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USACE / NAVFAC / AFCESA / NASA | **NASA-15852S (December 2005)**

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UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 15852S

DIFFUSERS
12/05

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NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers air-diffusion devices that are connected to ductwork or mounted in equipment, except as otherwise provided.

Air-diffusion devices shall be identified on the drawings with symbols provided. Where deviations from standards occur, the user shall devise a new symbol within the format used herein.

Natural aluminum diffusers are unprotected unless specified to be furnished with clear acrylic or anodizing finishes. Normally, aluminum diffusers specified without further qualification are supplied with factory baked enamel finish. Steel diffusers and grilles should be specified with a factory baked enamel finish.

Drawings shall show type of DLB frame, bar spacing if other than specified, bar deflection, blanking if any, and type of damper.

Show frame style, width, and screw or clip fastening on drawings.

Drawings shall show linear slot width and number of slots, if other than specified.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.
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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.
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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 113	(1990) Method of Testing for Room Air Diffusion
ASHRAE-03	(1997) Handbook, Fundamentals (IP Edition)
ASHRAE-04	(1997) Handbook, Fundamentals (SI Edition)
ASHRAE-06	(1997) Handbook, HVAC Systems and Equipment (IP Edition)
ASHRAE-Hdbk SE-SI	(2000) Handbook, HVAC Systems and Equipment (SI Edition)

1.2 GENERAL REQUIREMENTS

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NOTE: If Section 15003S GENERAL MECHANICAL PROVISIONS is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.
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Section 15003S GENERAL MECHANICAL PROVISIONS applies to work specified in this section.

Material, Equipment, and Fixture Lists shall include the manufacturer's

style or catalog numbers, specification and drawing reference numbers, warranty information, and fabrication site information.

Records of Existing Conditions shall be submitted consisting of the results of Contractor's survey of work area conditions and features of existing structures and facilities within and adjacent to the jobsite. Commencement of work shall constitute acceptance of existing conditions.

Fabrication Drawings shall be submitted for air-diffusion devices consisting of fabrication and assembly details to be performed in the factory.

Manufacturer's Standard Color Chart shall indicate the manufacturer's standard color selections and finishes for air-diffusion devices.

1.3 PERFORMANCE REQUIREMENTS

Air diffusion devices shall be certified as having been tested and rated in accordance with ASHRAE-Hdbk SE-SI, Chapter 17; ASHRAE-04, Chapter 31 ASHRAE-06, Chapter 17; ASHRAE-03, Chapter 31, and ASHRAE 113, where such certification is required.

Equipment and Performance Data shall be submitted for air-diffusion devices consisting of [sound data in terms of Noise Criteria (NC) index for the capacity range of the device.] [sound data in terms of sound-power level in octave bands second through eighth and Noise Criteria (NC) index for the capacity range of the device. Where room attenuation is not specified or indicated, 18 decibels shall be assumed. Where space or sound data are not specified or indicated, NC40 shall be assumed.]

1.4 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01330 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy,

Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

The following shall be submitted in accordance with paragraph entitled, "General Requirements," of this section.

Material, Equipment, and Fixture Lists
Records of Existing Conditions

SD-02 Shop Drawings

Fabrication Drawings shall be submitted for air-diffusion devices in accordance with paragraph entitled, "General Requirements," of this section.

Installation Drawings shall be submitted for air-diffusion devices in accordance with the paragraph entitled, "Installation," of this section.

SD-03 Product Data

Equipment and Performance Data shall be submitted for air-diffusion devices in accordance with paragraph entitled, "Performance Requirements," of this section.

SD-04 Samples

Manufacturer's Standard Color Chart shall be submitted in accordance with paragraph entitled, "General Requirements," of this section.

SD-10 Operation and Maintenance Data

Operation and maintenance manuals shall be consistent with manufacturer's standard brochures, schematics, printed instructions, general operating procedures and safety precautions.

Manuals shall be provided for the following air-diffusion devices:

Type TS Supply Troffer
Type TSR Combination Supply and Return Troffer

PART 2 PRODUCTS

2.1 AIR-DIFFUSION DEVICE CONSTRUCTION

Air-diffusion device construction and mounting shall preclude flutter, rattle, or vibration. Refer to Section 15072S VIBRATION ISOLATION FOR AIR CONDITIONING EQUIPMENT for vibration isolation considerations. Devices shall have the modifications and accessories necessary for mounting in indicated surface construction.

[Color selection shall be from manufacturer's standard color chips.]

[Color selection shall match architectural background.]

[Color selection shall be as indicated.]

Supply diffusers shall be provided with combination damper and equalizing grid. Dampers shall be extracting-splitter type, except as otherwise indicated.

Air-diffusion device volume and pattern adjustments shall be made from the face of the device. Volume adjustments shall be made by [removable key] [tamper-deterring device].

Gaskets shall be provided for supply-terminal air devices mounted in finished surfaces.

2.2 TYPES OF AIR-DIFFUSION DEVICES

2.2.1 Type DRA

Type DRA supply diffuser shall be round with five or more expanding cones with beaded edges to provide hemispherically diffused discharge air. Cones shall be arranged to provide a minimum of [four] [_____] air paths which simultaneously diffuse air at 6 to 15 meter per minute 20 to 50 feet per minute (fpm) and aspirate room air at 25 to 35 percent of discharge volume.

Diffuser finish shall be baked enamel, and shall be constructed of aluminum.

Antismudge rings and extended cones shall be provided.

2.2.2 Type DRB

Type DRB supply diffuser shall be round with [four] [_____] more expanding cones to provide hemispherically diffused discharge air. Cones shall be arranged to provide a minimum of [three] [_____] air paths which simultaneously diffuse air at 6 to 15 meter per minute 20 to 50 fpm. Pattern adjustment shall range from horizontal to downward projection, and any intermediate point, when mounted on exposed ductwork.

Diffuser finish shall be baked enamel, and shall be constructed of aluminum.

[Integral] [Separate] antismudge ring and extended ceiling cone shall be provided.

2.2.3 Type DRC

Type DRC combination supply and return diffuser shall be round with four expanding cones. Cones shall be arranged to provide one return air path

and two supply air paths. A butterfly supply-air damper and an annular return-air damper shall be provided.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

[Antismudge ring shall be provided.]

2.2.4 Type DRE

Type DRE supply diffuser shall be round with [three] [_____] expanding cones to provide discharge air paths which shall be, minimally, two-position adjustable for horizontal or vertical discharge.

[Finish shall be baked enamel.]

[Antismudge ring shall be provided.]

2.2.5 Type DRH

Type DRH supply diffuser shall be half-round with [four] [_____] semiconical expanding members to discharge diffused air in a 180-degree pattern. Cones shall be arranged to provide a minimum of [three] [_____] air paths which shall simultaneously diffuse air at 6 to 15 meter per minute 20 to 50 fpm. Opposed-blade volume control shall be provided.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.6 Type DP Series

Type DP series supply diffuser shall have a [square] [rectangular], perforated, hinged, face plate with [opposed blade] [splitter-damper] volume control, white baked enamel exterior finish, and black matte finish on exposed-to-view interior surface.

[Type DPA shall provide one-way deflection.]

[Type DPB shall provide two-way opposed deflection.]

[Type DPC shall provide two-way diagonal deflection.]

[Type DPD shall provide three-way deflection.]

[Type DPE shall provide four-way deflection.]

2.2.7 Type DLB

Type DLB supply diffuser shall be linear bar type, frame mounted, with extruded-aluminum bar and frame.

Bars shall be [6] [1/4] [_____] millimeter [_____] inch thick by [19] [3/4] [_____] millimeter [_____] inchhigh, [13] [1/2] [_____] millimeter [_____]inch on center. Bar spacing shall be pencilproof. Bar deflection angle shall be zero degrees.

Floor- and sill-mounted diffusers shall be heavy-duty reinforced

construction to carry loads of not less than [490] [100] [_____] kilogram per square meter [_____] pounds per square foot.

Diffusers shall be continuous length with hairline butt joints.

Mitered end caps shall be provided where diffuser run terminates.

Dampers shall be opposed-blade type.

An integral, pivoted, bar-type access door shall be provided where indicated.

Straightening grids shall be provided where indicated.

2.2.8 Type DLS

Type DLS supply diffuser shall be linear slot type, extruded aluminum construction, with fully adjustable integral air pattern and volume control vanes that deflect air pattern from horizontal along ceiling to straight down, or any intermediate setting. Pattern control element shall permit complete blanking-off of slot.

Slot width shall be [19] [3/4] [_____] millimeter [_____] inch.

Number of slots per unit run shall be as indicated.

Butts in continuous runs shall be aligned for hairline joints.

Ends of diffuser shall butt against walls without mitered end caps. End caps shall be provided where slot terminates.

Exposed-to-view part of frame shall be anodized aluminum, and all interior exposed-to-view components shall have a black matte finish.

2.2.9 Type DSA

Type DSA supply diffuser shall be square with [four] [_____] expanding flared members to provide radially diffused discharge air. Flared members shall be arranged to provide a minimum of four air paths which simultaneously diffuse air at 6 to 15 meter per minute 20 to 50 fpm. Pattern adjustments shall include horizontal, vertical projection, and an intermediate position or range.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

[Antismudge ring shall be provided.]

[Integral extended surface to fit into module of lay-in ceiling shall be provided.]

2.2.10 Type GS

Type GS supply grille shall be double deflection type with adjustable face bars parallel to short dimension and adjustable rear bars parallel to long dimension.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

[Integral extended surface to fit into module of lay-in ceiling shall be provided.]

2.2.11 Type GR

Type GR return grilles shall be single deflection type with fixed face bars.

Grilles installed in vertical surfaces shall have horizontal face bars set downward at 35 degrees from vertical.

Grilles installed in horizontal surfaces shall have face bars straight and parallel to short dimension.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

[Integral extended surface to fit into module of lay-in ceiling shall be provided.]

2.2.12 Type GCA

Type GCA shall have an individually adjustable, horizontal, curved-blade grille and a one-way pattern.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.13 Type GCB

Type GCB shall have an individually adjustable, vertical, curved-blade grille and a one-way pattern.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.14 Type GCD

Type GCD shall have an individually adjustable, vertical, curved-blade grille and a two-way pattern.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.15 Type GCE

Type GCE shall have an individually adjustable, vertical and horizontal, curved-blade grille and a three-way pattern.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.16 Type GCF

Type GCF shall have an individually adjustable, vertical and horizontal, curved-blade grille and a four-way pattern.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.17 Type RS

Type RS shall be supply register, double-deflection type, with adjustable face bars parallel to short dimension and adjustable rear bars parallel to long dimension. Dampers shall be opposed-blade type.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

[Integral extended surface to fit into module of lay-in ceiling shall be provided.]

2.2.18 Type RR

Type RR shall be return register, single-deflection type, and shall have fixed face bars with opposed-blade dampers.

Registers installed in vertical surfaces shall have horizontal face bars set downward at approximately 35 degrees from vertical.

Registers installed in horizontal surfaces shall have face bars set straight and parallel to short dimension.

[Finish shall be baked enamel.]

2.2.19 Type RCA

Type RCA shall have an individually adjustable, horizontal, curved-blade register and a one-way pattern with opposed-blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.20 Type RCB

Type RCB shall have individually adjustable, vertical, curved-blade register and a one-way pattern with opposed blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.21 Type RCC

Type RCC shall have an individually adjustable, horizontal, curved-blade register and a two-way pattern with opposed blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.22 Type RCD

Type RCD shall have an individually adjustable, vertical, curved-blade register and a two-way pattern with opposed blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.23 Type RCE

Type RCE shall have an individually adjustable, vertical and horizontal, curved-blade register and a three-way pattern with opposed-blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.24 Type RCF

Type RCF shall have an individually adjustable, vertical and horizontal, curved-blade register and a four-way pattern with opposed-blade damper.

[Finish shall be baked enamel.]

[Construction shall be aluminum.]

2.2.25 Type TS

Type TS supply troffer complete assembly shall be provided as specified in Section 16511S FLUORESCENT LUMINAIRES and as indicated. Air handling section of unit shall be installed under this section.

2.2.26 Type TR

Type TR return troffer shall conform to requirements for Type TS supply troffer.

2.2.27 Type TSR

Type TSR combination supply and return troffer assembly shall be provided as specified in Section 16511S FLUORESCENT LUMINAIRES and as indicated. Air handling section of unit shall be installed under this section.

PART 3 EXECUTION

3.1 INSTALLATION

Equipment shall be installed as indicated and specified and in accordance with manufacturer's recommendations.

[Wall-mounted supply registers shall be mounted 150 millimeter 6 inches below ceiling.]

[Wall-mounted return registers shall be mounted 150 millimeter 6 inches above the finished floor.]

Installation Drawings shall be submitted for air-diffusion devices. Drawings shall indicate overall physical features, dimensions, ratings, service requirements, and equipment weights.

-- End of Section --