1-inch long welds at each end of angle.

Connector Angles: Steel angles, of size required, to connect frame angles and embedded plates.

Postinstalled Anchors: Minimum 1/2-inch diameter, concealed bolts with expansion shields or inserts. Provide conduit spacer from detention frame to wall, welded to detention frame. Reinforce detention frames at anchor locations.

* + - * 1. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, formed of same material and thickness as detention frame, and as follows:

Retain "Monolithic Concrete Slabs" or "Separate Topping Concrete Slabs" subparagraph below.

Monolithic Concrete Slabs: Clip anchors, with two holes to receive fasteners, welded to bottom of jambs and mullions with at least four spot welds per anchor.

Separate Topping Concrete Slabs: Adjustable anchors with extension clips, allowing not less than 2-inch height adjustment, welded to jambs and mullions with at least four spot welds per anchor. Terminate bottom of detention frames at finish floor surface.

Delete "Rubber Door Silencers" paragraph below if silencers are furnished as detention door hardware or if silencers are not allowed.

* + - * 1. Rubber Door Silencers: Except on weather-stripped detention doors, drill stops in strike jambs to receive three silencers on single-detention-door frames and drill head jamb stop to receive two silencers on double-detention-door frames. Keep holes clear during construction.
        2. Grout Guards: Provide factory-installed grout guards of same material as detention frame, welded to detention frame at back of hardware cutouts, silencers, and glazing-stop screw preparations to close off interior of openings and prevent mortar or other materials from obstructing hardware operation or installation.
      1. DETENTION PANELS
         1. Provide fixed detention panels of same materials, construction, and finish as specified for adjoining detention door.
      2. MOLDINGS AND STOPS
         1. Provide fixed moldings on inmate side of glazed openings and removable stops on non-inmate side.

Height: As required to provide minimum 1-inch glass engagement, but not less than 1-1/4 inches.

Fixed Moldings: Formed from same material as detention door and frame face sheets, but not less than 0.093 inch thick, and spot welded to face sheets a maximum of 5 inches o.c.

First option in "Removable Stops" subparagraph below is maximum allowed by NAAMM-HMMA 863. Retain second option for higher security. Revise if other spacing is required.

Removable Stops: Formed from 0.123-inch thick angle, of same material as detention door face sheets. Secure with button head security fasteners spaced uniformly not more than [**9 inches**] [**6 inches**] o.c. and not more than 2 inches from each corner, and as necessary to satisfy performance requirements. Form corners with notched or mitered hairline joints.

* + - * 1. Coordinate rabbet width between fixed and removable stops with glass or panel type and installation type indicated.
      1. MATERIALS

Retain materials in "Hot-Rolled Steel Sheet," "Cold-Rolled Steel Sheet," "Metallic-Coated Steel Sheet," and "Stainless-Steel Sheet" paragraphs below or revise to suit Project.

* + - * 1. Hot-Rolled Steel Sheet: ASTM A1011, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
        2. Cold-Rolled Steel Sheet: ASTM A1008, CS (Commercial Steel), Type B.
        3. Metallic-Coated Steel Sheet: ASTM A653, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.

Type 304 stainless steel in "Stainless-Steel Sheet" paragraph below is most commonly used stainless-steel alloy; Type 316 provides greater corrosion resistance. Other alloys are available for specialty applications; verify with manufacturer. If using more than one type on job, indicate locations on Drawings.

* + - * 1. Stainless-Steel Sheet: ASTM A240, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated on Drawings**] <**Insert type**>.
        2. Steel Plates, Shapes, and Bars: ASTM A36.
        3. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.

Coordinate "Masonry Anchors," "Embedded Anchors," and "Post-Installed Anchors" paragraphs below with anchors retained in "Jamb Anchors" paragraph in "Detention Frames" Article.

* + - * 1. Masonry Anchors: Fabricated from same steel sheet as door face.
        2. Embedded Anchors: Fabricated from mild steel shapes and plates, hot-dip galvanized according to ASTM A153.
        3. Post-Installed Anchors: Torque-controlled expansion anchors.

Material in "Material for Interior Locations" subparagraph below protects against corrosion in an indoor atmosphere.

Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

First option in "Material for Exterior Locations and Where Stainless Steel Is Indicated" subparagraph below refers to Type 304 and similar alloys; second option refers to Type 316 and similar alloys.

Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy [**Group 1 (A1)**] [**Group 2 (A4)**] stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

* + - * 1. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
        2. Glazing: Comply with Section 088853 "Security Glazing."

NAAMM-HMMA 863 recommends that the maximum slump for grout be that indicated in "Grout" paragraph below, because thinner grout leaks into grout-protected areas regardless of precautions. See the Evaluations for discussion.

* + - * 1. Grout: Comply with ASTM C476, with a slump of not more than 4 inches as measured according to ASTM C143.
        2. Insulation: Slag-wool-fiber/rock-wool-fiber or glass-fiber blanket insulation. ASTM C665, Type I (unfaced); with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics. Minimum 1.5-lb/cu. ft. density.

Retain "Bituminous Coating" or "Waterborne Asphaltic Emulsion Coating" paragraph below if field application of frame back coating is indicated in Part 3. Bituminous coating is the traditional asphalt mastic bituminous coating. Waterborne asphaltic emulsion coating is a modified coating with zero VOCs and zero hazardous air pollutants (HAPs).

* + - * 1. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
        2. Waterborne Asphaltic Emulsion Coating: Minimum 2.5-mil dry film thickness.
      1. FABRICATION
         1. Fabricate detention doors and frames rigid, neat in appearance, and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Weld exposed joints continuously; grind, fill, dress, and make smooth, flush, and invisible. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
         2. Tolerances: Fabricate detention doors and frames to comply with manufacturing tolerances indicated in NAAMM-HMMA 863.

Retain "Removable Jamb Faces" paragraph below if required to provide access for attachment of frames to embedded anchors.

* + - * 1. Removable Jamb Faces: Provide removable jamb faces where required for access to embedded anchors. Fabricate to allow secure reattachment of removable face with security fasteners.
        2. Fabricate multiple-opening detention frames with mullions that have closed tubular shapes and with no visible seams or joints.
        3. Exterior Detention Doors: Provide weep-hole openings in bottoms of detention doors to permit entrapped moisture to escape. Seal joints in top edges of detention doors against water penetration.
        4. Hardware Preparation: Factory prepare detention doors and frames to receive mortised hardware, including cutouts, reinforcement, mortising, drilling, and tapping, according to final Door Hardware Schedule and templates provided by detention door hardware supplier.

Reinforce detention doors and frames to receive surface-mounted door hardware. Drilling and tapping may be done at Project site.

Locate door hardware according to NAAMM-HMMA 863.

* + - * 1. Factory cut openings in detention doors.
        2. Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
      1. GENERAL FINISH REQUIREMENTS
         1. Comply with NAAMM-NOMMA 500, "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
         2. Finish detention doors and frames after assembly.
      2. METALLIC-COATED STEEL SHEET FINISHES
         1. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A780.
         2. Factory Priming for Field-Painted Finish: Apply shop primer specified in "Shop Primer" Subparagraph below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mil.

Revise "Shop Primer" subparagraph below if another primer is required. Coordinate with Section 099123 "Interior Painting" and Section 099114 "Exterior Painting."

Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10 acceptance criteria; recommended by primer manufacturer for zinc-coated steel; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

For exact finish, insert names of coating manufacturers and products.

* + - 1. STEEL SHEET FINISHES

Revise "Surface Preparation" paragraph below if other cleaning methods are appropriate.

* + - * 1. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with [**SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning"**] [**or**] [**SSPC-SP 8, "Pickling"**] <**Insert surface preparation method**>.
        2. Factory Priming for Field-Painted Finish: Apply shop primer specified in "Shop Primer" Subparagraph below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mil.

Revise "Shop Primer" subparagraph below if another primer is required. Coordinate with Section 099123 "Interior Painting" and Section 099114 "Exterior Painting."

Shop Primer: Manufacturer's or fabricator's standard, fast-curing, corrosion-inhibiting, lead- and chromate-free, universal primer complying with SDI A250.10 acceptance criteria; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

For exact finish, insert names of coating manufacturers and products.

* + - 1. STAINLESS-STEEL FINISHES
         1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
         2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

Retain first subparagraph below for directional finishes.

Run grain of directional finishes with long dimension of each piece.

When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

Finish in "Directional Satin Finish" subparagraph below is most common. Consult manufacturers for other finishes.

Directional Satin Finish: No. 4.

* + - 1. SECURITY FASTENERS
         1. Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific fastener type. Provide drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:

Pinned Torx-Plus in "Drive-System Type" subparagraph below is the most commonly used security-fastener drive system for detention work. Insert additional security fastener types with other drive systems and head styles if necessary for special applications. See the Evaluations.

Drive-System Type: [Pinned Torx-Plus] [Pinned Torx] <Insert system>.

Revise "Fastener Strength" subparagraph below if different fastener strength is required.

Fastener Strength: 120,000 psi.

Socket Button Head Fasteners:

Heat-treated alloy steel, ASTM F835.

Stainless steel, ASTM F879, Group 1 CW.

Socket Flat Countersunk Head Fasteners:

Heat-treated alloy steel, ASTM F835.

Stainless steel, ASTM F879, Group 1 CW.

Socket Head Cap Fasteners:

Heat-treated alloy steel, ASTM A574.

Stainless steel, ASTM F837, Group 1 CW.

Protective Coatings for Heat-Treated Alloy Steel:

Zinc and clear trivalent chromium where indicated.

Zinc phosphate with oil, ASTM F1137, Grade I, or black oxide unless otherwise indicated.

* + - 1. SEALANTS
         1. Polyurethane Security Sealants: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with low movement.
         2. Epoxy Security Sealants: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with no movement.
      2. ACCESSORIES
         1. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
         2. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch thick; with minimum 1/2-inch diameter, headed studs welded to back of plate.
         3. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
         4. Pass-Through Openings: Fabricate flush openings using 0.093-inch thick, interior channels of same material as detention door faces, inverted to be flush with openings, welded to inside of both face sheets and with corners fully welded. Mount shutters on non-inmate side of detention doors. Reinforce for locks and food-pass hinges.

Retain "Inset Shutters" or "Overlapping Shutters" subparagraph below.

Inset Shutters: Fabricate from two steel plates, 0.123 inch thick, of same material as detention door face sheets, spot welded together and sized to inset inside opening and to prevent inmate tampering of lock and hinges.

Overlapping Shutters: For surface application on non-inmate side of door. Fabricate from a single steel plate, of same material as detention door face sheets, 0.187 inch thick, sized to overlap food-pass openings by 1/2 inch.

* + - * 1. Detention Door Louvers: Fabricate flush louver openings using 0.093-inch thick, interior steel channels of same material as detention door faces, welded to inside of both detention door face sheets and with corners fully welded. Provide welded, inverted V- or Y-shaped vanes allowing specified airflow, fabricated from same material as detention door face sheets, 0.093 inch thick, and spaced so no rigid flat instrument can pass through.

Reinforcement: Reinforce louvers that exceed 18 inches in height at louver midpoint with 1/4-by-1-1/2-inch square, vertical rectangular steel bar or 3/4-inch diameter, vertical steel bar.

Airflow: <**Insert airflow in cfm and static-pressure loss in inch wg**>.

Exterior Detention Door Insect Screens: Fabricated from 12-by-12 mesh of 0.028-inch diameter, stainless-steel wire or from perforated metal of same material and thickness as detention door face sheet with 1/8-inch diameter holes spaced 1 inch o.c.; where indicated.

* + - * 1. Speaking Apertures: Consist of a rectangular pattern of holes, minimum 1 inch high by 4 inches wide, with holes 1/4 inch in diameter. Locate holes in both face sheets directly across from each other and spaced not more than 1 inch o.c. vertically and horizontally. Provide 0.067-inch thick, pressed-steel baffles in interior of detention door between hole patterns to prevent passage of objects.
        2. Gun Ports: Fabricate units to comply with UL 752 and to resist same security level as detention doors in which they are installed.

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
          2. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention frame connections before detention frame installation.
          3. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
          4. Inspect embedded plate installations before installing detention frames to verify that plate installations comply with requirements. Prepare inspection reports.

Remove and replace plates where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.

Perform additional inspections to determine compliance of replaced or additional work.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION
         1. Remove welded-in shipping spreaders installed at factory.
         2. Before installation and with shipping spreaders removed, adjust detention frames for squareness, alignment, twist, and plumbness to the following tolerances:

Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb and perpendicular to frame head.

Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of face.

Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of door rabbet.

Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

* + - 1. INSTALLATION
         1. General: Install detention doors and frames plumb, rigid, properly aligned, and securely fastened in place, complying with Drawings, schedules, and manufacturer's written instructions.
         2. Anchorage: Set detention frame anchorage devices according to details on Shop Drawings and according to anchorage device manufacturer's written instructions.

Retain one or more of "Masonry Anchors," "Embedded Anchors," and "Postinstalled Anchors" subparagraphs below. Coordinate with anchors retained in "Jamb Anchors" paragraph in "Detention Frames" Article.

Masonry Anchors: Coordinate frame installation to allow for solidly filling space between frames and masonry with grout.

Embedded Anchors: Install embedded plates in wall surrounding frame openings to match frame angle locations.

Postinstalled Anchors: Drill holes in existing construction at locations to match bolt locations, and install bolt expansion shields or inserts.

* + - * 1. Where detention frames are fabricated in sections due to shipping limitations, assemble frames and install angle splices at each corner, of same material and thickness as detention frame, and extend at least 4 inches on both sides of joint.

Field splice only at approved locations. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.

Continuously weld and finish smooth joints between faces of abutted, multiple-opening, detention frame members.

Field Welding: Comply with the following requirements:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

Obtain fusion without undercut or overlap.

Remove welding flux immediately.

At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

Retain first paragraph below for extra corrosion protection. Some manufacturers feel that standard factory-applied, corrosion-resistant primer is adequate.

* + - * 1. Apply bituminous [**waterborne asphaltic emulsion**]coating to backs of frames before filling with grout.
        2. Placing Detention Frames: Install detention frames of sizes and profiles indicated. Set detention frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

Retain one of or both "Embedded Anchors" and "Postinstalled Anchors" subparagraphs below. Coordinate with anchors retained in "Jamb Anchors" paragraph in "Detention Frames" Article.

Embedded Anchors: Remove jamb faces from detention frames and set detention frames into opening. Weld steel connector angle to frame angle and to embedded plate with 1-inch long welds at each end of connector angle to form a rigid frame assembly that is solidly anchored. Reinstall jamb faces using security fasteners.

Postinstalled Anchors: Install bolt. After bolt is tightened, weld bolt head to provide nonremovable condition. Grind, dress, and finish smooth welded bolt head.

At fire-rated openings, install detention frames according to NFPA 80.

Install detention frames with removable stops located on non-inmate side of opening.

* + - * 1. Grout: Fully grout detention frame jambs and heads. Completely fill space between frames and adjacent substrates. Hand trowel grout and take other precautions, including bracing detention frames, to ensure that frames are not deformed or damaged by grout forces.

Retain "Security Sealant" paragraph below if required; coordinate with sealant specified in Part 2.

* + - * 1. Security Sealant: Apply [**polyurethane**] [**epoxy**] security sealant at all exposed gaps between detention frames and adjacent substrates.
        2. Swinging Detention Doors: Fit non-fire-rated detention doors accurately in their frames, with the following clearances:

Clearances in subparagraphs below are from NAAMM-HMMA 863.

Between Doors and Frames at Jambs and Head: 1/8 inch.

Between Edges of Pairs of Doors: 1/8 inch.

At Door Sills with Threshold: 3/8 inch.

At Door Sills without Threshold: 3/4 inch.

Between Door Bottom and Nominal Surface of Floor Covering: 1/2 inch.

* + - * 1. Sliding Detention Doors: Fit sliding detention doors in their frames according to manufacturer's written instructions and as required to allow doors to slide without binding.
        2. Fire-Rated Detention Doors: Install with clearances as specified in NFPA 80.
        3. Smoke-Control Detention Doors: Install according to NFPA 105.
        4. Installation Tolerances: Comply with installation tolerances indicated in NAAMM-HMMA 863.
        5. Glazing: Comply with installation requirements in Section 088853 "Security Glazing" unless otherwise indicated.
      1. FIELD QUALITY CONTROL
         1. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
         2. Detention work will be considered defective if it does not pass tests and inspections.
         3. Perform additional inspections to determine compliance of replaced or additional work.
         4. Prepare field quality-control certification[**endorsed by Detention Specialist**] that states installed products comply with requirements in the Contract Documents.

First paragraph below is quality-control test included in NAAMM-HMMA 863; delete if not required.

* + - * 1. For verification that construction complies with requirements, select one detention door at random from detention doors delivered to Project and have it cut in half or otherwise taken apart.

"Test Method" subparagraph below is based on subjective test method recommended by Habersham. NAAMM-HMMA 863 does not include specific test requirements.

Test Method: Verify weld strength by prying or chiseling door apart at edge seams, end channels, or stiffeners. Not more than 5 percent of welds may fail test.

If tested door fails, replace or rework all detention doors to bring them into compliance at Contractor's expense.

If tested door passes, replace tested door at Contractor's expense.

* + - * 1. Prepare test and inspection reports.
      1. ADJUSTING AND CLEANING
         1. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including detention doors and frames that are warped, bowed, or otherwise unacceptable.
         2. Clean grout and other bonding material off detention doors and frames immediately after installation.
         3. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780.
         4. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

After finishing smooth field welds, apply air-drying primer.

* + - * 1. Stainless-Steel Surfaces: Clean surfaces according to manufacturer's written instructions.

END OF SECTION 083463