LE 4

Recessed Luminaires, Ceiling Compatibility

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NEMA Standards Publication LE 4-2001

Recessed Luminaires, Ceiling Compatibility

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Foreword

The purpose of this standards publication is to establish standardized dimensions for recessed luminaires that, if adhered to, will ensure compatibility with conventional generic ceiling suspension systems. Compatibility, as referred to in this standards publication, means that luminaires will be designed to fit into ceiling systems without causing distortion or misalignment of ceiling members and in such a manner as to ensure their proper support within the ceiling in accordance with the *National Electrical Code*. Compatibility further means that a luminaire will be placed in support systems in a symmetrical manner without oversized gaps existing between the luminaire and ceiling tiles or ceiling suspension members.

It is not the intent of this standards publication to inhibit luminaire design or to impose arbitrary tolerances on any luminaire manufacturer.

This standards publication does not attempt to establish comprehensive ceiling grid system standards; other sizes and designs of ceiling systems may be used. However, NEMA-type luminaires may not be compatible with these non-defined systems.

In the preparation of this standards publication, input of users and other interested parties has been sought and evaluated. Inquiries, comments, and proposed or recommended revisions should be submitted to the Indoor Lighting Equipment Subdivision of NEMA by contacting:

Vice-President, Engineering
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This standard was developed by the Luminaire Section to supersede and replace the original NEMA LE 1-1974 and later NEMA LE 4-1987. Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Luminaire Section was comprised of the following members:

American Electric Lighting
Cooper Lighting Group
EGS Electrical Group
GE Lighting Systems
Genlyte Thomas Group
Hubbell, Incorporated
Holophane Corporation
Indy Lighting, Incorporated
Juno Lighting, Incorporated
Lighting Corporation of America
Lithonia Lighting Group
Red Dot Division, L.E. Mason
Simkar Corporation
Steel Craft Industries
The Jones Metal Products Company

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Section 1
GENERAL

1.1 SCOPE

This standards publication contains definitions, dimensions, and tolerances for recessed luminaires designed to use fluorescent, high-intensity discharge, and incandescent light sources.

Drawing examples show fluorescent lamps. However, these drawings also apply to high intensity discharge, compact fluorescent, incandescent, and other lamp sources.

This standard does not apply to “hard metric dimensioned” products. However, “soft metric dimensions” or direct metric conversions may be applied throughout this standard as one inch equals 25.4 millimeters.

1.2 DEFINITIONS

ceiling suspension system: The entire network or grid of structural components that provide support for acoustical ceiling tiles, acoustical ceiling panels, luminaires, and air handling terminals.

recessed luminaire: A luminaire that is mounted above the ceiling (or behind a wall or other surface) with the opening of the luminaire essentially level with the surface.

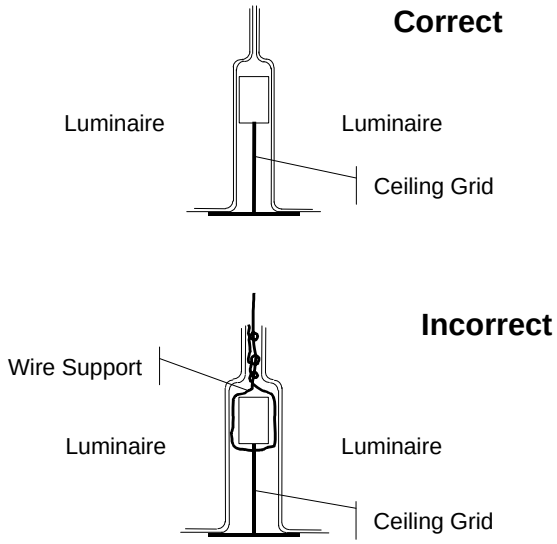
splay: Decorative trim of various materials provided by ceiling manufacturers, used to conceal edges of the tile and supporting member.

1.3 SUPPORT WIRES

There shall be no ceiling grid support wires between recessed luminaire ends where the luminaires are mounted in continuous rows. See Figure 1-1.

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Cross Section of End
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Figure 1-1
LUMINAIRES MOUNTED IN CONTINUOUS ROWS

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Section 2
TYPES OF RECESSED FLUORESCENT LUMINAIRES

2.1 GENERAL INFORMATION

All maximum dimensions shown for ceiling grid systems in Section 2 are stipulated for purposes of defining which systems NEMA-type recessed luminaires will fit into. Except where maximum or minimum dimensions are shown, all dimensions are nominal.

The manufacturing methods and processes required to produce recessed luminaires are such that they preclude precise dimensional tolerances; therefore, a slight bow or variation in overall dimensions is to be expected.

2.2 TYPE F (FLANGED)

A Type F luminaire, as shown in Figure 2-1, is one having flanges which conceal the edges of the ceiling opening. The luminaire is mounted with integral adjustable supports. All luminaire dimensions are in inches and NW (nominal width), NL (nominal length), and H (support height) must be coordinated.

In Figure 2- 1:

NL	=	Nominal ceiling opening length
W	=	Nominal ceiling opening width
FW	=	Luminaire flange width, such that it adequately conceals ceiling opening and supporting hardware
FL	=	Luminaire flange length, such that it adequately conceals ceiling opening and supporting hardware
RW	=	Recessed housing width, less than or equal to (NW – 1/16”)
LL	=	Luminaire length, less than or equal to NL
H	=	Support height

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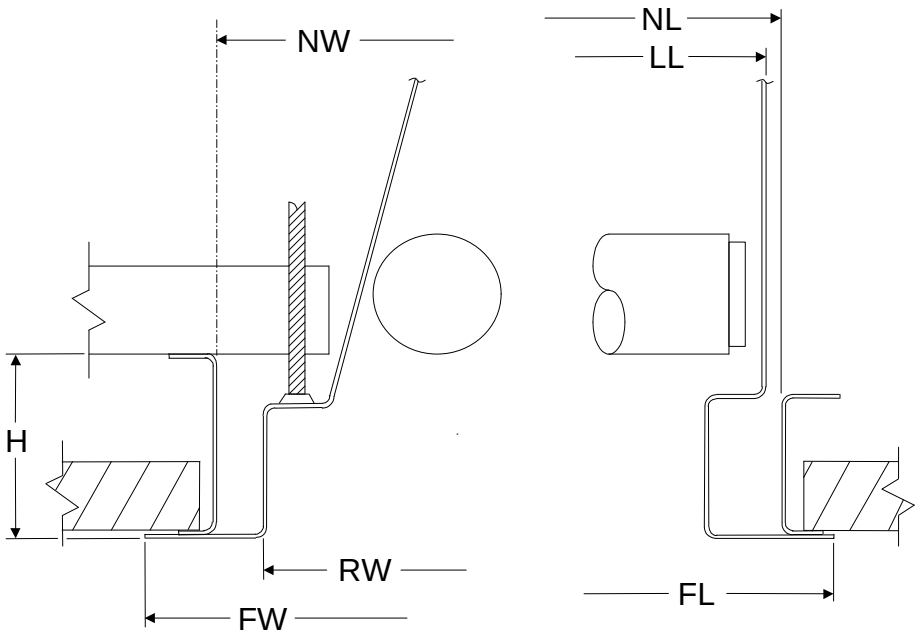


Figure 2-1
TYPE F

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2.3 TYPE M (MODULAR) AND TYPE Z (Z SPLINE)

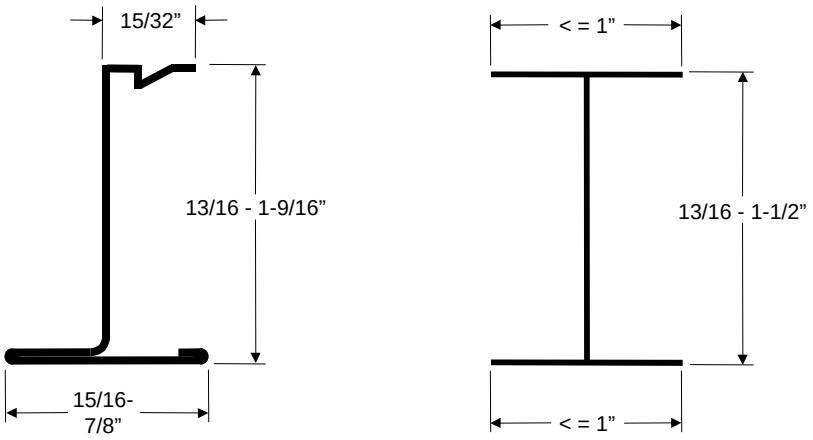
Type M and Z luminaires, as shown in Figures 2-2 and 2-3, have flanges that align with the ceiling openings on all four sides. The luminaire is mounted from integral adjustable hangers or other means of support. All dimensions are in inches and include out-of-square tolerances. W (modular width), L (modular length), and H (support height) must be coordinated.

In Figure 2-2:

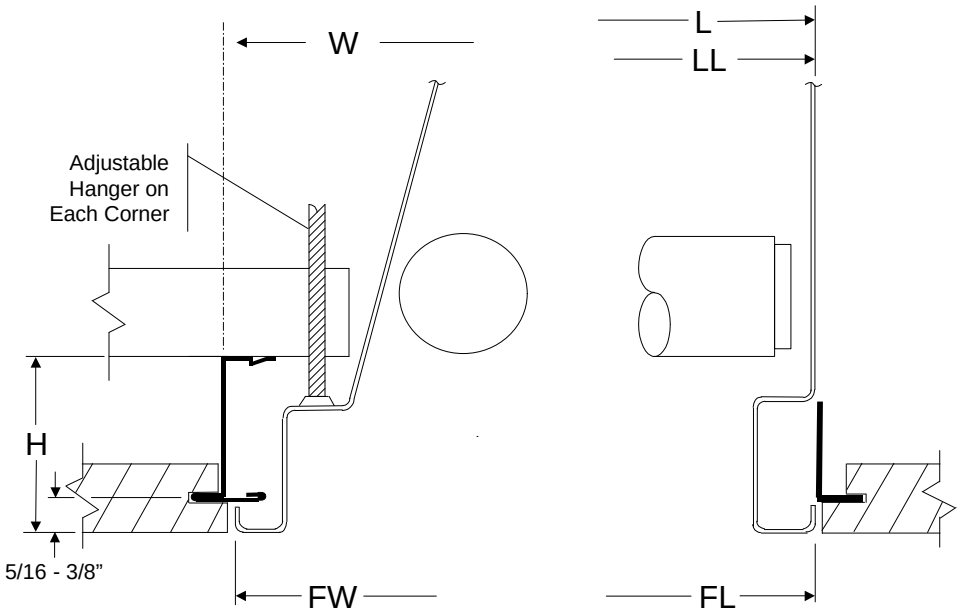
L	=	Modular length dimensions
W	=	Modular width dimensions center-to-center of ceiling support members
FW	=	Luminaire flange width, equal to W
FL	=	Luminaire flange length, equal to L
LL	=	Overall luminaire length, less than or equal to L
H	=	Support height

All ceiling dimensions shown in Figure 2-3 and designated with an asterisk (*) must be coordinated. All snap bars must run parallel to fixture length.

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“Z” Spline “H” Spline

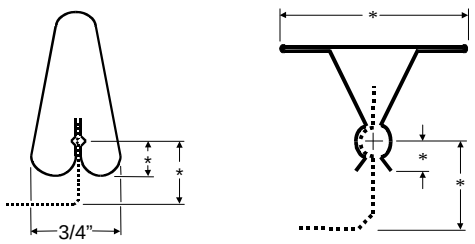


Cross Section of Side Cross Section of End

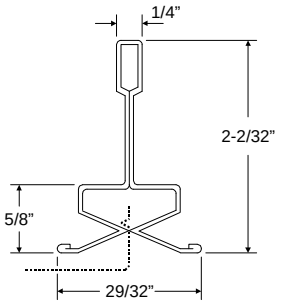
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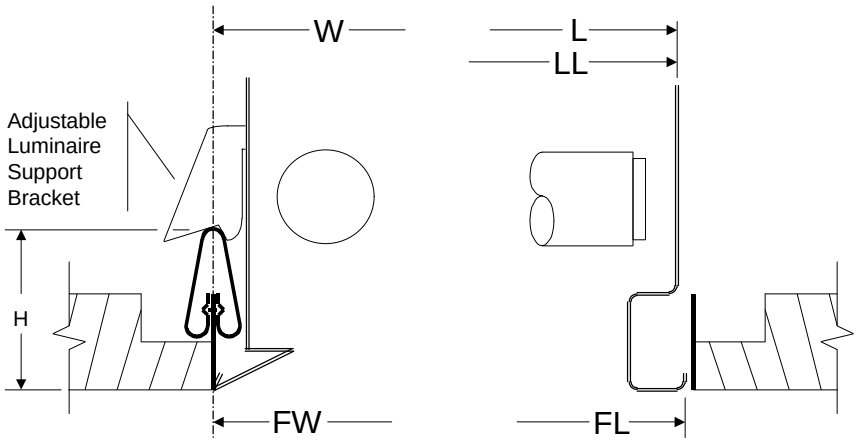
Figure 2-2
TYPE M AND TYPE Z
(SPLINE)

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Snap-in Snap-in Bar





Cross Section of Side Cross Section of End

Not to Scale

Figure 2-3
TYPE M AND TYPE Z
(SNAP-IN)

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2.4 TYPE G (GRID)

A Type G luminaire, as shown in Figure 2-4, is one having edges which rest on, and are supported by, exposed inverted tees configured in a grid pattern. If T-bar clips are integral with, or are furnished with, the luminaire, they shall be field-secured to the inverted ceiling tees. All dimensions are in inches and include out-of-square tolerance.

In Figure 2-4:

L	=	Modular length dimension center-to-center of T-bar
W	=	Modular width dimension center-to-center of T-bar
EL	=	Luminaire edge length, equal to (L – ¼"). A plus (+) tolerance of 3/32 inch on edge length (EL) is permitted only if edge width (EW) does not exceed (W - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
EW	=	Luminaire edge width, equal to (W – ¼"). A plus (+) tolerance of 1/8 inch on edge with (EW) is permitted only if edge length (EL) does not exceed (L – ¼"). A minus (-) tolerance of 1/8 inch is permitted.
LL	=	Over-all luminaire length, less than or equal to L
ID-OD	=	Inside dimension-outside dimension

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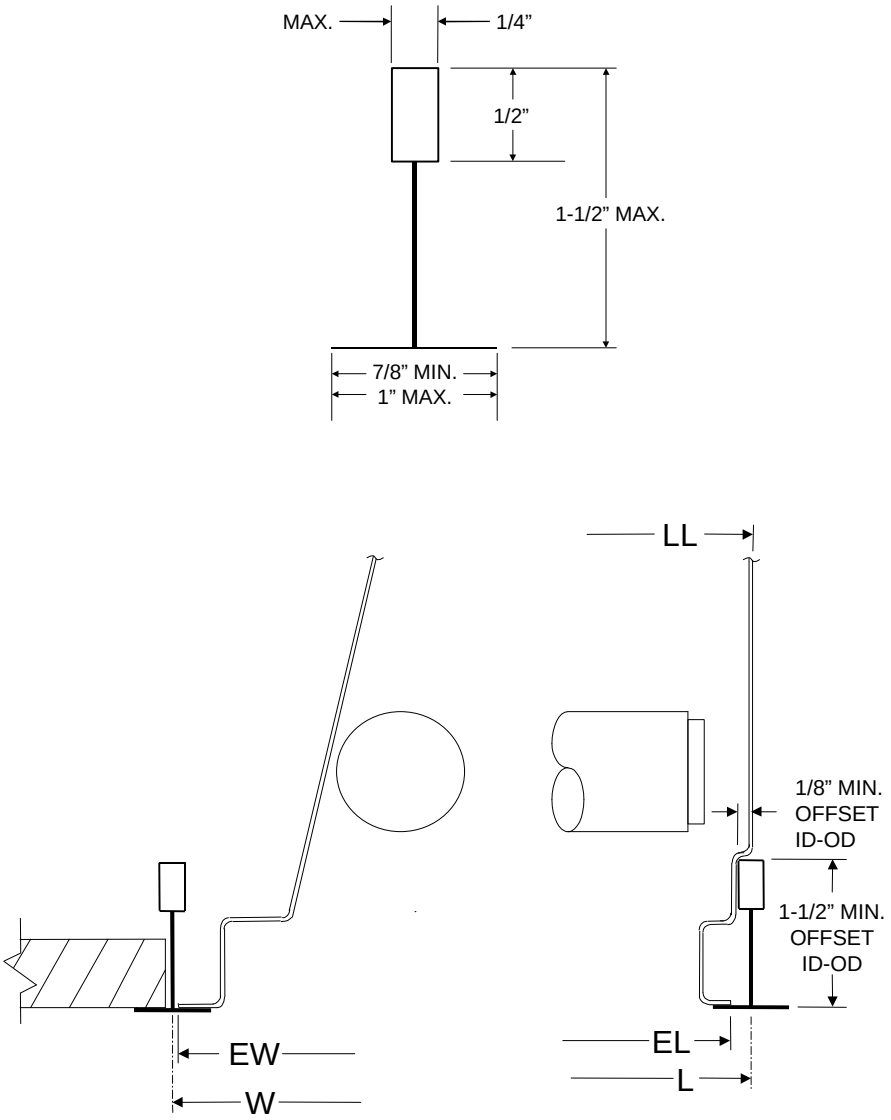


Figure 2-4
TYPE G

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2.5 TYPE GR (GRID-REGRESSED)

A Type GR luminaire, as shown in Figure 2-5, is the same as a Type G luminaire, except the edges of the luminaire rest on, and are supported by, concealed inverted tees configured in a grid pattern. If T-bar clips are integral with, or are furnished with the luminaire, they shall be field-secured to the inverted ceiling tees.

A separate regressed splay frame may be used to conceal the edges of the tile and supporting member.

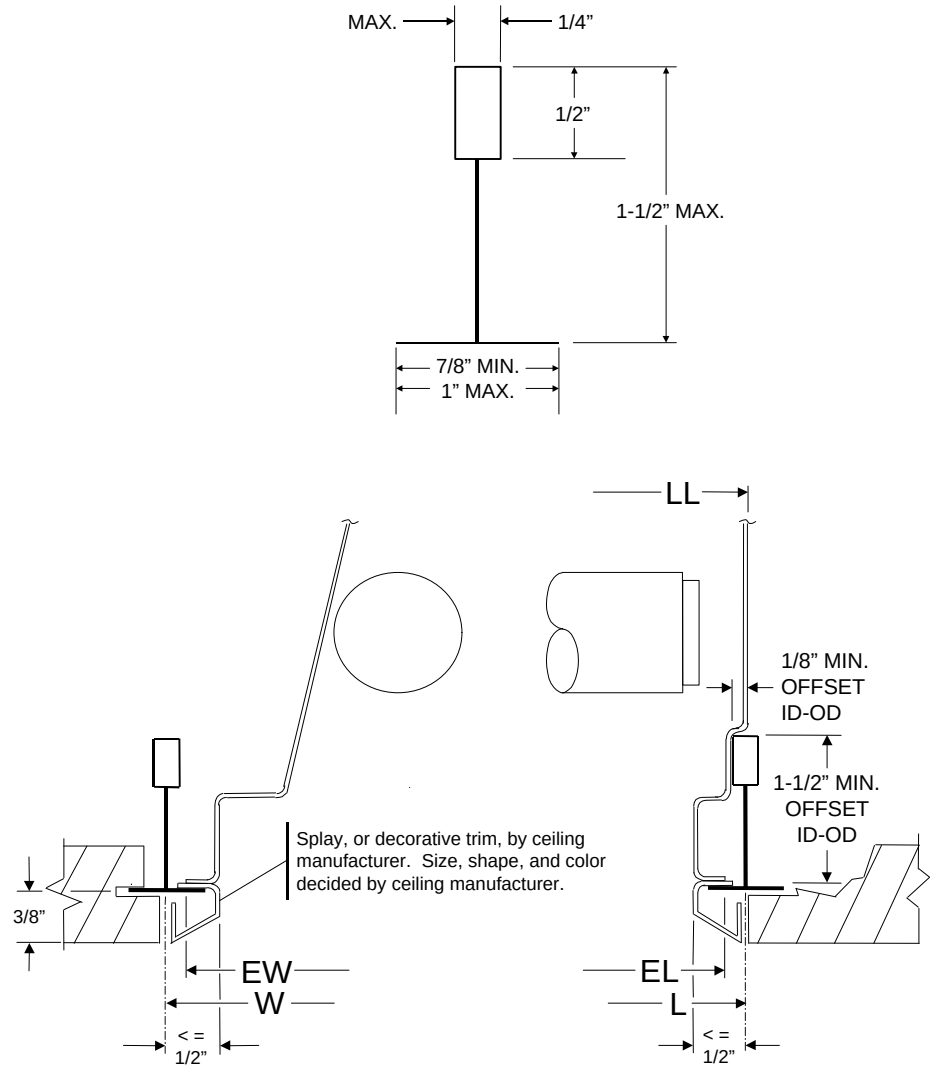
All dimensions are in inches and include out-of-square tolerance.

In Figure 2-5:

L	=	Modular length dimension center-to-center T-bar
W	=	Modular width dimension center-to-center T-bar
EL	=	Luminaire edge length, equal to (L - ¼"). A plus (+) tolerance of 3/32 inch on each length (EL) is permitted only if edge width (EW) does not exceed (W - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
EW	=	Luminaire edge width, equal to (W - ¼"). A plus (+) tolerance of 1/8 inch on edge width (EW) is permitted only if edge length (EL) does not exceed (L - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
LL	=	Over-all luminaire length, less than or equal to L
ID-0D	=	Inside dimension - outside dimension

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Cross Section of Side

Cross Section of End

Not to scale

Figure 2-5
TYPE GR

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2.6 TYPE NFG (NARROW FACED GRID)

A Type NFG luminaire, as shown in Figure 2-6, is similar to a Type G luminaire, having edges which rest on, and are supported by, exposed inverted tees configured in a grid pattern. T-bar clips integral with, or furnished with, the luminaire shall be field-secured to the inverted ceiling tees, and the luminaire shall be centered within the opening. All dimensions are in inches, and maximum dimensions include out-of-square tolerance.

In Figure 2-6:

L	=	Modular length dimension center-to-center T-bar
W	=	Modular width dimension center-to-center T-bar
EL	=	Luminaire edge length, equal to (L – ¼"). A plus (+) toleranceof 3/32 inch on edge length (EL) is permitted only if edge width (EW) does not exceed (W - ¼"). A minus tolerance of 1/8 inch is permitted.
EW	=	Luminaire edge width, equal to (W - ¼"). A plus (+) tolerance of 1/8 inch on edge width (EW) is permitted only if edge length (EL) does not exceed (L - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
LL	=	Over-all luminaire length, less than or equal to L
ID-OD	=	Inside dimension-outside dimension

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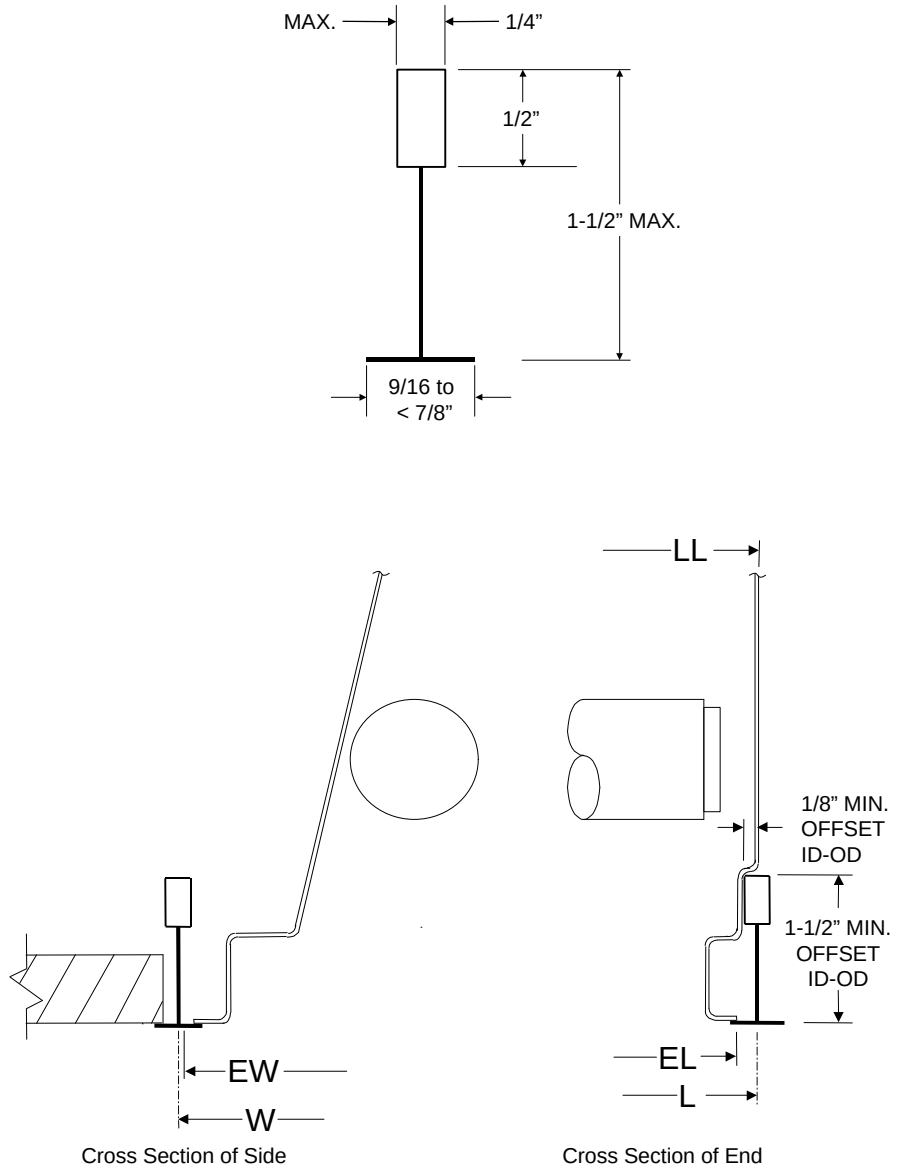


Figure 2-6
TYPE NFG

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2.7 NFSG (NARROW FACED SLOT GRID)

A Type NFSG luminaire, as shown in Figure 2-7, is similar to Type G luminaire, having edges which rest on, and are supported by, exposed tees configured in a grid pattern.

Additional luminaire support may be provided using support means furnished by the installer.

T-bar clips integral with, or furnished with, the luminaire shall be field-secured to the inverted ceiling tees, and the luminaire shall be centered within the opening. All dimensions are in inches, and maximum dimensions include out-of-square tolerance.

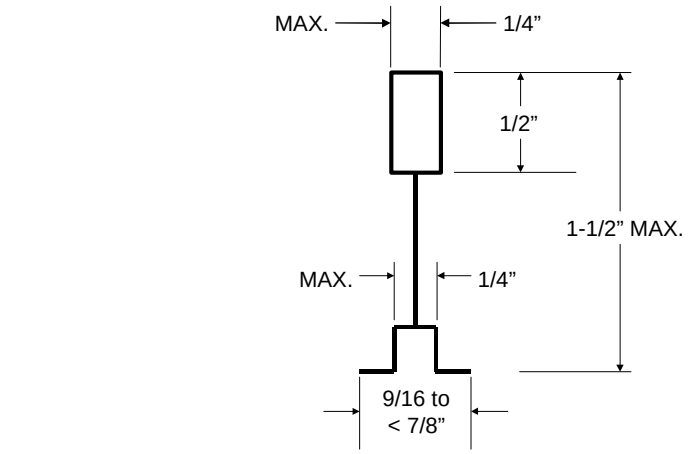
In Figure 2-7:

L	=	Modular length dimension center-to-center of T-bar
W	=	Modular width dimension center-to-center of T-bar
EL	=	Luminaire edge length, equal to (L - ¼"). A plus(+) tolerance of 00 inch on edge length (EL) is permitted. A minus (-) tolerance of 1/8 inch is permitted.
EW	=	Luminaire edge width, equal to (W - ¼"). A plus (+) tolerance of 00 inch on edge width (EW) is permitted. A minus (-) tolerance of 1/8 inch is permitted.
LL	=	Over-all luminaire length, less than or equal to L

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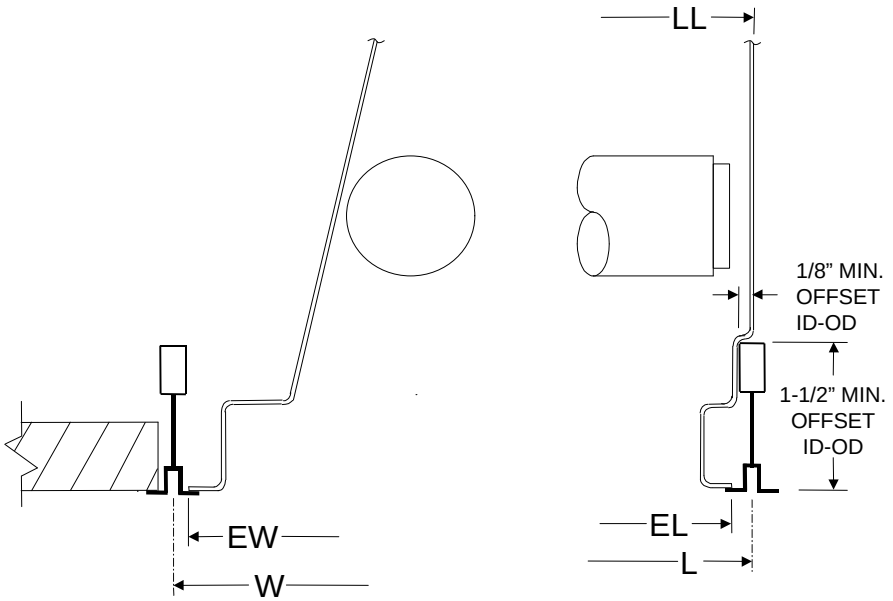


Figure 2-7
TYPE NFSG

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2.8 TYPE SS (SCREW SLOT)

A Type SS luminaire, as shown in Figures 2-8 and 2-9, is one having edges which rest on, and are supported by, exposed inverted tees configured in a grid pattern. T-bar clips integral with, or furnished with, the luminaire shall be field-secured to the inverted ceiling tees, and the luminaire shall be centered within the opening. All dimensions are in inches, and maximum dimensions include out-of-square tolerance.

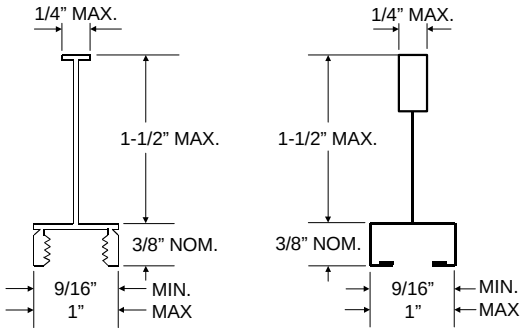
In Figures 2-8:

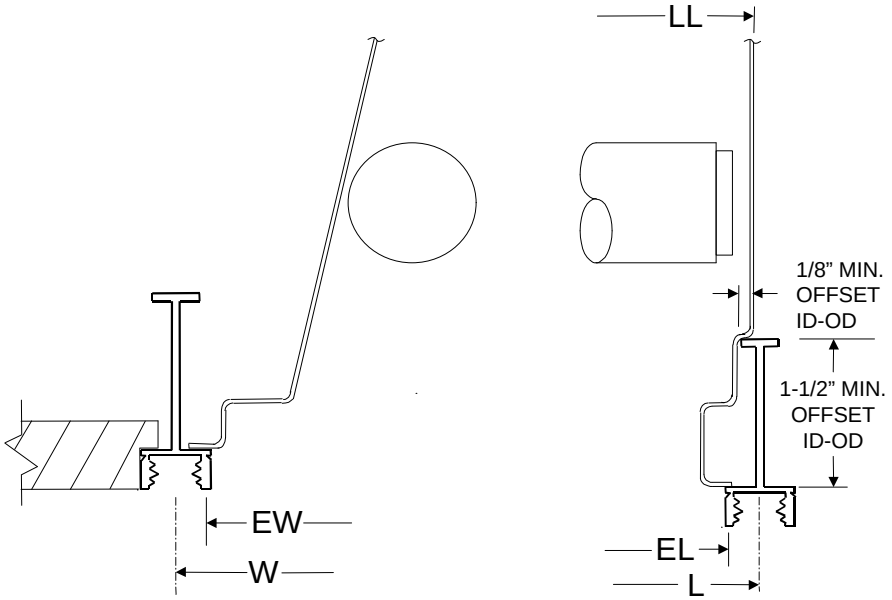
L	=	Modular length dimensions center-to-center of T-bar
W	=	Modular width dimension center-to-center of T-bar
EL	=	Luminaire edge length, equal to (L – ¼"). A plus (+) tolerance of 3/32 inch on edge length (EL) is permitted only if edge width (EW) does not exceed (W - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
EW	=	Luminaire edge width, equal to (W - ¼"). A plus (+) tolerance of 1/8inch on edge width (EW) is permitted only if edge length (EL) does not exceed (L - ¼"). A minus (-) tolerance of 1/8 inch is permitted.
LL	=	Over-all length, less than or equal to L
ID-OD	=	Inside dimension-outside dimension

All dimensions shown in Figure 2-8 apply to Figure 2-9.

Figure 2-10, Type SS-Special, shows a sample of a type of ceiling design that requires special luminaire construction.

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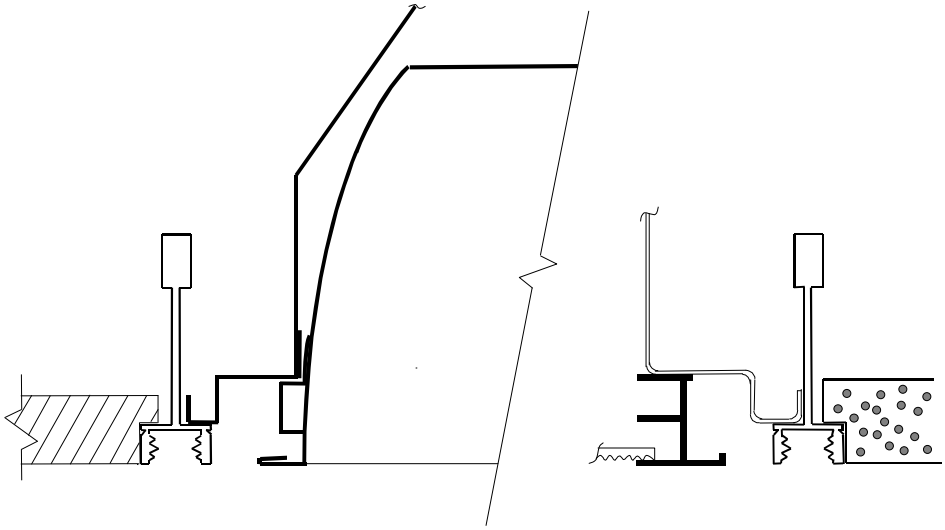
Cross Section of Side

Cross Section of End

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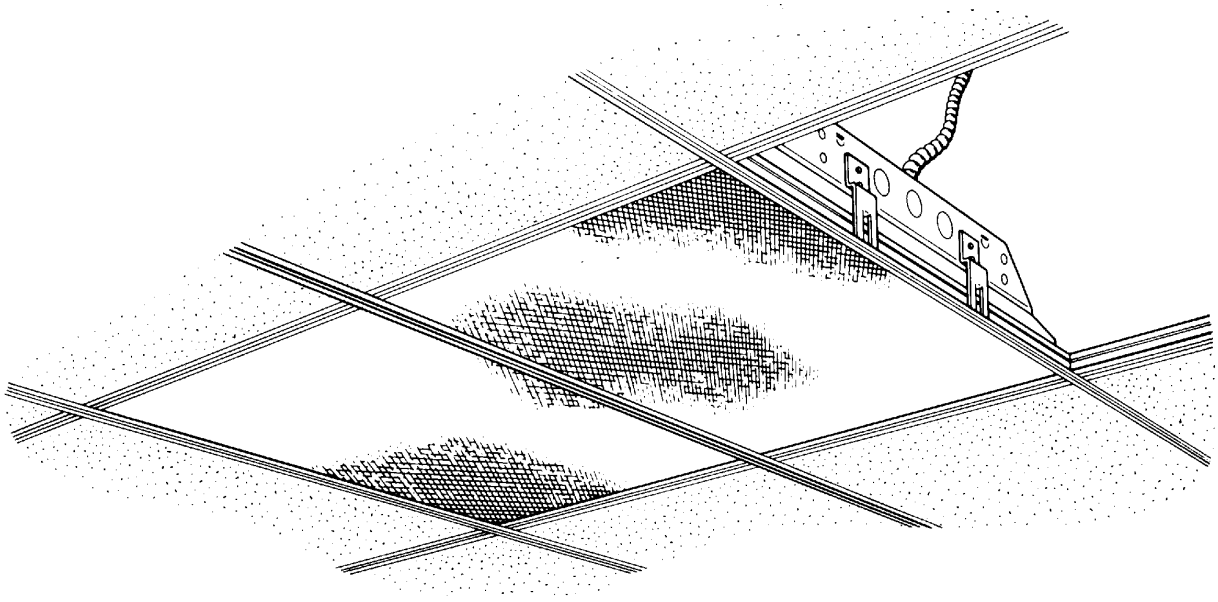
Figure 2-8
TYPE SS

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Not to scale

Figure 2-9
TYPE SS



CAUTION: Special luminaire construction is required for ceiling designs where screw slot t-bar divides luminaire length in half requiring double doors.

Figure 2-10
TYPE SS—SPECIAL

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