

SECTION 119812

DETENTION DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
  - 1. Sliding and swinging detention doors and frames at secure areas; welded steel construction.
- B. Alternates: Not Applicable.
- C. Items To Be Installed Only: Not Applicable.
- D. Items To Be Furnished Only: Not Applicable.
- E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
  - 1. Section 042000 - UNIT MASONRY for building anchors into and grouting steel frames in masonry construction.
  - 2. Section 087100 - DOOR HARDWARE for door hardware for non-detention steel doors.
  - 3. Section 099000 - PAINTING AND COATING for field painting steel doors and frames.
  - 4. Section 119814 - DETENTION HARDWARE for detention hardware.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, fire-resistance rating, and finishes for each type of steel door and frame specified.
- B. LEED Submittals:
  - 1. Credit MRc4 - For products containing recycled content, provide documentation indicating percentages, by weight, of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content. Provide cost breakdowns for the total installed cost and material-only cost.

2. Credit MRc5 - For products and materials selected to comply with requirements for regional materials, provide product data indicating location of material manufacturer and point of extraction, harvest, and/or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
  3. Credit EQc4.1 - Manufacturers' product data for interior adhesives, sealants and sealant primers, including printed statement of VOC content.
  4. Credit EQc4.2 - Manufacturer's product data for interior field applied paints and coatings included printed statement of VOC content.
- C. Shop Drawings: In addition to requirements below, provide a schedule using same reference numbers for details and openings as those on Drawings:
1. Elevations of each door design.
  2. Direction of swing or slide.
  3. Inmate and non-inmate sides.
  4. Details of doors, including vertical and horizontal edge details, and metal thicknesses.
  5. Details of frames, including dimensioned profiles, and metal thicknesses.
  6. Locations of reinforcement and preparations for hardware.
  7. Details of each different wall opening condition.
  8. Details of anchorages, joints, field splices, and connections.
  9. Details of moldings, removable stops, and glazing.
  10. Details of conduit, junction boxes, and preparations for electrified door hardware.
- D. Samples for Verification:
1. For each type of exposed finish required, prepared on Samples not less than 3 by 5 inches (76 by 127 mm).
  2. For the following items, prepared on Samples about 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:
    - a. 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.
    - b. 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.
- E. Coordination Drawings: Drawings of each detention door and frame, drawn to scale, on which connections and interface with electrified control systems are shown.
- F. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.
- G. Qualification Data: For qualified Installer.
- H. Welding certificates.
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for detention doors and frames. Indicate metal thickness of each component of tested assembly and describe construction methods.

- J. Field quality-control reports documenting inspections of installed products.
- K. Other Informational Submittals:
  - 1. Examination reports documenting inspection of substrates, areas, and conditions.
  - 2. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
  - 3. Field quality-control certification signed by Contractor.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain detention doors and frames from single source from single manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- D. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at atmospheric pressure, according to NFPA 252 or UL 10B.
- E. Smoke-Control Detention Door Assemblies: Comply with NFPA 105.
- F. Preinstallation Conference: Conduct conference at Project site.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver detention doors and frames palleted, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
- B. Deliver detention frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Inspect units, on delivery, for damage. Minor damage may be repaired provided refinished items match new work and are approved by Designer; otherwise, remove and replace damaged items as directed.
- D. Store detention doors and frames under cover at building site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber.
  - 1. Provide minimum 1/4-inch (6-mm) space between each stacked unit to permit air circulation.

1.6 COORDINATION

- A. 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 concrete or masonry. Deliver such items to Project site in time for installation.

1.7 MAINTENANCE TOOLS

- A. Tool Kit: Provide six sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.

1.8 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Security Fasteners: Furnish not less than 1 box for each 50 boxes or fraction thereof, of each type and size of security fastener installed.

PART 2 - PRODUCTS

2.1 SLIDING DETENTION DOORS

- A. Manufacturers: Provide products from one of the following, or approved equal:
  - 1. American Steel
  - 2. Habersham
  - 3. Trussbilt
  - 4. Approved equal.
- B. Type and Operation: Sliding solid sheet steel and glass door, with manual [drive system] operation.
- C. Components:
  - 1. Door rollers shall be self-lubricating, incorporate sealed lifetime lubricated bearings and have a concave accurate engaging surface to provide for smooth quiet operation. Steel rollers are not acceptable.
  - 2. Roller axles shall be constructed of 8620 alloy cold drawn steel with a hardness of 58-62 Rockwell C.
  - 3. Roller/axle assembly shall provide for up/down and in/out adjustment of door.
  - 4. Roller track shall be constructed of a single solid piece of 1018 cold drawn steel bar.
  - 5. Door shall lock at the top and bottom in both the open and closed positions.
  - 6. The vertical lock bar shall be mechanically connected to the lock mechanism at all times.
  - 7. The locking mechanism shall include an automatic mechanical deadlock feature. Mechanism that hold the lock bar in place with spring or gravity pressure will not be accepted.

8. Vertical locking column shall be made from 10 GA steel tubing.
9. Top and bottom door guides must be designed to limit side motion of door to +/-0.030 inches or less to significantly reduce rattle-induced noise.
10. Bottom door guide shall have replaceable non-metallic wear pads to provide for smooth, quiet operation.

D. Locking: Lock shall operate as follows:

1. Key unlocking by manual operation at each door. Automatic locking upon door closure.
2. As part of the work of this section, monitor switch at each door shall indicate whether doors are open or closed at panel at control desk.

E. Cell Door Construction: Cell doors shall be constructed of 12 gage detention grade hollow metal s in configuration indicated on Drawings. All joints and edges shall be fully welded and ground smooth.

1. Vision Glass: Provide vision, privacy or electronic glass as indicated and specified below.
2. Food Pass: Provide food pass at all cell doors with plate door, hinges and snap lock equal to products of AirTeq Model 5017. Pass door shall be able to swing 180 degrees to a full door position when open.

F. Operation:

1. Manufacturers / basis of design: Subject tom compliance with specifications and drawings, provide the following or approved equal:
  - a. Basis of design: Cornerstone Detention Products, AirTeq Trackset 7205.
  - b. Cels Correctional Equipment, Inc.
  - c. Southern Steel Co.
  - d. Fries Correctional Equipment, Inc
2. Type: Provide manual slider consisting of door hanger, adjustable roller assembly, track, housing and bottom guide. Anchor frame to surrounding construction expansion bolts at head, jamb and sill.

G. Finish: Detention steel doors and frames shall be factory primed. Finish painting shall be provided as work of Section 099000, PAINTING AND COATING.

## 2.2 SWINGING DETENTION STEEL DOORS

A. Manufacturers: Provide products from one of the following, or approved equal:

1. TrussBilt.
2. American Steel.
3. Habersham

B. Type and Operation: Detention steel doors shall be hung on three heavy-duty, ball bearing hinges, especially designed for detention use. Doors shall be complete with closers, manual locks and pulls. Provide with switch in frame to indicate open or closed position.

1. Refer to Section 111925 Detention Hardware for specified hardware requirements.

C. Detention steel doors shall be 12 gauge steel, flush type, not less than 2 in. thick. Inner reinforcement shall be vertical steel channels full height of door, spaced not more than 6 in. o.c.,

resistance spot welded to face sheets, or inner reinforcement may be continuous true truss design of triangular form, resistance spot welded to face sheets. Interior of door shall be insulated to eliminate metallic ring. Vertical edges of doors shall be formed, tack welded and ground smooth. Weld 10 gauge steel channel to face sheets around full perimeter of door, with additional back-up reinforcement of 3/16 in. plate at hinges, drilled and tapped to receive screws. Provide special reinforced lock pockets for detention-type locks. Build in accessory items where indicated on Drawings and/or Door Schedules. Where shown or scheduled, doors shall have an observation panel with 3/4 in. laminated glass. All fasteners shall be torx pinhead type.

- D. Frame Construction: Frames for detention steel doors shall be made of 12 gage steel plate and continuously welded at the corners. Frames shall have continuous formed stops at the jambs and across the head. Provide four anchors per jamb. Anchors are to be not less than 1 in. x 8 in., of 14 gauge steel, with at least 6 in. extensions into adjacent construction. Frames shall be drilled and tapped for attaching three 4-1/2 in. institutional type hinges, which are full mortised into the door. Frames shall be provided with slot to receive the lock bolt, and a bolt keeper or dust box located behind the lock bolt slot to keep concrete or mortar from interfering with the operation of the lock bolt and hinge bolts.
- E. Finish: Factory applied prime coat and two-part epoxy finish coating to all ferrous metal surfaces of cell doors, housing, and ferrous metal hardware; in color selected by Designer.
- F. Finish: Detention steel doors and frames shall be factory primed. Finish painting shall be provided as work of Section 099000, PAINTING AND COATING.

## 2.3 DOOR ACCESSORIES

- A. Subject to compliance with specifications, provide products equivalent to the following:
  - 1. Manufacturer: Only from door assembly manufacturer.
  - 2. Factory install required accessories.
- B. Louvers:
  - 1. Welded inverted "Y" type construction providing free air delivery as specified.
  - 2. Opening: A flush opening fabricated using interior channels 0.093 in. (2.3 mm) minimum thickness, securely welded to the inside of both face sheets.
  - 3. Vanes: Not less than 0.093 in. (2.3 mm) thickness and spaced so no rigid flat instrument can be passed through them.
  - 4. Louvers of other designs, which meet the security requirements, can be qualified for this application.
- C. Speaking devices:
  - 1. A rectangular pattern of round holes, no more than 0.25 in. (6.4 mm) dia., in both face sheets directly across from each other.
  - 2. The minimum size of the rectangular hole pattern shall be 1 in. (25 mm) high x 4 in. (102 mm) wide with holes spaced no more than 1 in. (25 mm) o.c. vertically and horizontally.
  - 3. The interior of the door between the rectangular hole patterns shall be baffled using pressed steel sections, not less than 0.042 in. (1.0 mm), so that no objects can be passed through.

- D. Food pass/cuff port openings:
  - 1. Provide food pass at all cell doors with plate door, hinges and snap lock. Pass door shall be able to swing 180 degrees to a full door position when open
  - 2. The food pass opening shall be fabricated using interior Zee shaped formed sections 0.093 in. (2.3 mm) minimum thickness, securely welded to the inside of both face sheets. The four corner seams shall be continuously arc welded internally. The finished opening shall be of such construction that it cannot be dismantled or otherwise affected by tampering or scraping.
  - 3. The food pass shutter door shall be constructed from 0.067 in. (3.1 mm) thickness steel, press formed, hollow metal flush assembly with a 0.167 (4.2mm) backup plate on the inmate side.
  - 4. The shutters shall be treated for maximum paint adhesion and given a shop coat of rust inhibitive primer.
- E. Fasteners: All exposed or accessible fasteners shall be TORX security type as follows:
  - 1. Tamper-resistant center pin reject style, fasteners that may be removed only with manufacturer's specially designed extraction tool.
    - a. Acceptable Product: "Torx Plus" Security Torx five lobe fasteners with pin reject by Acument Global Technologies, Holdbrook Manufacturing Inc., Tamperproof Screw Co, Inc., or approved equal.
    - b. Provide length suitable for the application.
    - c. Unless otherwise required, provide flat head, flush to surface fasteners.

## 2.4 FIELD INSTALLED GLASS & GLAZING

- A. Subject to compliance with specifications, provide products equivalent to the following:
  - 1. Manufacturer: LTI Smart Glass Inc.; [www.LTISmartGlass.com/](http://www.LTISmartGlass.com/).
  - 2. Product: SmartGard GCP1116 Security Glazing.
  - 3. Product: SmartGard GCP1316 Security Glazing.
- B. Typical components:
  - 1. 4 Ply glass: Provide the following components:
    - a. 0.125" Heat Strengthened
    - b. 0.050" Bonding Interlayer
    - c. 0.177" Uncoated Polycarbonate Sheet
    - d. 0.025" Bonding Interlayer
    - e. 0.177" Uncoated Polycarbonate Sheet
    - f. 0.050" Bonding Interlayer
    - g. 0.125" Heat Strengthened
  - 2. 5 Ply glass: Provide the following components:
    - a. 0.125" Heat Strengthened
    - b. 0.050" Bonding Interlayer
    - c. 0.118" Uncoated Polycarbonate Sheet
    - d. 0.025" Bonding Interlayer
    - e. 0.236" Uncoated Polycarbonate Sheet
    - f. 0.025" Bonding Interlayer
    - g. 0.118" Uncoated Polycarbonate Sheet
    - h. 0.125" Heat Strengthened

- C. One-Way Vision Glass: At control room and areas indicated, provide one-way vision glass, aka “mirror/one-way glass”, equal to Pilkington “Mirropane”.
- D. Electrified glass: LTI Electrified Switchable Privacy Glass or approved equal.
- E. Performance: Meets ASTM F1915 as follows:
  - 1. 4 ply glass: Grade 3 / 20 minute attack.
  - 2. 5 ply glass: Grade 2 / 40 minute attack.
- F. Glazing assemblies: Ensure a minimum of approximately 1 inch edge engagement in the frame with sufficient rabbet depth to allow for expansion (approximately 1/16”/FT). Only use sealants and gaskets that are compatible with polycarbonate.
- G. Glass moldings and stops:
  - 1. Where shown, provide doors with steel moldings to secure glazing in glass sizes and thicknesses required.
  - 2. Fixed glass molding: Not less than 0.093 in. (2.3 mm), and spot-welded to both face sheets 3.0 in. (76 mm) o.c. maximum.
  - 3. For security glazing required: Provide pressed steel angle glazing stops (or “Z” or plate type stops depending on glass thickness), no less than 0.093 in. (2.3 mm) thickness. Angle stops shall be mitered or notched and tight fitting at the corner joints, and secured in place using 1/4 - 20 or 1/4 - 28 button head tamper resistant screws with spacing necessary to satisfy the performance criteria.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention doors and frames.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention frame connections before detention frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention doors and frames.
- D. Inspect embedded plate installations before installing detention frames to verify that plate installations comply with requirements. Prepare inspection reports.
  - 1. Remove and replace plates where inspections indicate noncompliance with specified requirements. Re-inspect after repair or replacement.
  - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory.
- B. Prior to installation and with shipping spreaders removed, adjust detention frames for squareness, alignment, twist, and plumbness to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb and perpendicular to frame head.
  - 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of face.
  - 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of door rabbet.
  - 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

### 3.3 INSTALLATION

- A. General: Install detention doors and frames plumb, rigid, properly aligned, and securely fastened in place, complying with Drawings, schedules, and manufacturer's written recommendations.
- B. Anchorage: Set detention frame anchorage devices according to details on Shop Drawings and per anchorage device manufacturer's written instructions.
  - 1. Masonry Anchors: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
  - 2. Embedded Anchors: Install embedded plates in wall surrounding frame openings to match frame angle locations.
  - 3. Post-installed Expansion Anchors: Drill holes in existing construction at locations to match bolt locations and install bolt expansion shields or inserts.
- C. Assemble detention frames fabricated in sections. Install angle splices at each corner, of same material and thickness as detention frame, and extend at least 4 inches (102 mm) on both sides of joint.
  - 1. Field splice only at approved locations. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.
  - 2. Continuously weld and finish smooth joints between faces of abutted, multiple-opening, detention frame members.
  - 3. Field Welding: Comply with the following requirements:
    - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    - b. Obtain fusion without undercut or overlap.
    - c. Remove welding flux immediately.
    - d. 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.

- D. 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 and spreaders, leaving surfaces smooth and undamaged.
  - 1. 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- (25-mm-) long welds at each end of connector angle to form a rigid frame assembly solidly anchored. Reinstall jamb faces using security fasteners.
  - 2. Postinstalled Expansion Anchors: Install bolt. After bolt is tightened, weld bolt head to provide nonremovable condition. Grind, dress, and finish smooth welded bolt head.
  - 3. At fire-rated openings, install detention frames according to NFPA 80.
  - 4. Install detention frames with removable stops located on non-inmate side of opening.
- E. 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.
- F. Swinging Detention Doors: Fit non-fire-rated detention doors accurately in their frames, with the following clearances:
  - 1. Between Doors and Frames at Jambs and Head: 1/8 inch (3.2 mm).
  - 2. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm).
  - 3. At Door Sills with Threshold: 3/8 inch (9.5 mm).
  - 4. At Door Sills without Threshold: 3/4 inch (19.1 mm).
  - 5. Between Door Bottom and Nominal Surface of Floor Covering: 1/2 inch (12.7 mm).
- G. 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.
- H. Fire-Rated Detention Doors: Install with clearances as specified in NFPA 80.
- I. Installation Tolerances: Comply with installation tolerances indicated in HMMA 863.

### 3.4 FIELD QUALITY CONTROL

- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Remove and replace detention work where inspections indicate that work does not comply with specified requirements.
- C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- D. Prepare field quality-control certification that states installed products and their installation comply with requirements in the Contract Documents.

- E. Test Method: Verify weld strength by prying or chiseling door apart at edge seams, end channels, or stiffeners. Not more than five percent of welds may fail test.
  - 1. If tested door fails, replace or rework all detention doors to bring them into compliance at Contractor's expense.
  - 2. If tested door passes, replace tested door at Contractor's expense.

### 3.5 ADJUSTING AND CLEANING

- A. 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.
- B. Clean grout and other bonding material off detention doors and frames immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
  - 1. After finishing smooth field welds, apply air-drying primer.

END OF SECTION