HPC-ASI-LMC – SERIES
LAB MEDIA CEILING GRID SYSTEMS

HEPAire Products (1986) Corporation

Engineering Technical Submittal Package

Client:
Attention:
Project Managers:
Project:
Tender Package:
Specification Section:
132616 Modular Laboratory Rooms
HEPAire Project Number:
Date: 04/17/2023

COMBINDED ENGINEERING SOLUTIONS – ONE CREATIVE VISION

Web: www.hepaireproducts.com

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HPC-ASI-LMC – SERIES
LAB MEDIA CEILING GRID SYSTEMS
ENGINEERING TECHNICAL SUBMITTIAL PACKAGE

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HPC-ASI-LMC – SERIES
LAB MEDIA CEILING GRID SYSTEMS

HEPAire Products Corporation recently introduced the HPC-ASI-LMC Series Laboratory Media Ceilings and **"UNIMODULE"** service island modules to assist in the ever-changing laboratory design space utilization needs to create the next generation of social adaptable open design laboratories which can foster team-based research interaction while providing a system design balance of flexibility, ease of expansion and equipment placement, with a forum of pre-engineered standard design elements for integration of todays advanced technologies.

The following presentation will provide insight into the unique ultra clean ceiling and wall system design integration which now provides laboratory research facilities an alternative to conventional laboratory design methodology.

HEPAire Products (1986) Corporation

Michael B. Mennie

Michael B. Mennie – C.E.T.

President

HEPAire Products (1986) Corporation

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS

ENGINEERING TECHNICAL PRODUCT INFORMATION

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS COMPONENTS

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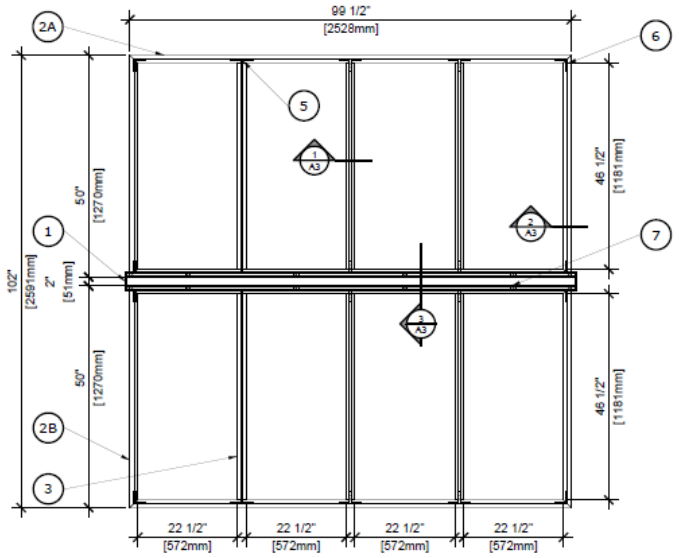
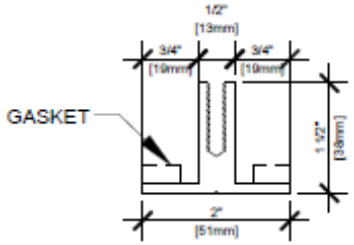
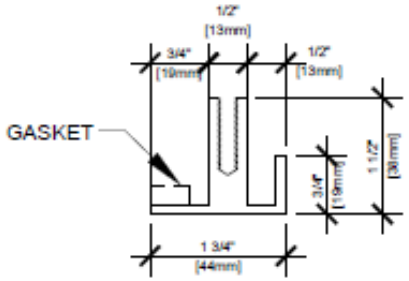
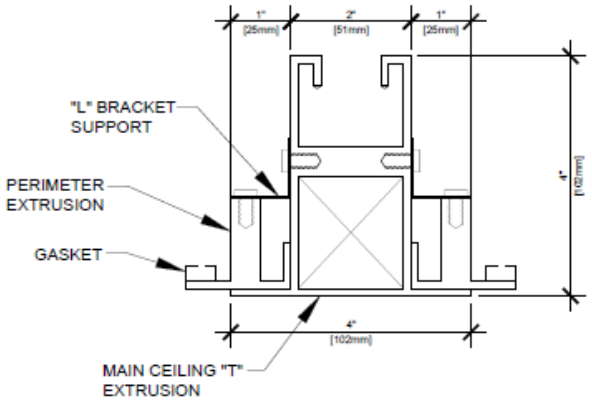




1 A3 CROSS "T" SUPPORT
PART # C-CD16

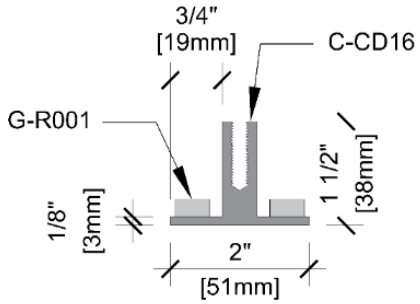


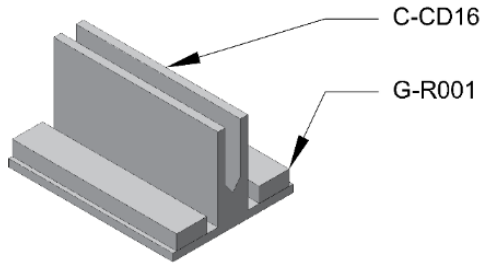
2 A3 PERIMETER EXTRUSION
PART # C-PS13



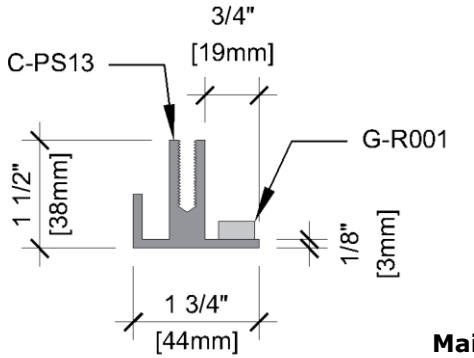
3 A3 MAIN SUPPORT "T" / LADDER CONNECTION
PART # C-MS14

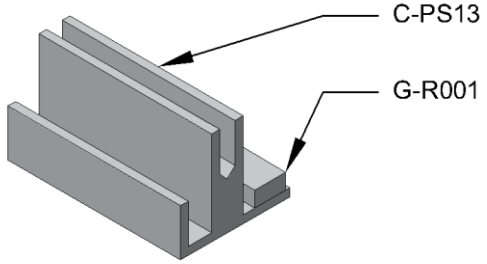
Cross "T" Grid - Part # C-CD16



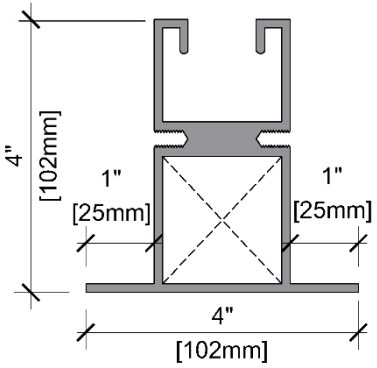


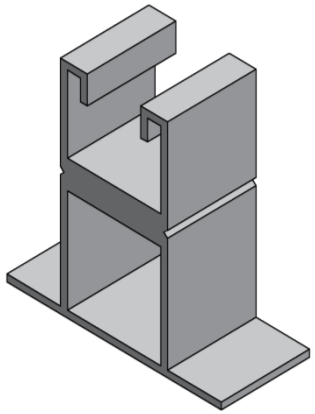
Perimeter "L" Grid Part # C-PS13





Main support "T" Grid Part # C-MS14





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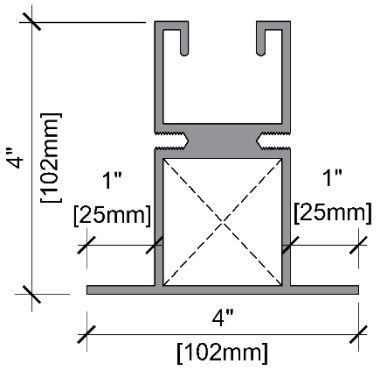
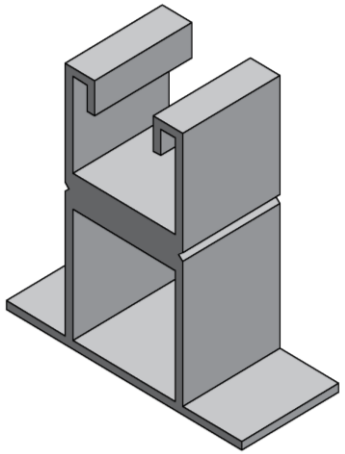
HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - COMPONENTS

Technical Information – Main Structural Support "T" Framing





Typical Framing Support based on 10'-0" x 5'-0" modulation. We can offer in smaller modulation for increased point loading.

Main Support T - 10' Segment

System DL = 1.50 psf

Interior Pressure = 0 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.40	14	Deflection
L/400	0.30	10	Deflection
L/500	0.24	7	Deflection
L/600	0.20	6	Deflection
L/700	0.17	5	Deflection
L/800	0.15	4	Deflection

Interior Pressure = 5.22 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.40	9	Deflection
L/400	0.30	5	Deflection
L/500	0.24	2	Deflection
L/600	0.20	1	Deflection
L/700	0.17	0	Deflection

Main Support T - 6' Segment*

System DL = 1.50 psf

Interior Pressure = 0 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.24	17 (71)	Deflection
L/400	0.18	12 (53)	Deflection
L/500	0.14	10 (42)	Deflection
L/600	0.12	8 (34)	Deflection
L/700	0.10	7 (29)	Deflection
L/800	0.09	6 (25)	Deflection

Interior Pressure = 5.22 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.24	12 (66)	Deflection
L/400	0.18	7 (47)	Deflection
L/500	0.14	4 (36)	Deflection
L/600	0.12	3 (29)	Deflection
L/700	0.10	1 (24)	Deflection
L/800	0.09	1 (20)	Deflection

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - COMPONENTS

Technical Information – Main Cross Support "T" Framing

Ceiling T

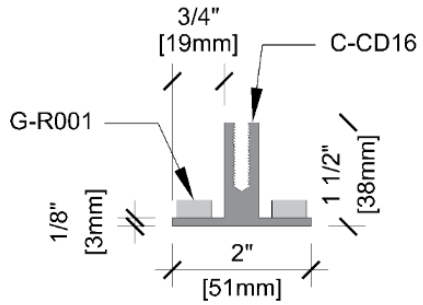
System DL = 0.42 psf

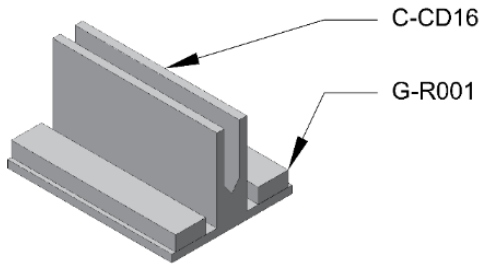
Interior Pressure = 0 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.17	17	Deflection
L/400	0.13	12	Deflection
L/500	0.10	10	Deflection
L/600	0.08	8	Deflection
L/700	0.07	7	Deflection
L/800	0.06	6	Deflection

Interior Pressure = 5.22 psf

Deflection Limit	Deflection (in)	Max Superimposed Dead Load (psf)	Governing Capacity
L/300	0.17	12	Deflection
L/400	0.13	7	Deflection
L/500	0.10	4	Deflection
L/600	0.08	3	Deflection
L/700	0.07	1	Deflection
L/800	0.06	1	Deflection

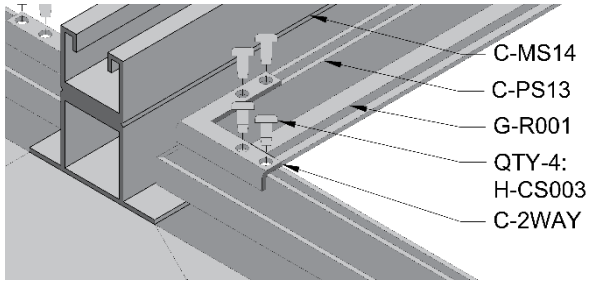


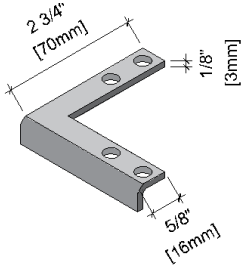


Typical Framing Support based on 10'-0" x 5'-0" modulation. We can offer in smaller modulation for increased point loading.

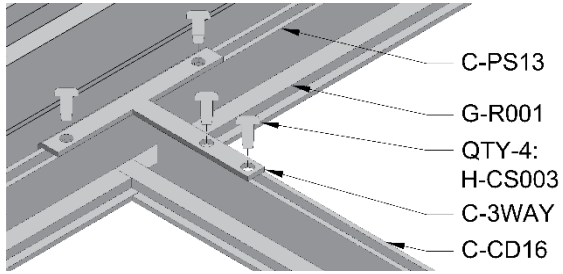
HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - CONNECTORS

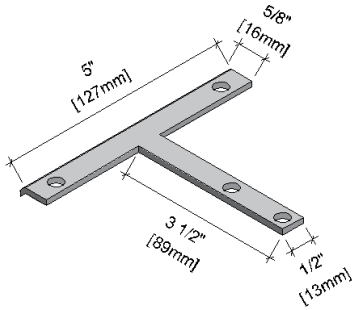
2-way corner connector Part # C-2WAY



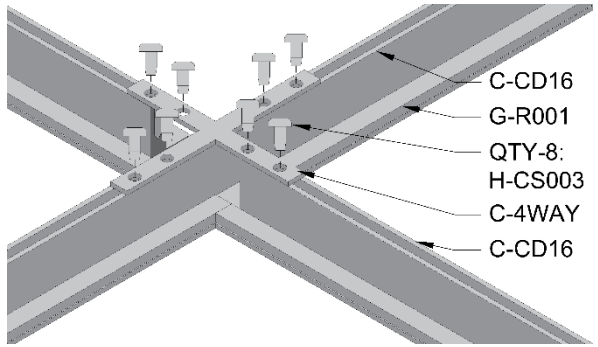


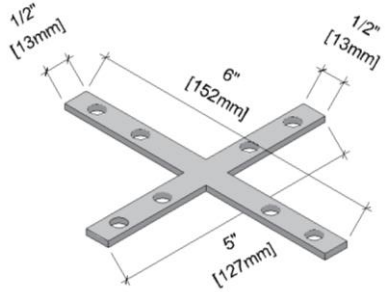
3-way connector Part # C-3WAY



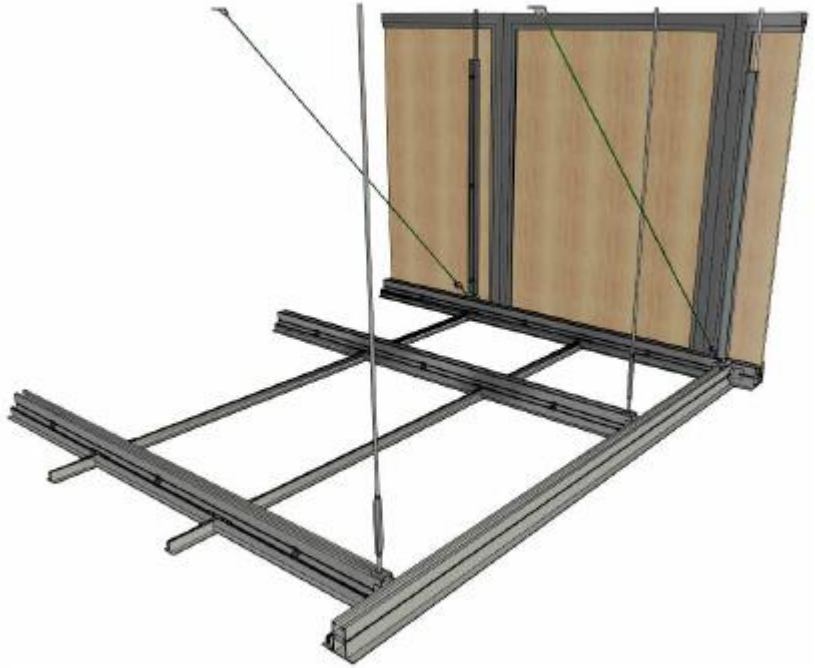


4-way connector Part # C-4WAY





HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application



Channel Nut Size-Thread	Gauge	Allowable Pull-Out Strength Lbs *(kN)*	Resistance to Slip Lbs *(kN)*	Torque Ft-Lbs *(N•m)*
½" - 13	14	1,400 *6.23*	1,000 *4.45*	50 *70*
⅜" - 16	14	1,000 *4.45*	750 *3.34*	19 *25*

Typical Suspended Kit hardware package. Kit includes a standard 12” long 3/8”diameter threaded rod with spring nut compression strut and slip on locking nut washer which is then attached to our top notch lock on main framing member with turnbuckle termination on other end for attachment to building structure. Length of final threaded rod connection and anchor or beam selection to be site specific determined.

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - ANCHORS

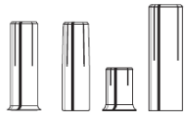
Technical Information – Structural Support Suspended Application

HEPAire Products (1986) Corporation

RED HEAD CONCRETE ANCHORING SPECIALISTS

Submittal Information

Multi-Set II®



SPECIFIED FOR ANCHORAGE INTO CONCRETE

Drop-In, shell-type anchors feature an internally threaded, all-steel shell with expansion cone insert and flush embedment lip. "Anchors are manufactured from zinc-plated carbon steel, 18-8 stainless steel and 316 stainless steel.

Anchors should be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994 specifications.

Anchors should be tested to ASTM E488 criteria and listed by ICC (formerly ICBO). Anchors should also be listed by the following agencies as required by the local building code: UL, FM, City of Los Angeles, California State Fire Marshal and Cal Trans.

APPROVALS/LISTINGS

Meets or exceeds U.S. Government G.S.A. Specification A-A-55614 Type 1 (Formerly GSA: FF-S-325 Group VIII)

Underwriters Laboratories

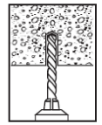
Factory Mutual

California State Fire Marshal

Caltrans

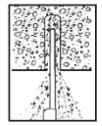
For the most current approvals/listings visit: www.itw-redhead.com

INSTALLATION STEPS



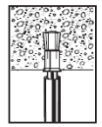
To set anchor flush with surface:

1. Drill hole to required embedment (see Table on page 73).



2. Clean hole with pressurized air.

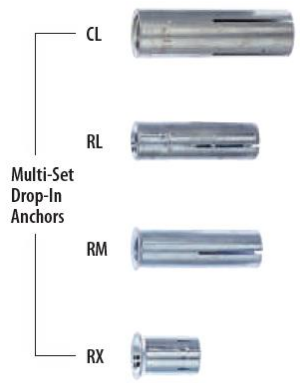
3. Drive anchor flush with surface of concrete.



4. Expand anchor with setting tool provided (see chart). Anchor is properly expanded when shoulder of setting tool is flush with top of anchor.

To set anchor below surface:

Drill hole deeper than anchor length. Thread bolt into anchor. Hammer anchor into hole until bolt head is at desired depth. Remove bolt and set anchor with setting tool.



PERFORMANCE TABLE

Multi-Set II Drop-In Anchors — *Ultimate Tension and Shear Values (Lbs/kN) in Concrete**

BOLT DIA. In. (mm)	ANCHOR DIA. In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	TENSION Lbs. (kN) f'c = 2000 PSI (13.8 MPa)	TENSION Lbs. (kN) f'c = 4000 PSI (27.6 MPa)	TENSION Lbs. (kN) f'c = 6000 PSI (41.4 MPa)	SHEAR Lbs. (kN) f'c ≥2000 PSI (13.8 MPa)
1/4 (6.4)	3/8 (9.5)	1 (25.4)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1,680 (7.5)	2,260 (10.5)	2,080 (13.3)	1,080 (4.8)
3/8 (9.5)	1/2 (12.7)	1-5/8 (41.3)		2,980 (13.3)	3,800 (16.9)	6,240 (27.8)	3,160 (14.1)
1/2 (12.7)	5/8 (15.9)	2 (50.8)		3,360 (14.7)	5,840 (26.0)	8,300 (36.9)	4,580 (20.4)
5/8 (15.9)	7/8 (22.2)	2-1/2 (63.5)		5,500 (24.5)	8,640 (38.4)	11,020 (49.0)	7,440 (33.1)
3/4 (19.1)	1 (25.4)	3-3/16 (81.0)		8,280 (36.8)	9,480 (42.2)	12,260 (54.5)	10,480 (46.6)

*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.
*For continuous extreme low temperature applications, use stainless steel.

Combined Tension and Shear Loading—for Multi-Set Anchors

Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:

$$(Ps/Pt)^{5/3} + (Vs/Vt)^{5/3} \leq 1$$

Ps = Applied tension load Vs = Applied shear load Pt = Allowable tension load Vt = Allowable shear load

RED HEAD CONCRETE ANCHORING SPECIALISTS

Submittal Information

PERFORMANCE TABLES

Multi-Set II Drop-In Anchors — *Ultimate Tension and Shear Values (Lbs/kN) in Lightweight Concrete**

BOLT DIA. In. (mm)	ANCHOR DIA. In. (mm)	MINIMUM EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	LIGHTWEIGHT CONCRETE f'c = 3000 PSI (20.7 MPa) TENSION Lbs. (kN)	LIGHTWEIGHT CONCRETE f'c = 3000 PSI (20.7 MPa) SHEAR Lbs. (kN)	LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL f'c = 3000 PSI (20.7 MPa) TENSION Lbs. (kN)	LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL f'c = 3000 PSI (20.7 MPa) SHEAR Lbs. (kN)
3/8 (9.5)	1/2 (12.7)	1-5/8 (39.7)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	2,035 (9.1)	1,895 (8.4)	3,340 (14.9)	4,420 (19.6)
1/2 (12.7)	5/8 (15.9)	2 (50.8)		2,740 (12.2)	2,750 (12.2)	3,200 (14.2)	4,940 (22.0)
5/8 (15.9)	7/8 (22.2)	2-1/2 (63.5)		4,240 (18.9)	4,465 (19.9)	5,960 (26.5)	5,840 (26.0)
3/4 (19.1)	1 (25.4)	3-3/16 (81.0)		5,330 (23.7)	6,290 (28.0)	8,180 (36.4)	9,120 (40.6)

*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

Multi-Set II Drop-In Anchors — *Recommended Edge and Spacing Distance Requirements**

BOLT DIA. In. (mm)	DRILL BIT SIZE In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	MIN. EDGE DISTANCE AT WHICH LOAD FACTOR APPLIED =.80 FOR TENSION =.70 FOR SHEAR In. (mm)	SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	MIN. ALLOWABLE SPACING BETWEEN ANCHORS LOAD FACTOR APPLIED =.80 FOR TENSION =.55 FOR SHEAR In. (mm)
1/4 (6.4)	3/8 (9.5)	1 (25.4)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1-3/4 (44.5)	7/8 (22.2)	3-1/2 (88.9)	1-3/4 (44.5)
3/8 (9.5)	1/2 (12.7)	1-5/8 (41.3)		2-7/8 (73.0)	1-7/16 (36.5)	5-11/16 (144.5)	2-7/8 (73.0)
1/2 (12.7)	5/8 (15.9)	2 (50.8)		3-1/2 (88.9)	1-3/4 (44.5)	7 (177.8)	3-1/2 (88.9)
5/8 (15.9)	7/8 (22.2)	2-1/2 (63.5)		4-3/8 (111.1)	2-3/16 (55.6)	8-3/4 (222.3)	4-3/8 (111.1)
3/4 (19.1)	1 (25.4)	3-3/16 (81.0)		5-5/8 (142.9)	2-13/16 (71.4)	11-3/16 (284.2)	5-5/8 (142.9)

*Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

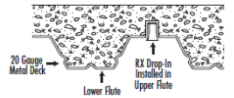
Multi-Set II Drop-In Anchors — *Ultimate Tension and Shear Values (Lbs/kN) for RX-series (3/4" and 1" Embedment)**

BOLT DIA. In. (mm)	DRILL BIT SIZE In. (mm)	EMBEDMENT In. (mm)	2500 PSI (17.2 MPa) CONCRETE TENSION Lbs. (kN)	2500 PSI (17.2 MPa) CONCRETE SHEAR Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE TENSION Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE SHEAR Lbs. (kN)	HOLLOW CORE TENSION Lbs. (kN)	HOLLOW CORE SHEAR Lbs. (kN)
3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	1,571 (7.0)	2,295 (10.2)	1,987 (8.8)	2,903 (12.9)	1,908 (8.5)	2,401 (10.7)
1/2 (12.7)	5/8 (15.9)	1 (25.4)	2,113 (9.4)	2,585 (11.5)	2,673 (11.9)	3,270 (14.5)	2,462 (11.0)	2,401 (10.7)

* The tabulated values are for RX anchors installed at a minimum of 12 diameters on center and minimum edge distance of 6 diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to 6 diameters spacing and 3 diameter edge distance provided the values are reduced 50 percent. Linear interpolation may be used for intermediate spacings and edge margins.

* Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

Multi-Set II Drop-In Anchors — *Anchoring Overhead in 3000 PSI Lightweight Concrete On Metal Deck*



ANCHOR In. (mm)	DRILL HOLE DIAMETER	EMBEDMENT In. (mm)	3000PSI (20.7 MPa) CONCRETE ULTIMATE TENSION LOAD Lbs. (kN)		ALLOWABLE WORKING LOAD Lbs. (kN)
RX-38 Drop-In	1/2 (12.7)	3/4 (19.1)	Upper Flute	1,410 (6.3)	353 (1.6)
			Lower Flute	1,206 (5.4)	301 (1.3)

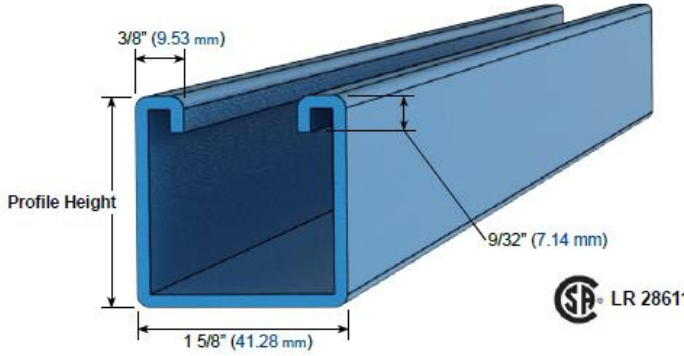
*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application

STRUT CHANNEL: SINGLE CHANNEL

STEEL SINGLE CHANNEL: PROFILES

Sasco offers an extensive range of sizes, gauges and multiple combinations of strut channels. Each channel incorporates a continuous slot along the full length and inturned edges that allow infinite design possibilities and cost effective installations. Standard lengths are 10 feet (-120) and 20 feet (-240). Custom lengths are also available. Many Sasco Strut Channels are CSA certified for use as electrical raceways when used as outlined on page 39. Engineering data is found on page 45.



Height (mm)	13/16" 20.64	1" 25.40	1 3/8" 34.93	1 5/8" 41.28	2 7/16" 61.91	3 1/4" 82.55
12 GA		S5	S8	S2	S1	S9
14 GA	S7			S4		
16 GA	S6			S3		

Example part numbers with Channel Profile highlighted:

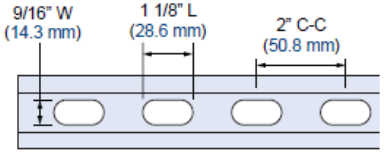
S2 SL2-G120 S5 G-240 S6 AL-120

STRUT CHANNEL: PRE-PUNCHED PATTERN

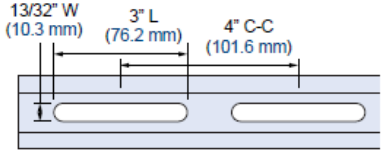
SLOTS AND HOLES

Sasco's Slotted Strut Channels provide adjustment for wall mounting, constructing trapeze supports and other suspension and mounting applications. Pre-galvanized steel is standard (-G). Also available in hot dip galvanized (HG) and plain steel (P). For availability of slots in stainless steel (SS), aluminum (AL) and fibreglass (FG), please consult Sasco. Also available in custom hole patterns.

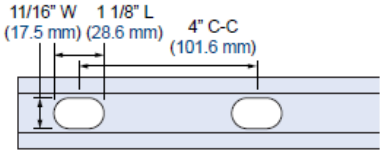
SL2 MOST COMMON



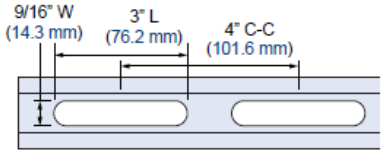
SL4



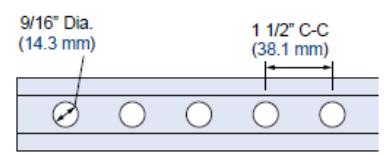
SL6



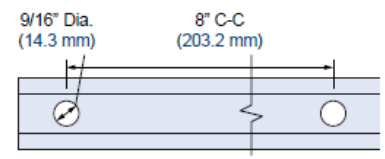
SL9



H112



H8



Example part numbers with Pre-Punch Pattern highlighted:

S2 SL2 -G240 S2 H112 -G120 S6 SL2 AL120

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application

STRUT CHANNEL: FINISHES AND MATERAILS

Sasco Strut Channels are roll formed from 33,000 psi steel. Steel channel engineering data is found on page 45.
Special coatings (paint, epoxy, PVC) can be supplied to your specification. Please consult Sasco for availability.

PRE-GALVANIZED STEEL

The standard material for Sasco Strut Channels. Steel sheet is coated with zinc using a hot dip process prior to manufacturing. The minimum weight of zinc is G90 under the general requirements of ASTM A653 (G90).

Use G in a part number to specify pre-galvanized finish

HOT DIPPED GALVANIZED STEEL

Steel strut channels and fittings are hot dip galvanized after fabrication and conform to ASTM A123 or A153.

Use HG in a part number to specify hot dip galvanized finish

PLAIN STEEL

The steel has a light surface coating of oil, just as it comes from the mill.

Use -P in a part number to specify plain steel finish

STAINLESS STEEL

Sasco Strut Channels are available in stainless steel in the following profiles:

Type: T304

Catalogue Prefix	H (Inches)	H (mm)	Thickness (Inches)
S2SS4	1 5/8	41.28	0.090
S5SS4	1	25.40	0.090
S2BBSS4	3 1/4	82.66	0.090
S5BBSS4	2	50.80	0.090

Type: T316

Catalogue Prefix	H (Inches)	H (mm)	Thickness (Inches)
S2SS6	1 5/8	41.28	0.090
S5SS6	1	25.40	0.090
S2BBSS6	3 1/4	82.66	0.090
S5BBSS6	2	50.80	0.090

ALUMINUM

Sasco Strut Channels are available in aluminum, extruded in the following profiles:

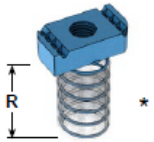
Catalogue Prefix	H (Inches)	H (mm)	Thickness (Inches)	Alloy/Temper
S1AL-	2 7/16	61.91	0.081	6063/T5
S2AL-	1 5/8	41.28	0.081	6063/T5
SH2AL-	1 5/8	41.28	0.103	6005A/T5
S6AL-	13/16	20.64	0.070	6063/T5
S2BB-AL	3 1/4	82.55	0.081	6063/T5

Example part numbers with material/finish highlighted:

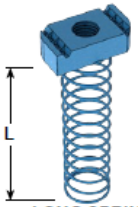
S2G-120 S2SL2HG240 S6AL-120

CLAMPING NUTS

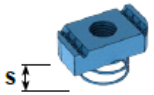
Sasco Clamping Nuts are fundamental to the Sasco Suspension System. They ensure positive locking between the nut's serrated grooves and the strut channel. When they are inserted anywhere along the continuous slot of the channel they allow attachment of fittings without drilling or welding. If changes are required, fittings are easily adjusted, removed or reused.



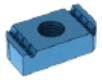
REGULAR SPRING
Used in all 1 5/8" wide Sasco Strut Channels except S5, S6 and S7.



LONG SPRING
Used in Sasco Strut Channels S1 and S9.



SHORT SPRING
Used in Sasco Strut Channels S5, S6 and S7.



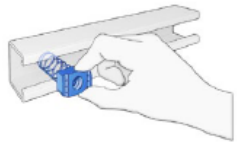
WITHOUT SPRING
Used in all 1 5/8" wide Sasco Strut Channels.

Thread Size	Catalogue Numbers				Spring Length		
Imperial	Regular Spring	Long Spring	Short Spring	Without Spring	R	L	S
1/4" - 20	S14 *	-	S14S	S14W	1.5"	-	0.375"
5/16" - 18	S516*	-	S516S	S516W	1.5"	-	0.375"
3/8" - 16	-	-	S3814S	-	-	-	0.375"
3/8" - 16	S38 *	S38L	-	S38W	1.5"	2.875"	-
1/2" - 13	S12 *	S12L	S12S	S12W	1.5"	2.875"	0.750"
5/8" - 11	S58	S58L	-	S58W	1.5"	2.875"	-
3/4" - 10	S34	S34L	-	S34W	1.5"	2.875"	-
Metric							
M6 - 1.00	S6M	-	S6MS	S6MW	38 mm	-	20 mm
M8 - 1.25	S8M	-	S8MS	S8MW	38 mm	-	20 mm
M10 - 1.50	S10M	-	S10MS	S10MW	38 mm	-	20 mm
M12 - 1.75	S12M	-	S12MS	S12MW	38 mm	-	20 mm

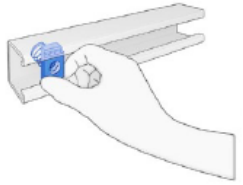
*Sasco Clamping Nuts marked with asterisks have plastic sleeves eliminating tangling during shipping and installation.

Sasco Steel Clamping Nuts are produced from hot rolled steel ASTM A108 Grades 1015 or 1020. Standard finish is electroplated zinc.
Some sizes available in stainless steel Type 316, hot dip galvanized, aluminum and fibreglass. Consult Sasco for availability.

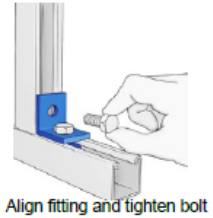
EASY, FAST INSTALLATION:



Insert Sasco Clamping Nut



Turn 90°



Align fitting and tighten bolt

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Technical Information – Structural Support Suspended Application

HEPAire Products (1986) Corporation

STUD NUTS

All Sasco Clamping Nuts are available as Stud Nuts (**SN**). To specify, select clamping nut (S38, S34S, S12W, etc.) and length of exposed thread (EX).

An S38 Stud Nut with a 1 1/2 inch thread exposure is S38SN112EX as a Part Number.
An S38 Stud Nut with a 2 inch thread exposure is S38SN2EX.

SEISMIC HANGER ROD STIFFENER

Sasco Seismic Hanger Rod Stiffener fastens 1 5/8" (41.3 mm) wide x 1 5/8" (41.3 mm) SR2 Strut Channel to the hanger rod as required by the design engineer.

Secures 3/8" through 5/8" diameter rod.

For more detail, refer to the Sasco Seismic Restraint Design Manual.

Standard finish is electroplated zinc.
Stainless steel available upon request.

SR38-RS

STRUT CHANNEL: LENGTHS

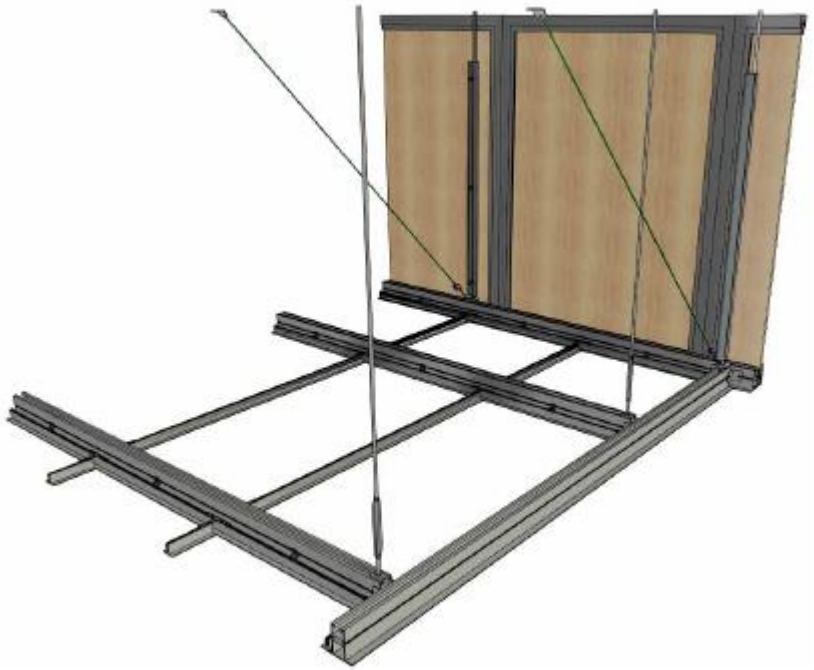
Standard lengths are 10 feet (120") and 20 feet (240"). Specify length in inches when ordering.

Sasco Strut Channel can be manufactured to custom lengths at the factory in a variety of materials, finishes and pre-punched patterns. Efficiencies are gained by eliminating errors on-site, reducing consumables in the field, and streamlining site delivery. A cost-effective option. Please consult Sasco for details.

Note: the best production efficiency of Pre-Punched and Slotted Strut Channel is achieved when lengths are in multiples of the slot pattern centres "C" shown on page 5.

Example part numbers with specified length highlighted:

S2G-240 **S5SS4-120** **S2SL2HG-48**



HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application

SEISMIC HANGER ROD STIFFENER

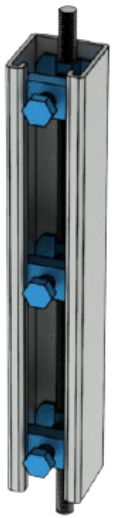
Sasco Seismic Hanger Rod Stiffener fastens 1 5/8" (41.3 mm) wide x 1 5/8" (41.3 mm) SR2 Strut Channel to the hanger rod as required by the design engineer.

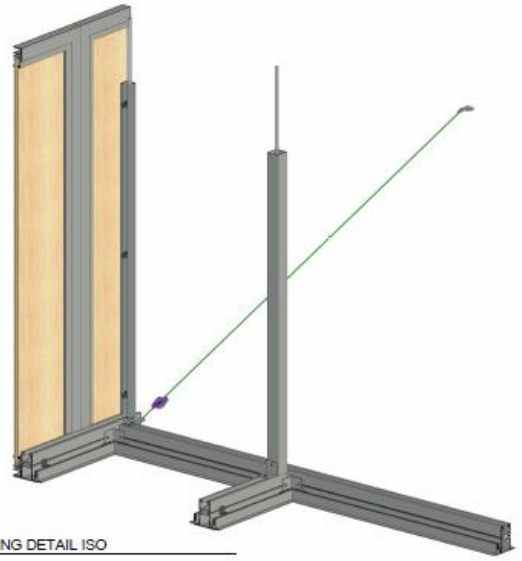
Secures 3/8" through 5/8" diameter rod.

For more detail, refer to the Sasco Seismic Restraint Design Manual.

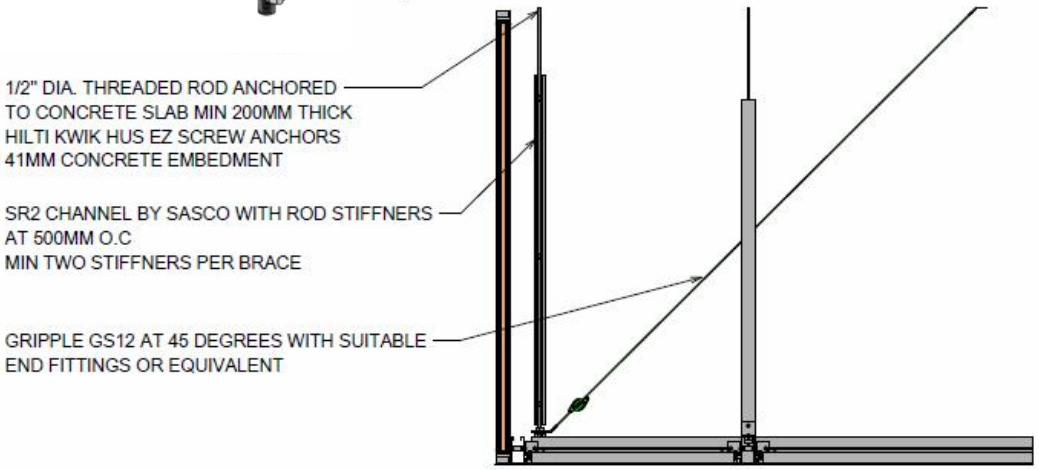
Standard finish is electroplated zinc.
Stainless steel available upon request.

SR38-RS

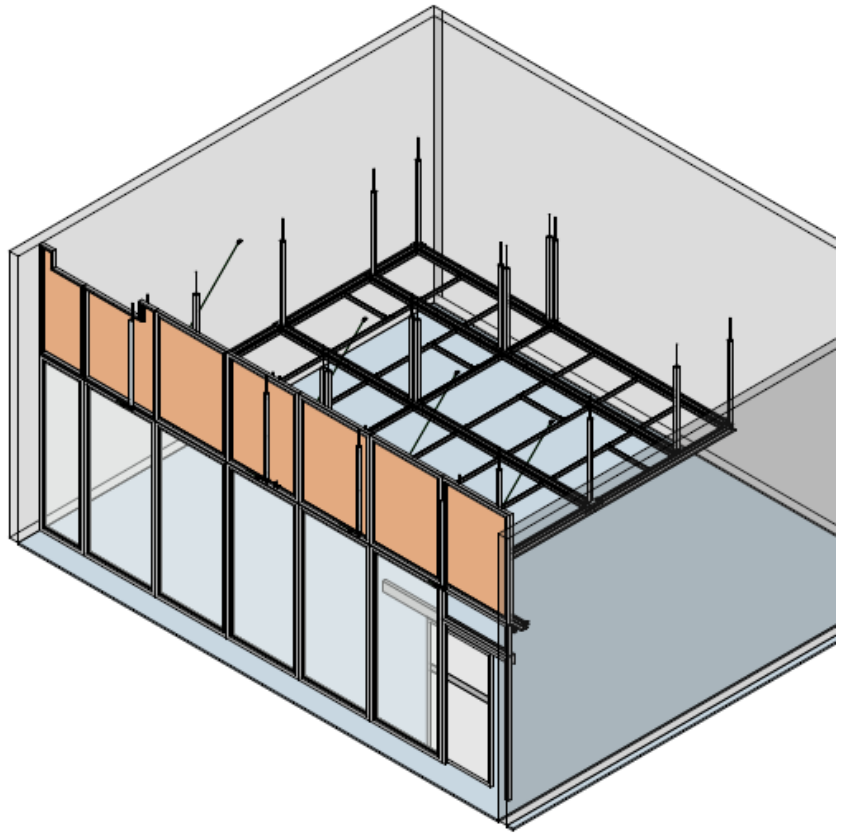




④ BRACING DETAIL ISO



⑤ BRACING DETAIL



REVIEWED FOR STRUCTURAL
DESIGN & LOADING ONLY

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application

HEPAire Products (1986) Corporation

GRIPPLE

Seismic & Force Protection

For Non-Structural Building Components

- Engineering services
- Cable bracing systems
- Vibration isolation
- Meets all seismic design code requirements

Cable Bracing

The System

Gripple Seismic Cable Bracing Systems are specifically designed and engineered to brace and secure suspended non-structural equipment (VAV boxes, fans, unit heaters, in-line pumps, etc.) and components (HVAC duct, conduit/ cable tray, and piping) within a building or structure to minimize damage from an earthquake or a seismic event.

The systems are ideal for use on non-structural components and equipment requiring seismic design, such as in post-disaster facilities that are required for emergency operations in the aftermath of an earthquake.

Gripple Seismic Cable Bracing Systems offer the following advantages:

- Complete pre-engineered systems
- No field swaging of cables
- Up to 10 times faster to install than traditional methods
- No tools required
- Colour coding allows easy field verification from the ground
- Suitable for new or retrofit installations
- Can be used in a variety of bracing configurations (transverse, longitudinal, 4-way)
- OSHPD OPA 2123-10 approval (GS10, GS12, and GS19 systems)
- SMACNA verified
- UL tested for NEBS GR 63 Core

All systems satisfy National Building Code of Canada

Complete bracing kits include a length of cable with pre-attached end fitting, colour-coded tag, Gripple Seismic fastener, and standard or retrofit bracket. Four kit sizes are available:

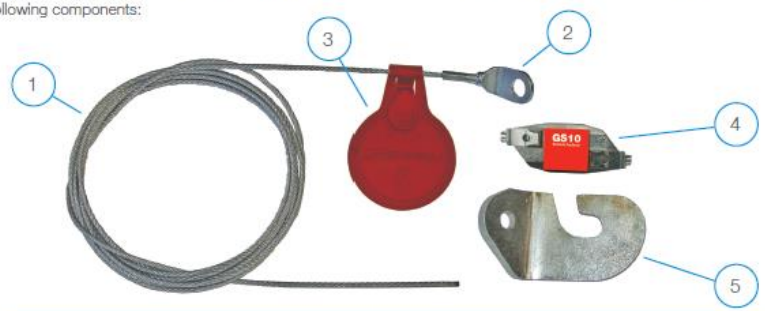
Kit	GS10	GS12	GS19	GS25
Tag Colour	Red	Green	Yellow	Purple
Design Strength (LRFD*)	400 lbf / 181 kg	945 lbf / 429 kg	2265 lbf / 1,027 kg	3570 lbf / 1,619 kg

Note: Specified Load and Resistance Factor Design Strength (LRFD) does not correspond to the component or system weight being braced. Please refer to the project specific engineering documentation for appropriate Gripple Seismic restraint kit selection.

Transverse Bracing | Longitudinal Bracing | 4-way Bracing

Components

There are four Gripple Seismic Cable Bracing kit sizes available, each with its own Load and Resistance Factor Design (LRFD), selection of cable lengths, pre-attached end fittings, and bracket. As part of our Engineering services, Gripple will ensure that the bracing meets the seismic design requirements of the non-structural components as related to weight loads and types of connections. Complete Cable Bracing Kits include the following components:



1 Gripple Seismic Cable

Break strength certified, pre-stretched Gripple Seismic cable. Available in lengths of 10 ft, 15 ft, and 20 ft.

2 End Fitting

E = 45° Eyelet | S = Standard Bracket *w/ Zinc plated copper ferrules | DS = Double Standard Bracket *w/ Zinc plated copper ferrules

3 Color Coded Tag

Pre-assembled color coded tag for attaching to cable for easy field verification of cable diameter.
GS10 = Red, GS12 = Green, GS19 = Yellow, GS25 = Purple

4 Gripple Seismic Fastener

5 Loose Bracket

Standard or Retrofit Bracket in
Single or Double Bracket configurations.

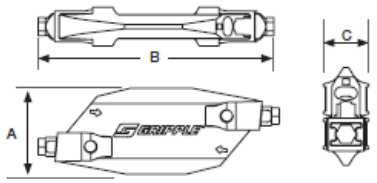
Standard Bracket | Retrofit Bracket

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS
Technical Information – Structural Support Suspended Application

HEPAire Products (1986) Corporation

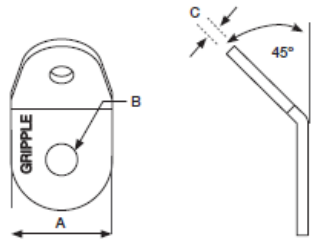
Component Dimensions

SEISMIC FASTENER



	Dimensions (inches)					
	A		B		C	
	in	mm	in	mm	in	mm
GS10	1 1/8"	29	3"	76	1/2"	13
GS12	1 1/8"	29	3 1/4"	83	9/16"	14
GS19	1 5/16"	34	3 3/4"	95	9/16"	14
GS25	1 3/4"	44	4 5/8"	118	11/16"	17

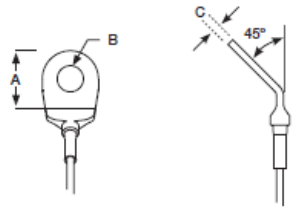
STANDARD BRACKET



	Dimensions (inches)						Compatability			
	A		B To suit rod size:		C					
	in	mm	in	mm	in	mm	GS10	GS12	GS19	GS25
S4	1 9/16"	40	3/8"	M10	5/32"	4	✓	✓	✓	✗
S5	1 5/8"	42	1/2"	M12	5/32"	4	✓	✓	✓	✗
S6	1 5/8"	42	5/8"	M16	5/32"	4	✗	✓	✓	✓*
S8	1 7/8"	47	3/4"	M20	5/32"	4	✗	✗	✓	✓*
S10	2 1/8"	54	1"	M24	5/32"	4	✗	✗	✗	✓*

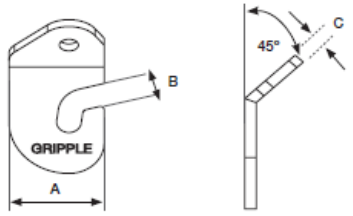
*double bracket supplied with GS25 kits

45° EYELET



	Dimensions (inches)						Compatability			
	A		B To suit fixing size:		C					
	(in)	(mm)	(in)	(mm)	(in)	(mm)				
E4	1"	25	3/8"	M10	1/8"	3	✓	✓	✗	✗

RETROFIT BRACKET



	Dimensions (inches)						Compatability			
	A		B To suit rod size:		C					
	in	mm	in	mm	in	mm	GS10	GS12	GS19	GS25
R4	2"	50	3/8"	M10	1/4"	6	✓	✓	✓	✗
R5	2"	50	1/2"	M12	1/4"	6	✓	✓	✓	✗
R6	2"	50	5/8"	M16	1/4"	6	✗	✓	✓	✓*
R8	2 3/8"	60	3/4"	M20	1/4"	6	✗	✗	✓	✓*
R10	2 3/8"	60	1"	M24	1/4"	6	✗	✗	✗	✓*

*double bracket supplied with GS25 kits

Kit Codes

Gripple Seismic Kit Size	Length	Seismic Bracket	Rod/ Structural Attachment Size	Product Code
GS10 LRFD* 400 lbf / 181 kg	10 ft	Standard	⅜"	GS10-10E4-S4-2P
			½"	GS10-10S5-S5-2P
		Retrofit	⅜"	GS10-10E4-R4-2P
			½"	GS10-10S5-R5-2P
	15 ft	Standard	⅜"	GS10-15E4-S4-2P
			½"	GS10-15S5-S5-2P
		Retrofit	⅜"	GS10-15E4-R4-2P
			½"	GS10-15S5-R5-2P
	20 ft	Standard	⅜"	GS10-20E4-S4-2P
			½"	GS10-20S5-S5-2P
		Retrofit	⅜"	GS10-20E4-R4-2P
			½"	GS10-20S5-R5-2P
GS19 LRFD* 2265 lbf / 1,027 kg	10 ft	Standard	⅜"	GS19-10S4-S4-2P
			½"	GS19-10S5-S5-2P
			⅝"	GS19-10S6-S6-2P
			¾"	GS19-10S8-S8-2P
		Retrofit	⅜"	GS19-10S4-R4-2P
			½"	GS19-10S5-R5-2P
			⅝"	GS19-10S6-R6-2P
			¾"	GS19-10S8-R8-2P
	15 ft	Standard	⅜"	GS19-15S4-S4-2P
			½"	GS19-15S5-S5-2P
			⅝"	GS19-15S6-S6-2P
			¾"	GS19-15S8-S8-2P
		Retrofit	⅜"	GS19-15S4-R4-2P
			½"	GS19-15S5-R5-2P
			⅝"	GS19-15S6-R6-2P
			¾"	GS19-15S8-R8-2P
	20 ft	Standard	⅜"	GS19-20S4-S4-2P
			½"	GS19-20S5-S5-2P
			⅝"	GS19-20S6-S6-2P
			¾"	GS19-20S8-S8-2P
		Retrofit	⅜"	GS19-20S4-R4-2P
			½"	GS19-20S5-R5-2P
			⅝"	GS19-20S6-R6-2P
			¾"	GS19-20S8-R8-2P

Gripple Seismic Kit Size	Length	Seismic Bracket	Rod/ Structural Attachment Size	Product Code
GS12 LRFD* 945 lbf / 429 kg	10 ft	Standard	⅜"	GS12-10E4-S4-2P
			½"	GS12-10S5-S5-2P
			⅝"	GS12-10S6-S6-2P
		Retrofit	⅜"	GS12-10E4-R4-2P
			½"	GS12-10S5-R5-2P
			⅝"	GS12-10S6-R6-2P
	15 ft	Standard	⅜"	GS12-15E4-S4-2P
			½"	GS12-15S5-S5-2P
			⅝"	GS12-15S6-S6-2P
		Retrofit	⅜"	GS12-15E4-R4-2P
			½"	GS12-15S5-R5-2P
			⅝"	GS12-15S6-R6-2P
	20 ft	Standard	⅜"	GS12-20E4-S4-2P
			½"	GS12-20S5-S5-2P
			⅝"	GS12-20S6-S6-2P
		Retrofit	⅜"	GS12-20E4-R4-2P
			½"	GS12-20S5-R5-2P
			⅝"	GS12-20S6-S6-2P
GS25 LRFD* 3570 lbf / 1,619 kg	10 ft	Standard	⅜"	GS25-10DS6-DS6-2P
			¾"	GS25-10DS8-DS8-2P
			1"	GS25-10DS10-DS10-2P
		Retrofit	⅜"	GS25-10DS6-DR6-2P
			¾"	GS25-10DS8-DR8-2P
			1"	GS25-10DS10-DR10-2P
	15 ft	Standard	⅜"	GS25-15DS6-DS6-2P
			¾"	GS25-15DS8-DS8-2P
			1"	GS25-15DS10-DS10-2P
		Retrofit	⅜"	GS25-15DS6-DR6-2P
			¾"	GS25-15DS8-DR8-2P
			1"	GS25-15DS10-DR10-2P
	20 ft	Standard	⅜"	GS25-20DS6-DS6-2P
			¾"	GS25-20DS8-DS8-2P
			1"	GS25-20DS10-DS10-2P
		Retrofit	⅜"	GS25-20DS6-DR6-2P
			¾"	GS25-20DS8-DR8-2P
			1"	GS25-20DS10-DR10-2P

* Note: Specified Load and Resistance Factor Design Strength (LRFD) does not correspond to the component or system weight being braced. Please refer to the project specific engineering documentation for appropriate Gripple Seismic restraint kit selection.

Example Code:

G	S	1	2	-	1	0	E	4	-	S	4

Cable Size
GS10=5/64"
GS12=1/8"
GS19=3/16"
GS25=1/4"

Cable Length
10 ft
15 ft
20 ft

End Fitting
E = 45° Eyelet
S = Standard Single Bracket
DS = Standard Double Bracket

End Fitting Size
4=3/8
5=1/2"
6=5/8"
8=3/4"
10= 1"

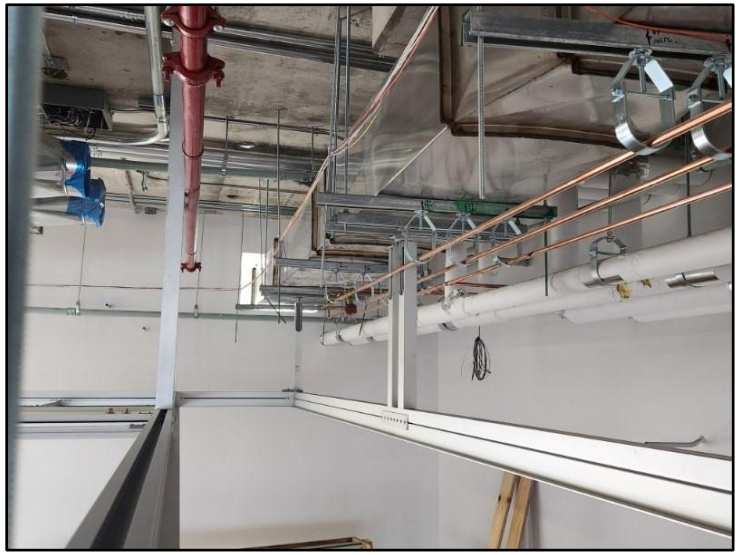
Style of Loose Bracket
S=Standard Bracket
R=Retrofit Bracket
DS=Double Standard Bracket
DR=Double Retrofit Bracket
(Double brackets for GS25 only)

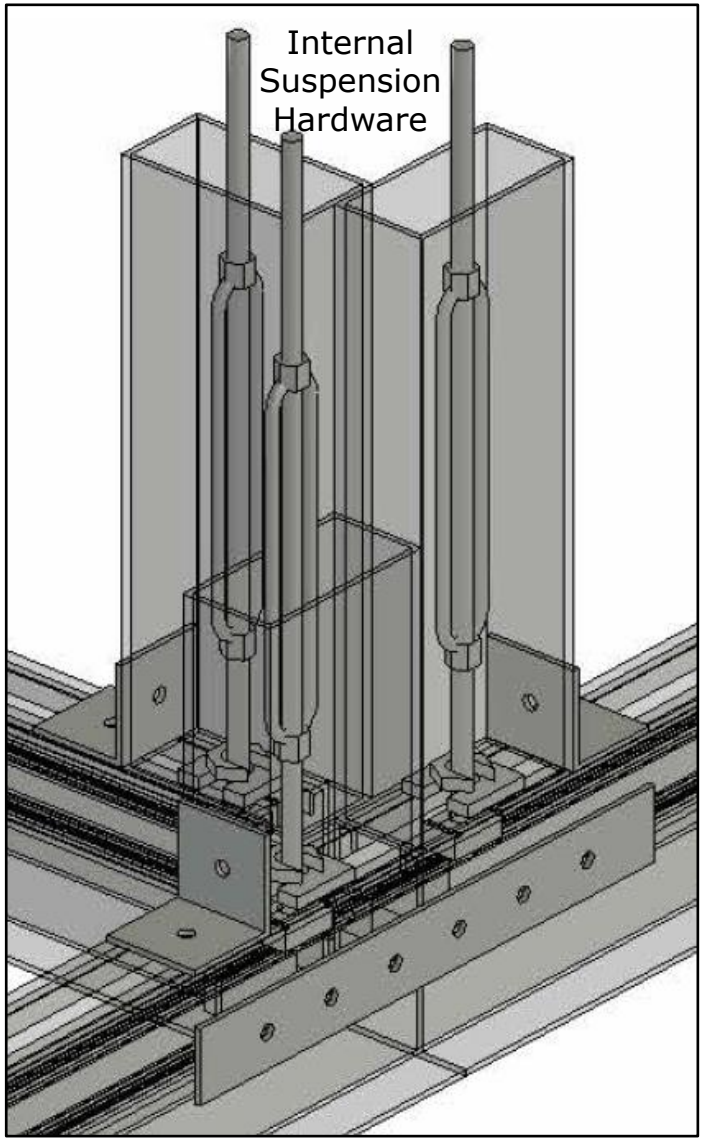
Loose Bracket Size
4=3/8"
5=1/2"
6=5/8"
8=3/4"
10= 1"

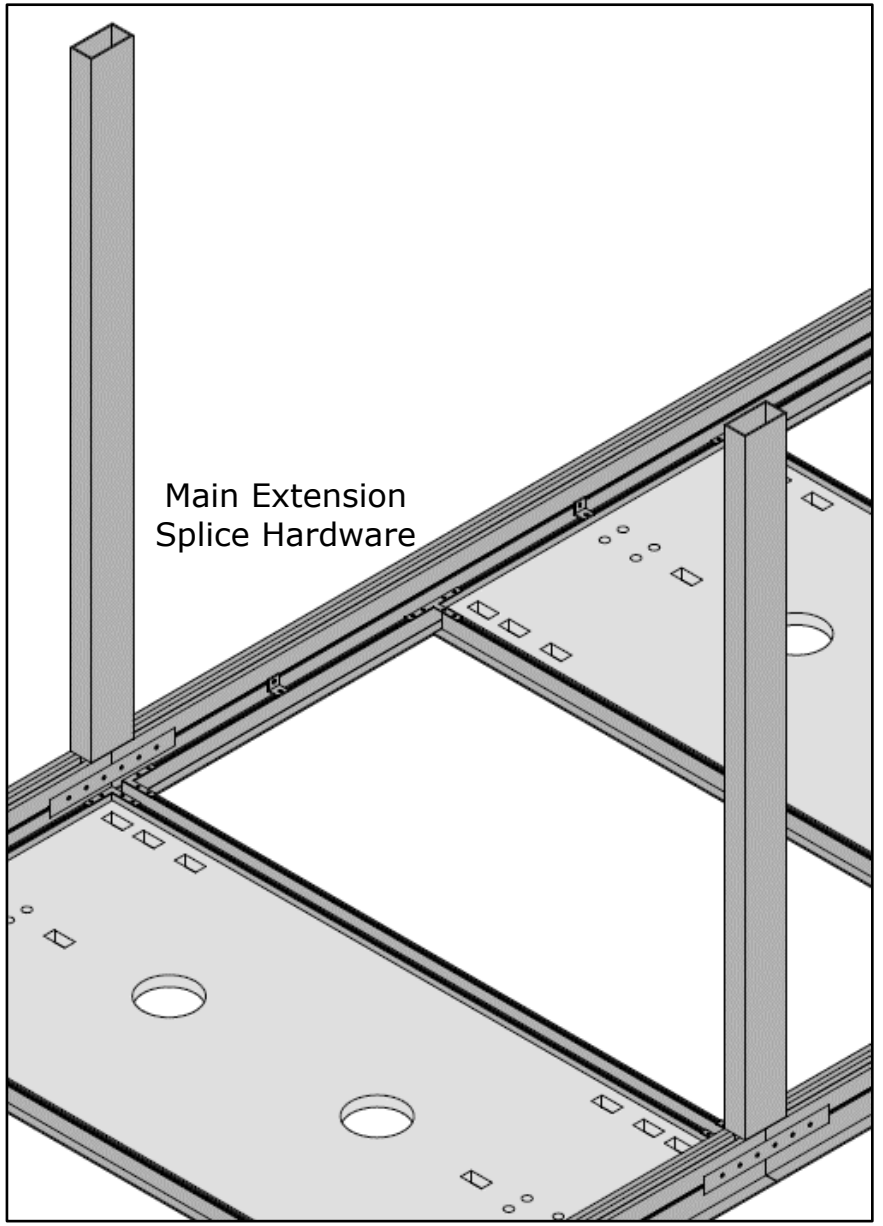
Gripple Seismic Technical Installation manual should be consulted when designing or installing Gripple Seismic bracing kits.

HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS - SUPPORTS

Typical Suspended Kit hardware package. Kit includes a fully encapsulated aluminum vertical framing with 3/8”diameter threaded rod with spring nut compression strut and slip on locking nut washer which is then attached to our top notch lock on main framing member with turnbuckle termination on other end for attachment to building structure. Length of final threaded rod connection and anchor or beam selection to be site specific determined.





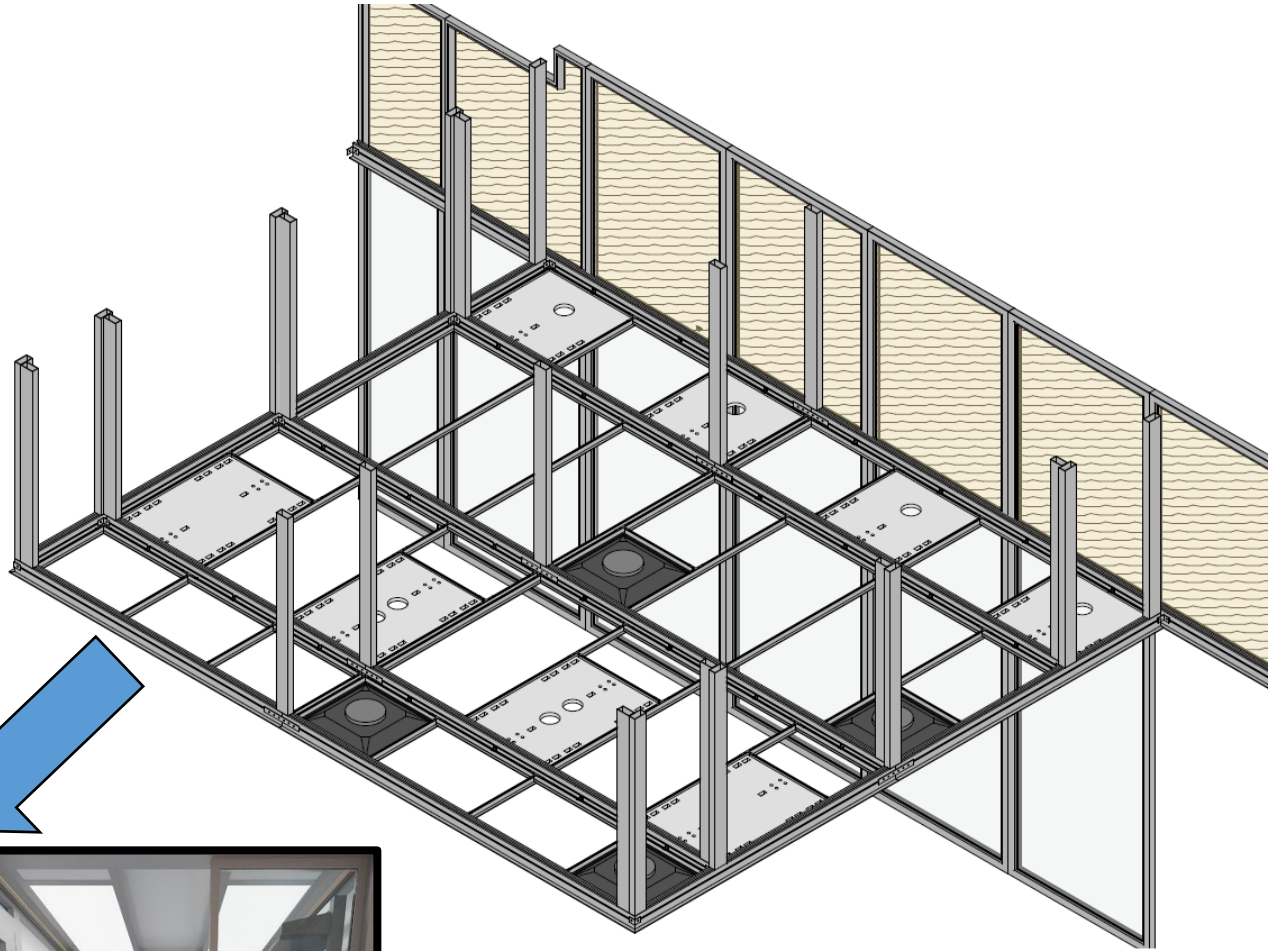


HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS – CEILING LADDERS

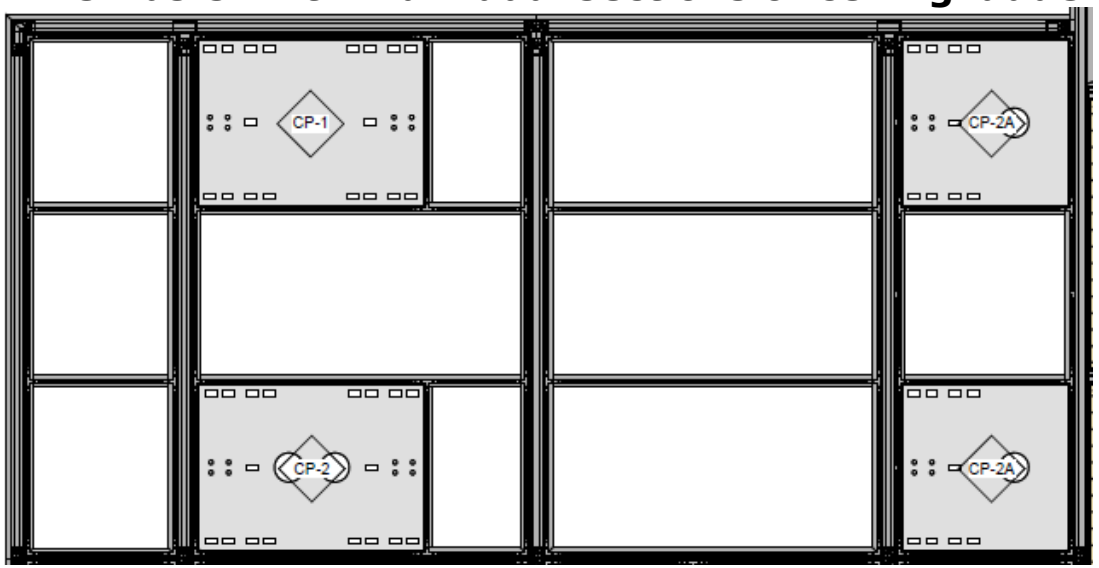
Technical Information – Perimeter Support “L” Framing

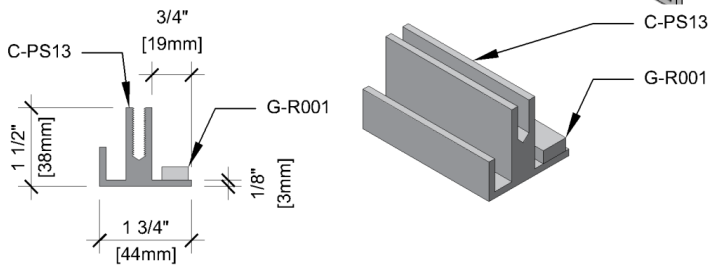
Ladders are constructed from perimeter support "L" framing constructed from linear 6063-T5 aluminum members designed to specific application. Ladders and are factory assembled by placement of our 2-way corner connector hardware anchored directly to integral perimeter screw boss with cross support "T" framing attached by placement of our 3-way connectors and in specific cases, the 4-way connectors depending on the application.

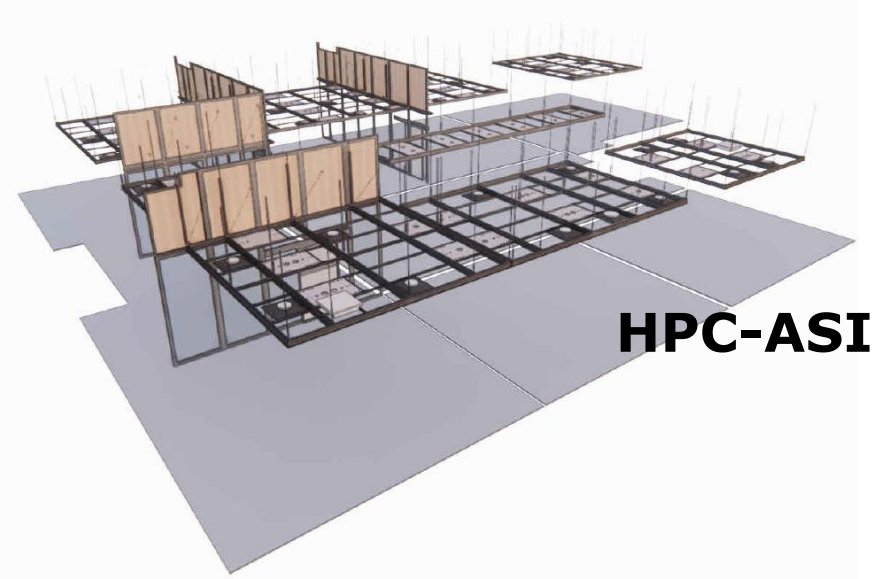
Factory assembled ladders allow for rapid site assembly of lab media ceilings.



Typical Perimeter Support “L” Framing with cross tee members with individual sections of ceiling ladders







HPC-ASI-LMC -SERIES –LAB MEDIA CEILING GRID SYSTEMS
TECHNICAL SPECIFICATIONS

HEPAire Products (1986) Corporation

ALL MODULAR LAB MEDIA CEILING GRID SYSTEMS - SECTION 132113

2" LAB MEDIA CEILING GRID SYSTEMS TECHNICAL SPECIFICATIONS

SECTION 1 GENERAL

1.01.1 GENERAL INFORMATION

This Section specifies all requirements necessary to furnish and install complete all modular aluminum lab media ceiling grid, blank panels, lights, and filtration devices including, but not limited to the following:

1. All modular 2" aluminum lab media ceiling system, completely factory prepared, and product assembled as indicated on the drawings, including all installation support hardware.
2. Ceiling blanks constructed from selected core and finish as per schedule on drawings.
3. Extrusions, fasteners, trim finishing, and angles necessary to maintain system structural integrity and provide air restrictive installation.
4. Light and filtration assemblies as per schedule on drawings.
5. Provide all sealed cut outs and coordinate with fire protection as per schedule on drawings.
6. Coordinate installation with other trades to avoid onsite conflicts.

1.02 RELATED SECTIONS

The Sections listed below shall be used in conjunction with the following specifications and related contract documents to establish the total requirements for the referenced System.

Division 5 – Metals for structural elements required to support ceilings.
Division 9 – Finishes for metal studs to support liner wall panels.
Division 21 – Fire Suppression Systems.
Division 22 – Plumbing.
Division 23 – Heating Ventilation and Air Conditioning.
Division 26 – Electrical.

1.03 REFERENCE STANDARDS

This Section specifies standard requirements necessary to furnish and install lab media ceiling grid including, but not limited to the following:

1. ASTM D 3273 Standard Test Method for Resistance to growth of mold on the surface coatings.
2. ASTM D 3274 Standard Test Method for evaluating degree of surface disfigurement of paint films by fungal or algal growth, or soil and dirt accumulation.
3. ASTM E 84 Standard test method for surface burning characteristics of building materials.

1.03.1 SUBMITTALS

1. Manufacturer's literature, specifications, details, and installation instructions for each component proposed for use, including technical data as may be required to show compliance with the specifications.
2. One sample of system components with specified finish, and connectors. Include any other components as necessary to illustrate a completed assembly.

1.03.2 QUALITY ASSURANCE

1. Award the work to a firm who has a minimum of 5 years experience in the manufacturing and installation of ceiling grid systems.

1.03.3 DELIVERY, STORAGE, AND HANDLING

1. Deliver materials in unopened crated packages.
2. Exercise extreme care in handling all System components to prevent any damage.
3. Store materials within the building in the space designated for storage. Store materials to prevent any damage or intrusion of foreign matter. Any damaged materials must be noted and scheduled with the job site installation foreman for removal and replacement from the jobsite prior to installation.

1.03.4 WARRANTY

Lab Media Ceiling system and modular components shall be warranted against defects and workmanship for a period of one (1) year from date of original shipment. The Lab Media Ceiling System supplier shall not be responsible for or liable for any modifications, alterations, misapplication, or repairs made to the products in the field after product final acceptance from owner.

1.03.5 TECHNICAL SERVICES

Lab Media Ceiling System Supplier must offer technical service support from both the factory and field representative for all services regarding layout, design, and product selection, as well as suggested specifications.

SECTION 2 PRODUCTS

2.01 PRODUCT NAME

ASI-LMC Series nominal 2" Lab Media Ceiling Grid consisting of the following modules:
Wall Perimeter Ladder Framing - Part Number C-PS13
Main Support Tee – Part Number – C-MS14
Cross Tee – Part Number – C-CD16

2.02 MANUFACTURER / SUPPLIER

Manufacturer: Aluminar Systems Inc.
157 Forest Plain Road, Oro-Medonte, Ontario, Canada L3V 0R4

Supply Integrator: HEPAIRE PRODUCTS (1986) CORPORATION, Controlled Environments Group
120 Terence Matthews Crescent, Unit F1, Kanata, Ontario, Canada K2M 0J1

Ottawa Tel: 613-366-4984 Fax: 613-831-4966 Toronto Tel: 416-477-4984
Email: info@hepaireproducts.com **Web:** www.hepaireproducts.com

2.03 PRODUCT DESCRIPTION ASI-LMC SERIES 2" ALUMINUM LAB MEDIA CEILING GRID

1. General Description: ASI-LMC Series - Extruded aluminum 2" Lab Media Ceiling Grid Series is designed to provide a clean and reliable system for a range of applications ensuring quality and performance geared to the expectations for which the product is being designed. The lab media ceiling grid shall be manufactured of extruded alloy 6063 temper T5 with a clear anodized or optional epoxy white powder coat finish. Wall perimeter ladder framing starts consisting of primary perimeter framing part#C-PS13 complete in ladder direction of cross tees part#C-CD-16, with secondary main support tee's part#C-MS14. The grid profile shall have continuous integral top "U" channel notch lock for placement of attachment hardware or suspension adjustable hardware barrel locknut for the attachment to threaded rod and turn buckles to facilitate ease of field installation in suspended applications. All cross tees to have both ends factory pre-set with grid-to-grid "T" part#C-3WAY attachment hardware to insure face alignment with wall perimeter ladder framing with part#2-WAY corner connectors. All grid members to have factory applied grey PVC precision cut with overhanging edges on cross tees to insure complete seal at all grid intersections.

   ASI-LMC Series – Extruded aluminum Modular Lab Media Ceiling Grid System is designed for easy ceiling placement with secondary support spacing of nominal 5' x 10'.

   The perimeter wall support framing components shall be a fully modular design with integral structure with wall and ceiling interface anchoring with supporting top side "U" channel placed integral to the grid with clear anodized or white powder coat finish.

   Materials and connections shall be manufacturer's standard, capable of assembly without the use of any special tooling.

2. Blank ceiling panel/core construction: All blank ceiling panel systems shall be constructed from the types listed below. Refer to cleanroom ceiling system schedule on drawings for panel selection.

   2.1 Gypsum core ceiling blanks with vinyl facings, sealed edges, fire retardant back facings.
   2.2 Aluminum honeycomb core ceiling blanks with prefinished white aluminum facing.
   2.3 Aluminum panels with prefinished white facing.
   2.4 Steel panels with white powder coat finish.
   2.5 PVC extruded core with white PVC facings.
   2.6 Clear polymer-based panels with protective coatings.

3. Panel thickness: The total panel shall not exceed 3/8" total thickness.

4. Panel width: Each panel shall be nominal 24" wide by 48" long, or as sizes listed on drawings.

5. Standard manufacturer's panel color is white.

6. Panels shall conform to ASTM E 84: for flame spread and a smoke developed.

7. Modular aluminum grid members manufactured from extruded alloy 6063/65 T5 with clear anodized or white powder coat finish. (Consult drawing schedule for location and type)

8. Suspension system to consist of grid connectors with 3/8" threaded rod – ASTM rated LH/RH to 12" length with integral turnbuckle including aluminum nominal 2" x 4" enclosure panel secured to top side notch on main tee to conceal exposed threaded rod (consult drawing schedule for location and type)

9. Modular lab media ceiling system shall be capable of incorporating fire protection devices in grid members or blank ceiling panels. (Consult drawing schedule for location and type)

10. Modular lab media ceiling system shall be capable of incorporating light fixtures along lab media grid downstream surface side or flush integration with lab media ceiling grid. (Consult drawing schedule for location and type)

11. Modular lab media ceiling system shall be capable of incorporating filtration devices. (Consult drawing schedule for location and type)

SECTION 3 EXECUTION

3.01 INSTALLATION

Final installation of lab media ceiling system components shall assemble into a rigid structure with tight straight-line joints. Completed installation shall be free of exposed bolts, nuts, rivets, and fasteners.

3.02 CONDITIONS OF SURFACES

Examine all ceiling system surfaces and adjoining construction conditions under which work is to be installed. Do not proceed with the work until the proper site protocol conditions have been provided.

3.03 MATERIAL INVENTORY

Inspect all materials upon arrival to jobsite to ensure correct quantity, finishes, and quality of product. Report, in writing, any conditions to the materials that appear to have failed in general durability or any other form of apparent deterioration.

3.04 SITE ASSEMBLY

1. Verify dimensions of supporting structure by field measurements so that the System will be accurately designed, fabricated, and fitted to the proposed space.
2. Coordinate with the work of related sections and provide items to be placed during installation of other work at the proper time to avoid delays in the work.
3. Assemble all component parts in accordance with the manufacturer's written instructions and recommendations.
4. Assemble all component parts within the factory recommended tolerances.
5. Do not assemble members which are observed to be warped, bowed, deformed, or otherwise damaged or defaced to such as to impair strength or appearance. Remove and replace members damaged in the process of site assembly.
7. Set units' level, plumb and true to line with uniform joints.

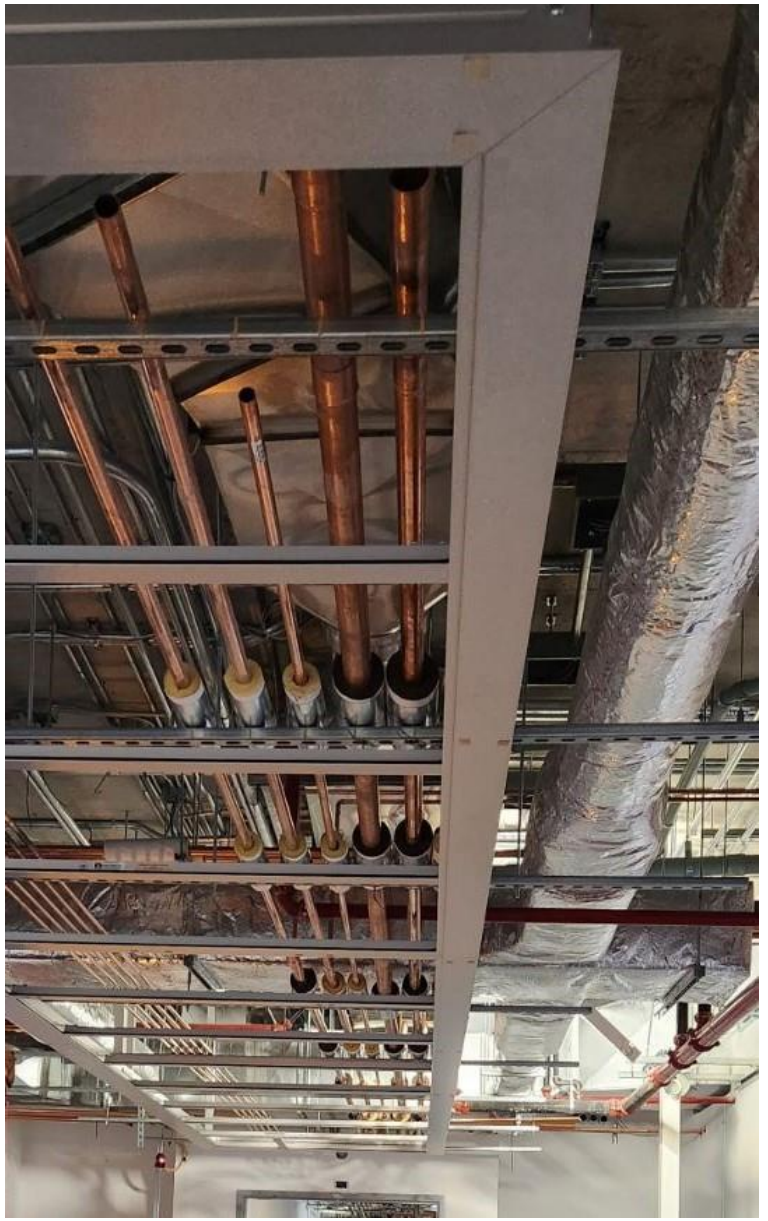
3.05 CLEANING

1. Provide cleaning methods required for each component part as recommended by the respective manufacturers.
2. Cleaning methods shall be carefully selected, applied, and maintained so that finishes will not become uneven or otherwise impaired.

3. Project protocol requires that special attention to minimizing potential contamination of the fully developed environment. Daily cleanup and vacuuming of the work area is essential to an ongoing control of contaminants, especially as the project fit-up progresses.

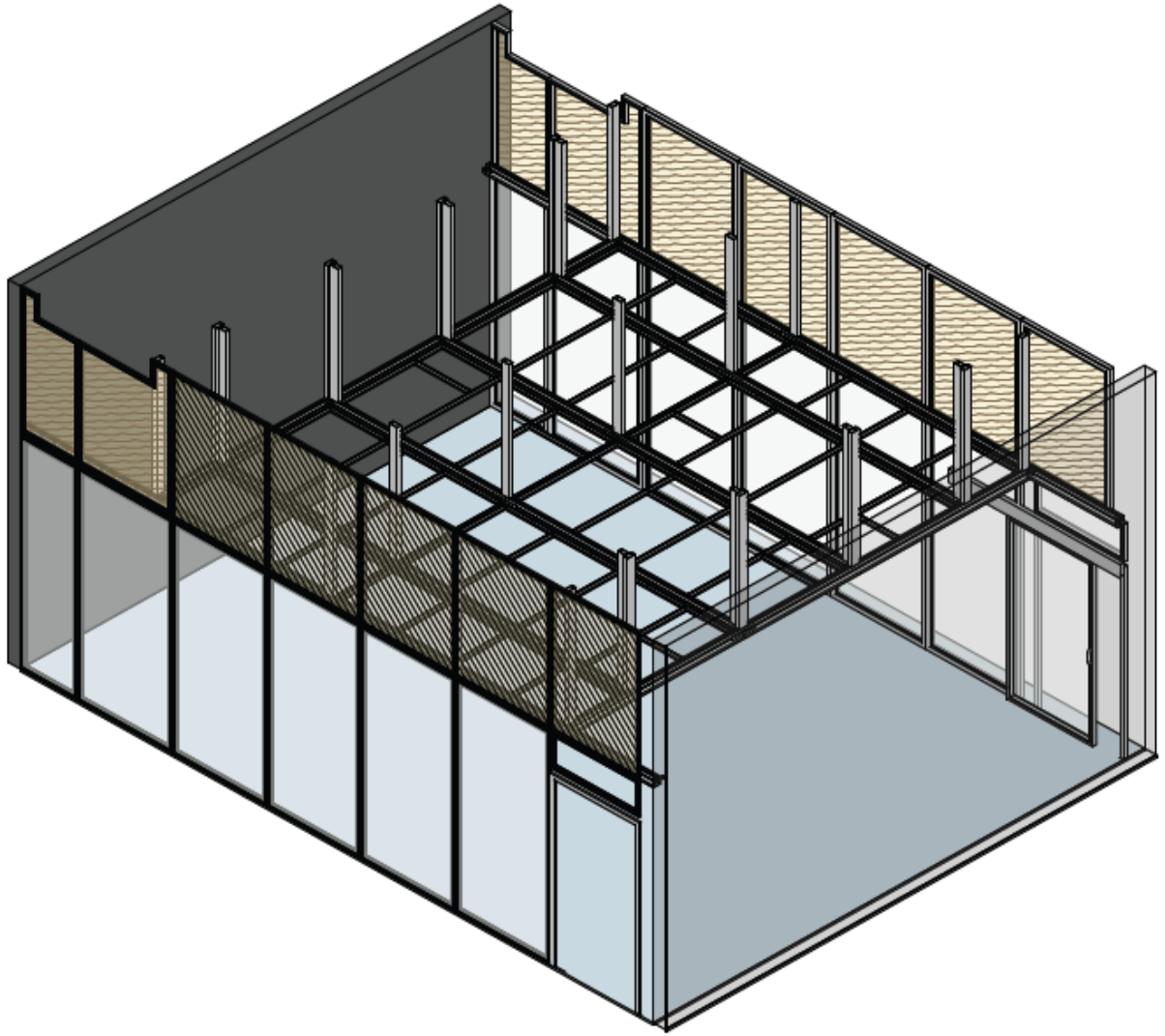
3.06 PROTECTION

1. Protect the System throughout the construction period in a clean and properly protected condition so that it will be without any indication of use or damage at the time of substantial completion.
2. All work must be protected during shipment, storage, assembly, and construction so as to avoid development of nonconformity of appearance or other deleterious effects in the work.



HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS – PARTITION SYSTEMS

- For large scale ballroom laboratory media ceiling module layouts, we have designs available in a range of layouts to create the end use laboratory application.
- Clients can integrate lab media ceilings to integrate with open or island working laboratory designs including the incorporation of environmental rated space with ducted, plenum, or open ceiling designs, soffit enclosure walls and removable divider walls with integrated swing or slider door access all of which provide flexibility in laboratory expansions.
- Integration of flexible ceiling service distribution paths, incorporation of airflow delivery and extraction devices, sensor technology and facility controls.



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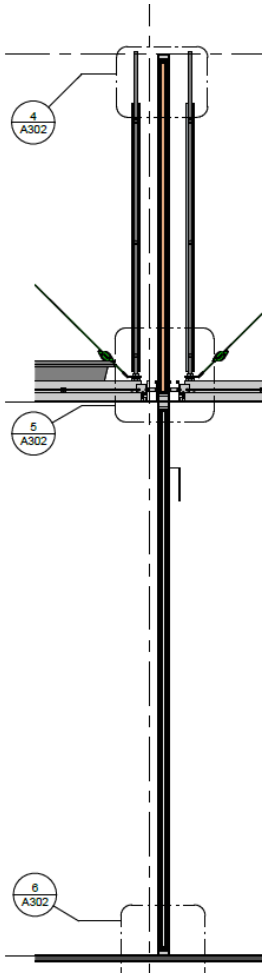
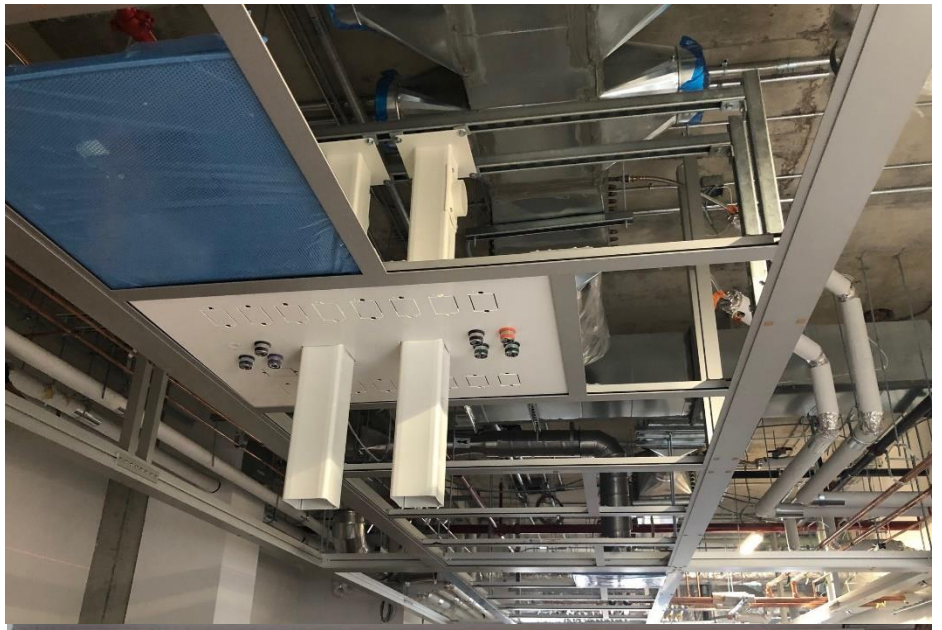
HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS – PARTITION SYSTEMS

Combination Separation Divider Barrier Wall with Sliding Doors

Interstitial Separation Partitions





HPC-ASI-LMC – SERIES LAB MEDIA CEILING GRID SYSTEMS

HPC-ASI-LMC Series Laboratory Media Ceilings are designed to assist in the ever-changing laboratory design needs to create the next generation of social adaptable open design laboratories which can foster team-based research interaction while providing a system design balance of flexibility, ease of expansion and equipment placement, with a forum of pre-engineered standard design elements for integration of todays advanced technologies.

HPC-ASI-LMC Series Laboratory Media Ceilings provide unique ultra clean ceiling and wall system design integration which now provides laboratory research facilities an alternative to conventional laboratory design methodology.

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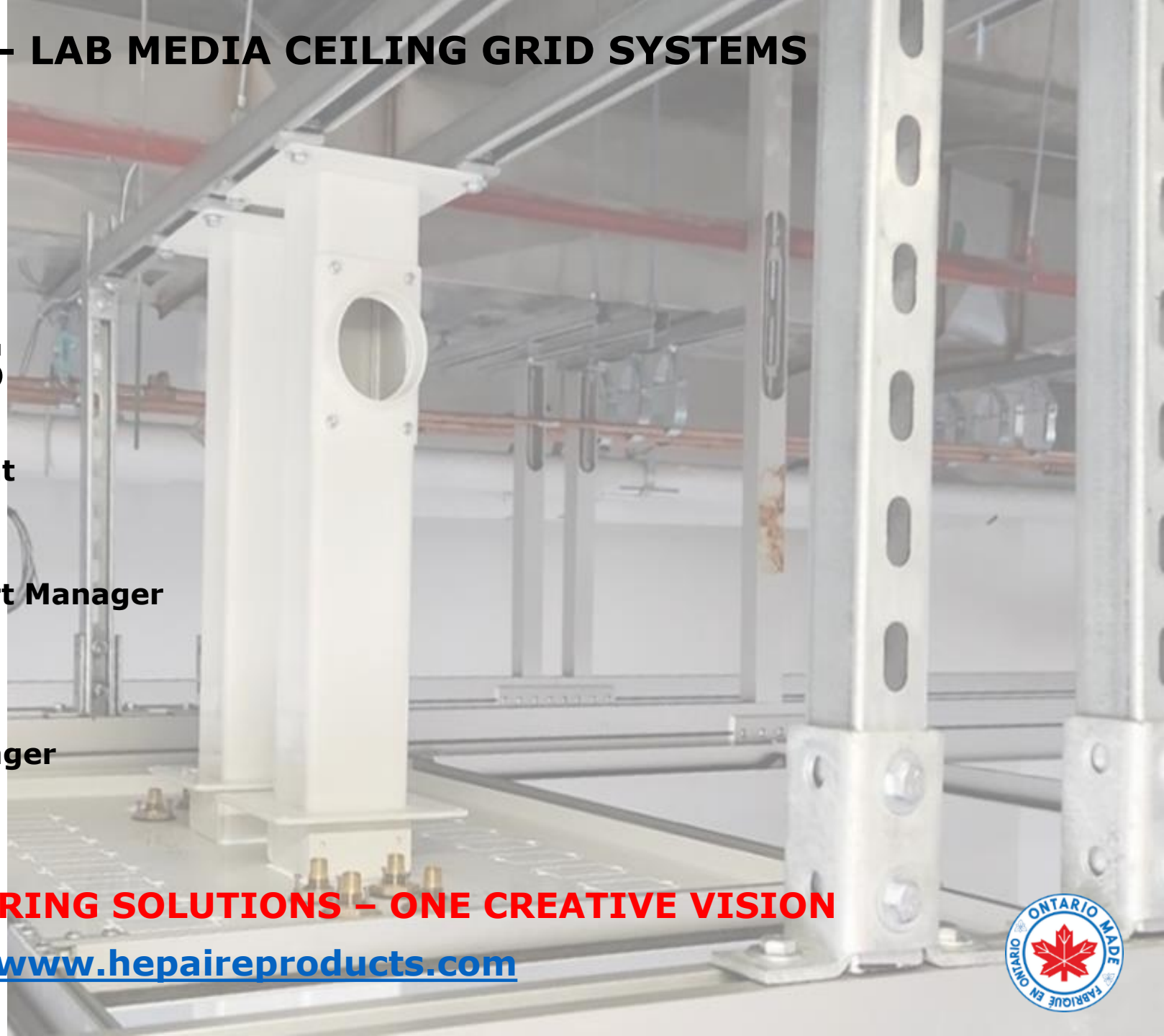

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