SECTION 233713.43 - SECURITY REGISTERS AND GRILLES

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

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY
         1. Section includes security [**registers**] [**and**] [**grilles**].
         2. Related Requirements:

Retain Sections in subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to registers and grilles.

Section 233713.13 "Air Diffusers" for various types of air diffusers.

Section 233713.23 "Registers and Grilles" for registers and grilles.

Section 233716 "Fabric Air Diffuser Devices" for continuous tubular diffusers.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the er-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 indicated, include the following:

Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.

Register and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

Retain "Samples for Initial Selection" paragraph below if colors and other characteristics are not preselected, specified, or scheduled.

* + - * 1. Samples for Initial Selection: For registers and grilles with factory-applied color finishes.
        2. Samples for Verification: For registers and grilles, in manufacturer's standard sizes to verify color selected.

Retain "Coordination Drawings" paragraph below for situations where limited space necessitates maximum utilization for efficient installation of different components or if coordination is required for installation of products and materials by separate installers. Coordinate paragraph with other Sections specifying products listed below. Preparation of coordination drawings requires the participation of each trade involved in installations within the limited space.

* + - * 1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Revise subparagraphs below to suit Project.

Ceiling suspension assembly members.

Method of attaching hangers to building structure.

Size and location of initial access modules for acoustical tile.

Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

Duct access panels.

* + - * 1. Source quality-control reports.
      1. MAINTENANCE
         1. Special Tools:

One bar deflection key for every five supply grilles and/or every five return grilles.

One operator key for every five supply registers and/or every 5 return or exhaust registers.

Two keys or socket wrenches for each type of damper adjustment screw or device on manual damper regulators.

Uuse subparagraph below with projects requiring secure patient or inmate areas.

One tool for each type and size Torx center pin fastener.

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. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

Descriptions of registers and grilles include required attributes that define air outlets and inlets. Each description must be revised to include a drawing designation. If there is more than one type of outlet or inlet for a particular description, copy the paragraph for each type required and revise each copy to define each required type. Assign each type a different drawing designation.

* + - 1. SECURITY REGISTERS
         1. Unless otherwise specified, fabricate registers of steel with factory applied white baked-on enamel finish.
         2. Fabricate grille, register faces, and frames of aluminum with an etched and acrylic coated finish when installed in shower, can washing, dishwasher, food serving and dining rooms, kitchens, and swimming pool areas.

Use paragraph below only when installing grilles and registers in plaster ceilings.

* + - * 1. Mounting Frames for Registers and Grilles:

Frames (Security Type): Fabricate frames, as shown in detail on drawings, of materials and finish to match mating grille or register face.

Weld exposed joints and ground flush.

Completely close corner joints with neatly welded back trim.

Use paragraph below for exhaust air with limited security capability. These registers are more costly and heavier than non-secure registers. Typical areas of use are occupied by staff where inmates are supervised at maximum and medium facilities.

* + - * 1. Staff Return (SRR) and Staff Exhaust (SER) Registers:

Perforated Face Plate:

Steel: Minimum 12 gage plate.

Hole Size: 1/2 inch - 3/16 inch square holes.

Hole Spacing: 11/16 inch - 1 inch on center.

If space is available, it is preferable to install accessible volume damper upstream of register.

Damper: Opposed blade, constructed of steel, adjustable thru face with removable key.

Register Sleeve: 10 gage cold rolled steel, formed with flanged face, and welded seams.

Use paragraph below for supply, return and exhaust when air distribution is needed in secure areas. These registers are costly, heavy and have poor air distribution characteristics. Typical areas of use are areas occupied by unsupervised inmates at maximum and medium facilities (except precast or prefab cells).

* + - * 1. Inmate Supply (ISR), Inmate Return (IRR) and Inmate Exhaust (IER) Registers:

Perforated Face Plate: Continuously welded to register sleeve.

Steel: Minimum 12 gage plate.

Hole Size: 1/4 inch dia. holes.

Hole Spacing: 3/8 inch staggered centers.

Register Sleeve: 10 gage cold rolled steel formed with flanged face and welded seams.

If space is available, it is preferable to install accessible volume damper upstream of register.

Damper: Opposed blade, constructed of steel, adjustable thru face with removable key.

Use subparagraph below when ductwork penetrates cell security walls, and when any duct dimension is over 6 inches. Install security bars on 4 inch centers. If duct height is over 12 inches provide horizontal security bars in ductwork so 5 inch ball cannot pass. Refer to construction work drawings for security wall locations.

Security Bar: 1/2 inch x 1 inch plate steel bar mounted vertically (horizontally as required) and welded to register sleeve.

Use paragraph below for supply, return and exhaust when air distribution is needed in secure areas. These registers are costly, heavy and have poor air distribution characteristics. Typical areas of use are areas occupied by unsupervised inmates at maximum and medium facilities (except precast or prefab cells).

* + - * 1. Inmate Supply (ISRA), Inmate Return (IRRA) and Inmate Exhaust (IERA) Registers - Type A:

Face Plate: Continuously welded to register sleeve.

Use subparagraph below for supply, return and exhaust when air distribution is needed in secure areas. these registers are costly, heavy and have poor air distribution characteristics. Typical areas of use are areas occupied by unsupervised inmates at maximum and medium facilities (except precast or prefab cells).

Steel: Minimum 3/16 inch steel plate.

Hole Size: 1/4 inch dia. holes.

Hole Spacing: 3/8 inch staggered centers.

Register Sleeve: 10 gage cold rolled steel formed with welded seams.

Security Angle Frame: 1 x 1 x 3/16 inch shipped loose for field installation.

If space is available, it is preferable to install accessible volume damper upstream of register.

Damper: Opposed blade, constructed of steel, adjustable thru face with removable key.

Use subparagraph below when ductwork penetrates cell security walls, and when any duct dimension is over 6 inches. Install security bars on 4 inch centers. If duct height is over 12 inches provide horizontal security bars in ductwork so 5 inch ball cannot pass. Refer to construction work drawings for security wall locations.

Security Bar: 1/2 inch x 1 inch plate steel bar mounted vertically (horizontally as required) and welded to register sleeve.

Use subparagraph below for supply, return and exhaust when air distribution is needed in secure areas. these registers are costly, heavy and have poor air distribution characteristics. Typical areas of use are areas occupied by unsupervised inmates at maximum and medium facilities (except precast or prefab cells).

* + - * 1. Shower Room Supply (SHSR-AL) and Shower Room Exhaust (SHER-AL) Registers:

Face Plate: Continuously welded to grille sleeve.

Steel: Minimum 3/16 inch steel plate.

Hole Size: 1/4 inch dia. holes.

Hole Spacing: 3/8 inch staggered centers.

If space is available, it is preferable to install accessible volume damper upstream of register.

Damper: Opposed blade, fabricated of aluminum, adjustable thru face with removable key.

Register Sleeve: 8 gage aluminum, welded construction.

Security Angle Frame: 1 x 1 x 3/16 inch aluminum angles, shipped loose for field installation

Use subparagraph below when ductwork penetrates cell security walls, and when any duct dimension is over 6 inches. Install security bars on 4 inch centers. If duct height is over 12 inches provide horizontal security bars in ductwork so 5 inch ball cannot pass. Refer to construction work drawings for security wall locations.

Security Bar: 1/2 inch x 1 inch plate steel bar mounted vertically (horizontally as required) and welded to register sleeve.

Use paragraph below for supply air when good air distribution is needed with limited security capability. these registers are more costly and heavier than non-security registers. Typical areas of use are the areas occupied by staff, where inmates are supervised and above 14 foot height at maximum and minimum facilities.

* + - * 1. Staff Supply Register (SSR):

Face Plate: 10 gage steel with 20 gage frame with reinforced welded corners.

Louvers: Individually adjustable, double deflection type constructed of 24 gage steel.

Damper: Opposed blade damper fabricated of steel, adjustable thru face with removable key.

Use paragraph below for exhaust and return of all rooms, except showers and toilets. these registers are cost effective and lightweight. typical areas of use are in the administration building at maximum and medium facilities and all buildings at minimum facilities where the moisture level is not high.

* + - * 1. Non-Secure Return (NSRR) and Non Secure Exhaust (NSER) Registers: Fixed single deflection type.

Register Face: 20 gage steel construction of same material as bars.

Face Bars/Vanes: Installed in register face.

Deflection Angle: 45 degrees.

Nominal Bar/Vane Spacing: 0.66 inch or 0.75 inch on center.

Damper Assembly: Opposed multi-blade type consisting of frame of screwdriver slot blades, and key operated movement of the locking type.

Operators: Key operated type projecting through frame or screwdriver slot. Operator keys are removable or may be permanently driven in place, as directed.

Construction for use with Factory Painted Register Faces: Galvanized steel factory finished with baked on black enamel, unless otherwise approved by the Director’s Representative.

Use paragraph below for exhaust of showers, toilets and janitor’s closets. These registers are cost effective and lightweight. Typical areas of use are in the administration building at maximum and medium facilities and all buildings at minimum facilities where the moisture level is high.

* + - * 1. Non-Secure Exhaust Register (NSEER-AL): Fixed single deflection type.

Register Face: Minimum 0.55 inch aluminum construction of same material as bars.

Face Bars/Vanes: Installed in register face.

Deflection Angle: 45 degrees.

Nominal Bar/Vane Spacing: 0.66 inch or 0.75 inch on center.

Sidewall registers shall have horizontal face bars/vanes.

Damper Assembly: Opposed multi-blade type consisting of frame or screwdriver slot blades, and key operated movement of the locking type.

Operators: Key operated type projecting through frame or screwdriver slot. Operator keys are removable or may be permanently driven in place, as directed.

Construction for use with Aluminum Register Faces: Aluminum with etched or acrylic finish.

Use paragraph below in areas where psychiatric inmates are housed.

* + - * 1. Suicide Deterrent Register (SDR):

Face Plate: Continuously welded to register sleeve.

Steel: Minimum 3/16 inch steel plate.

Hole Size: 3/16 inch dia. holes.

Hole Spacing: 9/32 inch staggered centers

Register Sleeve: 3/16 inch cold rolled steel formed with welded seams.

Angle Frame: 1-1/2 x 1-1/2 x 3/16 inch angle iron welded together for field installation.

If space is available, it is preferable to install accessible volume damper upstream of register.

Damper: Opposed blade, constructed of steel, adjustable thru face with removable key.

Security Bar: 3/4 inch dia. steel bar mounted vertically (horizontally as required) and welded to register sleeve.

Copy paragraphs below and re-edit for each product.

Insert number to complete drawing designation for each product required. Use these designations on Drawings to identify each product.

* + - * 1. Security Register <**Insert drawing designation**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12401) Subject to compliance with requirements, provide products by one of the following:

[Anemostat Products; a Mestek company](http://www.specagent.com/Lookup?uid=123457029473).

[Price Industries](http://www.specagent.com/Lookup?uid=123457029479).

[Titus; brand of Johnson Controls International PLC, Global Products](http://www.specagent.com/Lookup?uid=123457029480).

Approved equivalent.

Security Level: [**Maximum**] [**Medium**] [**Minimum**] [**and suicide deterrent**].

Application: [**Ducted return**] [**Air transfer**] [**Barrier**].

Material: [**Steel**] [**Aluminum**].

Material Thickness: [**0.19 inch (4.8 mm)**] <**Insert dimension**>.

Finish: [**Baked enamel, white**] [**Baked enamel, color selected by Architect**] <**Insert finish**>.

Face Arrangement:

Shape: [**Square**] [**Rectangular**] [**Round**].

Design: [**Fixed bar**] [**Perforated**] [**Lattice**].

Frame: [**Yes**] [**No**].

Deflection: [**Zero**] [**38**] degrees.

Core: [**None**] [**Louvered**].

3/16-inch- (5-mm-) thick, front lattice plate with 2-by-2-inch- (50-by-50-mm-) square holes and 1-inch (25-mm) frets, 0.135-inch (3.43-mm) wire mesh, and 1/4-inch- (6-mm-) thick backer plate.

3/16-inch- (5-mm-) thick, perforated faceplate with 5/16-inch- (8-mm-) diameter holes spaced 7/16 inch (11 mm) o.c., staggered at 60 degrees.

1-1/2-inch (38-mm) bars and mandrel tubes and rods with [**zero**] [**15**]-degree deflection in 1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) angle border.

1-3/8-inch (35-mm) bars and double mandrel tubes with [**zero**] [**15**]-degree deflection in 1-3/4-inch (45-mm) angle border.

Damper Operation: [**None**] [**Face operated**] [**Rear operated**].

Damper Type: [**Multi-Shutter**] [**Adjustable opposed blade**] [**NRTL listed, opposed blade, spring closing, and with fusible link for 160 deg F (71 deg C)**].

Wall Sleeve: [**3/16 inch (5 mm) welded to face**] [**1/8 inch (3 mm) welded to face**] [**Mechanically fastened to border**].

Mounting: [**1-by-1-by-3/16-inch (25-by-25-by-5-mm) retaining angle frame**] [**1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) retaining angle frame**] [**1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) cast-in-place frame and tamperproof machine screws**].

* + - 1. SECURITY GRILLES

Use subparagraph below for supply, return and exhaust when air distribution is needed in secure areas. these registers are costly, heavy and have poor air distribution characteristics. Typical areas of use are areas occupied by unsupervised inmates at maximum and medium facilities (except precast or prefab cells).

* + - * 1. Inmate Exhaust Grille (IEG):

Face Plate: Continuously welded to grille sleeve.

Steel: Minimum 3/16 inch steel plate.

Hole Size: 1/4 inch diameter.

Hole Spacing: 3/8 inch staggered centers.

Grille Sleeve: 10 gage cold rolled steel formed with welded seams.

Security Angle Frame: 1 x 1 x 3/16 inch shipped loose for field installation.

Security Bar: 1/2 inch x 1 inch plate steel bar, mounted vertically (horizontally as required) and welded to grille sleeve.

Copy paragraphs below and re-edit for each product.

Insert number to complete drawing designation for each product required. Use these designations on Drawings to identify each product.

* + - * 1. Security Grille <**Insert drawing designation**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12402) Subject to compliance with requirements, provide products by one of the following:

[Anemostat Products; a Mestek company](http://www.specagent.com/Lookup?uid=123457029483).

[Price Industries](http://www.specagent.com/Lookup?uid=123457029489).

[Titus; brand of Johnson Controls International PLC, Global Products](http://www.specagent.com/Lookup?uid=123457029490).

Approved equivalent.

Security Level: [**Maximum**] [**Medium**] [**Minimum**] [**and suicide deterrent**].

Application: [**Ducted return**] [**Air transfer**] [**Barrier**].

Material: [**Steel**] [**Aluminum**].

Material Thickness: [**0.19 inch (4.8 mm)**] <**Insert dimension**>.

Finish: [**Baked enamel, white**] [**Baked enamel, color selected by Architect**] <**Insert finish**>.

Face Arrangement:

Shape: [**Square**] [**Rectangular**] [**Round**].

Design: [**Fixed bar**] [**Perforated**] [**Lattice**].

Frame: [**Yes**] [**No**].

Deflection: [**Zero**] [**38**] degrees.

Core: [**None**] [**Louvered**].

3/16-inch- (5-mm-) thick, front lattice plate with 2-by-2-inch- (50-by-50-mm-) square holes and 1-inch (25-mm) frets, 0.135-inch (3.43-mm) wire mesh, and 1/4-inch- (6-mm-) thick backer plate.

3/16-inch- (5-mm-) thick perforated faceplate with 5/16-inch- (8-mm-) diameter holes spaced 7/16 inch (11 mm) o.c., staggered at 60 degrees.

1-1/2-inch (38-mm) bars and mandrel tubes and rods with [**zero**] [**15**]-degree deflection in 1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) angle border.

1-3/8-inch (35-mm) bars and double mandrel tubes with [**zero**] [**15**]-degree deflection in 1-3/4-inch (45-mm) angle border.

Wall Sleeve: [**3/16 inch (5 mm) welded to face**] [**1/8 inch (3 mm) welded to face**] [**Mechanically fastened to border**].

Mounting: [**1-by-1-by-3/16-inch (25-by-25-by-5-mm) retaining angle frame**] [**1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) retaining angle frame**] [**1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) cast-in-place frame and tamperproof machine screws**].

* + - 1. SOURCE QUALITY CONTROL
         1. Verification of Performance: Rate registers and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine areas where registers and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
          2. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. INSTALLATION
          1. Install registers and grilles level and plumb.
          2. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
          3. Install registers and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
       3. ADJUSTING
          1. After installation, adjust registers and grilles to air patterns indicated, or as directed, before starting air balancing.
          2. After installation, adjust registers and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713.43