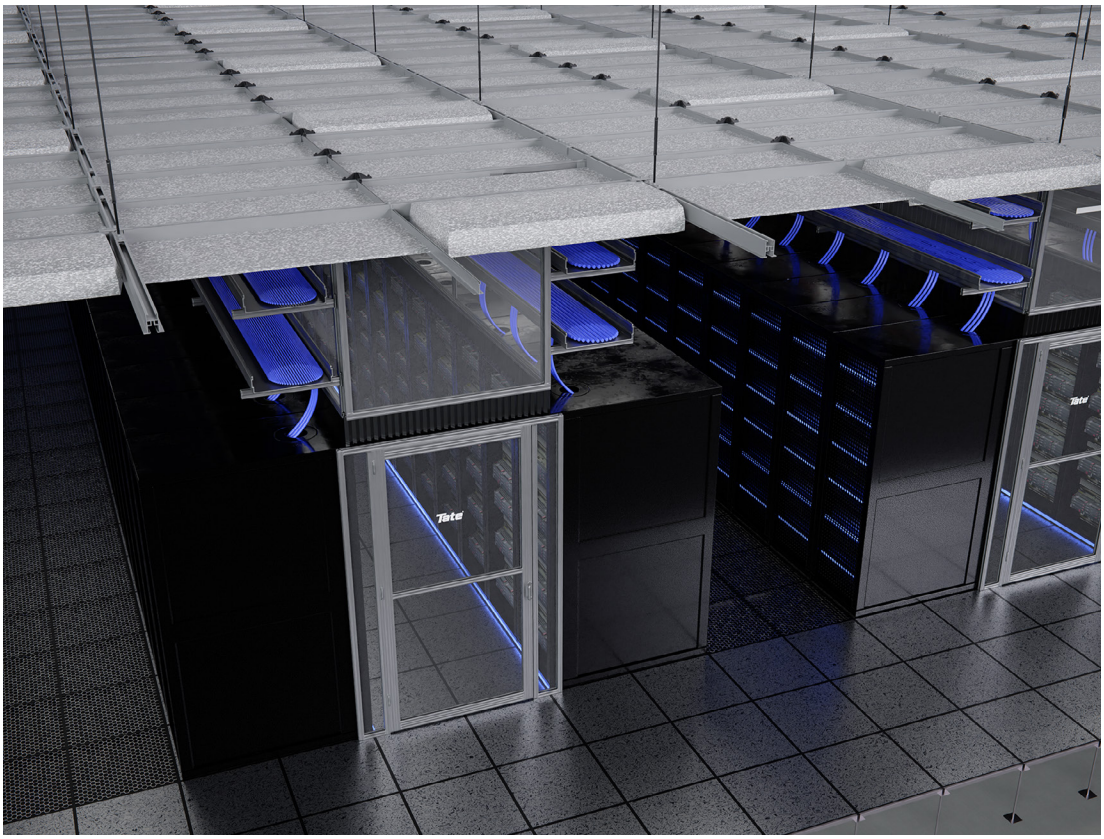
Tate Alustra User Installation Reference Guide



THIS INFORMATION MUST BE SHARED WITH ALL SERVICE PROVIDERS WHO INTEND TO SUSPEND SERVICES FROM THE TATE ALUSTRA SYSTEM

Download
Installation Guide

Safety Guidelines

THIS INFORMATION MUST BE SHARED WITH ALL SERVICE PROVIDERS WHO INTEND TO SUSPEND SERVICES FROM THE TATE ALUSTRA SYSTEM

Tate Alustra is a structural ceiling system designed to support static vertical loads. When installing services to the center 3/8"-16 threaded channel, the following instructions must be adhered to:

1. Tate Alustra is limited to a maximum point load of 380 lbs or distributed loads should not exceed the ratings noted in the loading charts on page 15.
   a. Exceeding these values may cause a failure in the system.

2. Do not torque the threaded rod or bolts above 30 in-lbs. Over torquing will damage the threads of the 3/8"-16 slot reducing the load capacity of the Tate Alustra System.
   a. Failure to adhere to this may result in the shearing of center slot threads reducing the load capacity of the Tate Alustra system.

3. Equal care must be taken during the installation of the Tate Alustra profile and the connecting bracket, spring nut and bolt.
   a. Failure to adhere to this may result in reducing the load capacity of the Tate Alustra system.

4. Only spring nuts and bolts supplied by Tate should be used on the top channel
   a. Failure to adhere to this may result in the reduction of the load capacity of the Tate Alustra system.

5. There must be at least 5/8 in. thread engagement between threaded rod or bolt supporting the suspended service(s).
   a. Failure to adhere to this may result in the reduction of the load capacity of the Tate Alustra system.

6. Do not impose a dynamic load on the connection to Tate Alustra. During installation of supported services, bracing is required to prevent dynamic load on the Tate Alustra ceiling
   a. Moment forces imposed on the Tate Alustra system may cause failure of the connection between the services and the Tate Alustra system.

7. Tate Alustra is NOT a walk-on ceiling.

8. In certain conditions the loading capacity of the Tate Structural Ceiling System may be greater than the loading capacity of the building structure and/or means of attachment to the building structure. Consult with a licensed structural engineer to obtain site specific recommendations regarding the attachment of the Tate Structural Ceiling System and any associated loading to the building structure.

9. Structural ceiling systems as a whole shall be analyzed and designed to local codes by a qualified engineer.

THIS INFORMATION MUST BE SHARED WITH ALL SERVICE PROVIDERS WHO INTEND TO SUSPEND SERVICES FROM THE TATE ALUSTRA SYSTEM

Introduction

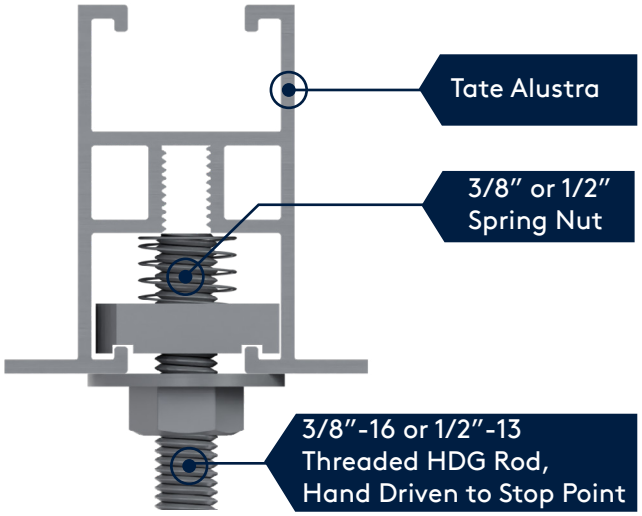
Thank you for choosing Tate Alustra. The purpose of this guide is to provide you with a reference for typical installation situations. We would be interested in hearing any comments you have on this installation manual, product, or overall experience. Please call or email Technical Services: Phone: 410-799-4200, Email: info@tateinc.com

Safety

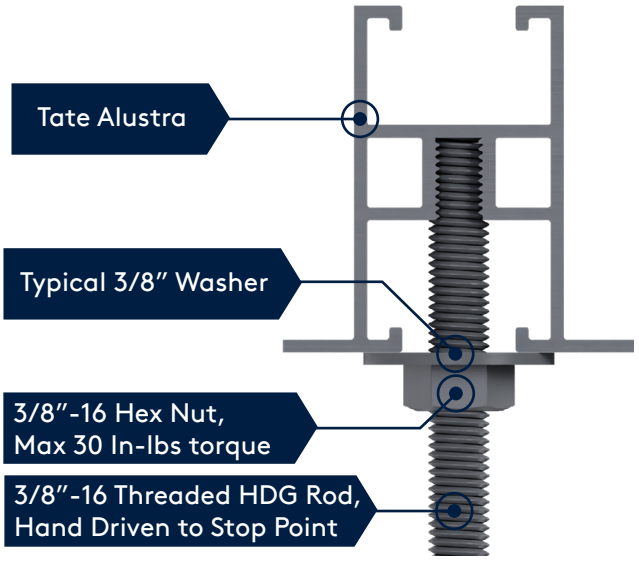
Tate Alustra is a structural ceiling system designed to support static vertical loads. When installing services to the center 3/8″-16 threaded channel, the following instructions must be adhered to:

1. Do not torque the threaded rod or bolts above 30 in-lb when using the direct connection method. Over torquing will damage the threads of the slot reducing the load capacity of the Tate Alustra system. Torque limits are not restrictive when hanging using a spring nut connection.
2. There must be at least 5/8″ thread engagement between threaded rod or bolt
3. Be sure all bolts, nuts, and threaded rods are properly tightened down as described in this guide.
4. Do not impose a dynamic load on the connection to Tate Alustra. During installation of supported services, bracing is required to prevent dynamic load on the Tate Alustra ceiling
5. All bottom thread fixings should be completed with suitable washers.
6. Do not put a load on the system until the installation is complete
7. Tate Alustra is NOT a walk-on ceiling
8. 2 or more people are required for handling some of the pieces for this system
9. Wear personal protective equipment (PPE) when drilling, cutting, or installing. PPE includes gloves, safety eyeglasses, hard hats, etc.

Spring Nut Connection Methodology



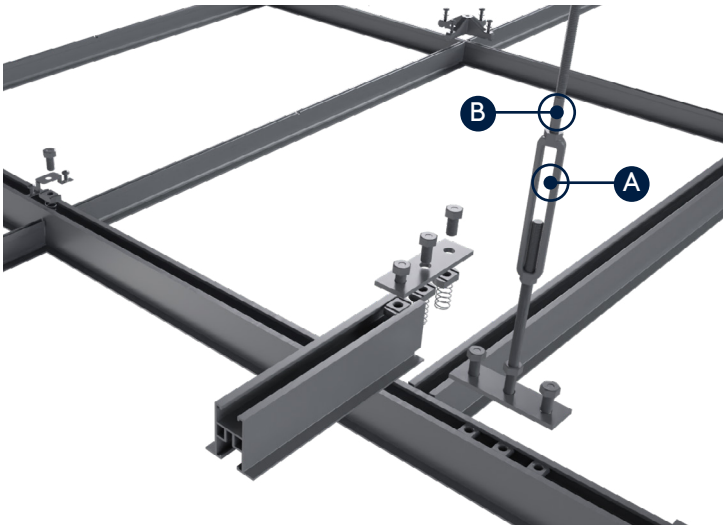
3/8″ Direct Connection Methodology



1. Building Connections

Tate Scope of Supply:

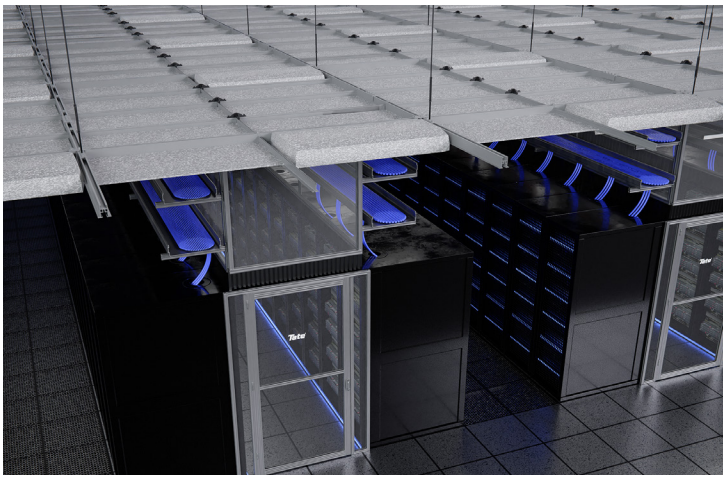
Tate supplies Alustra components up to the turnbuckle (A), suitable drop rod and building connections (B) must be sourced by others.



Tate Alustra hanging method from steel building

Tate Alustra hanging method from concrete building

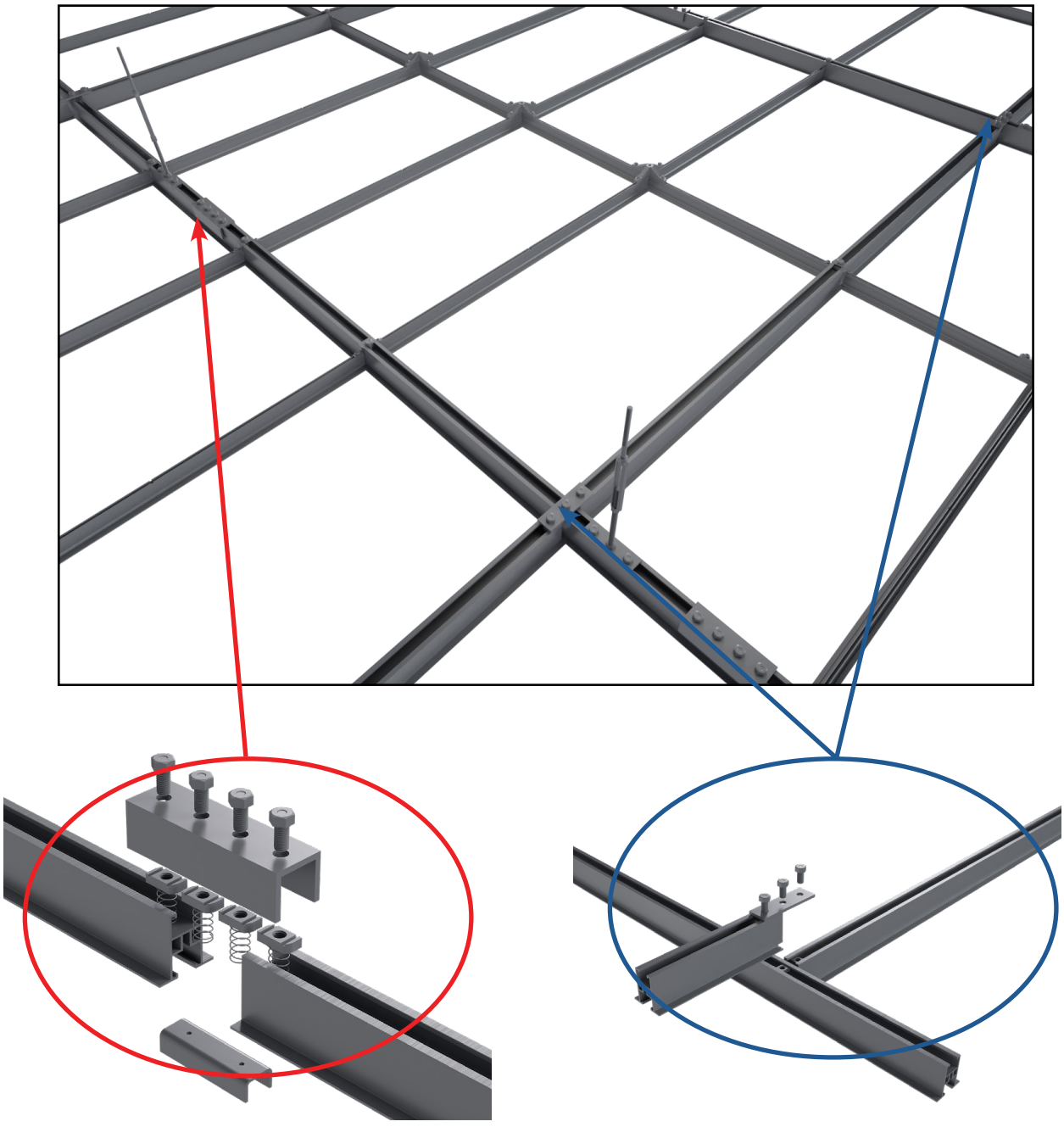
The Tate Alustra system may be hung either directly from structural steel or the above concrete slab.



Drop Rod Frequency:

Tate Alustra hanging frequency to the building structure can be variable as indicated by the architect or mechanical drawings. A hanger drop is required within 12" of the main splice connection.

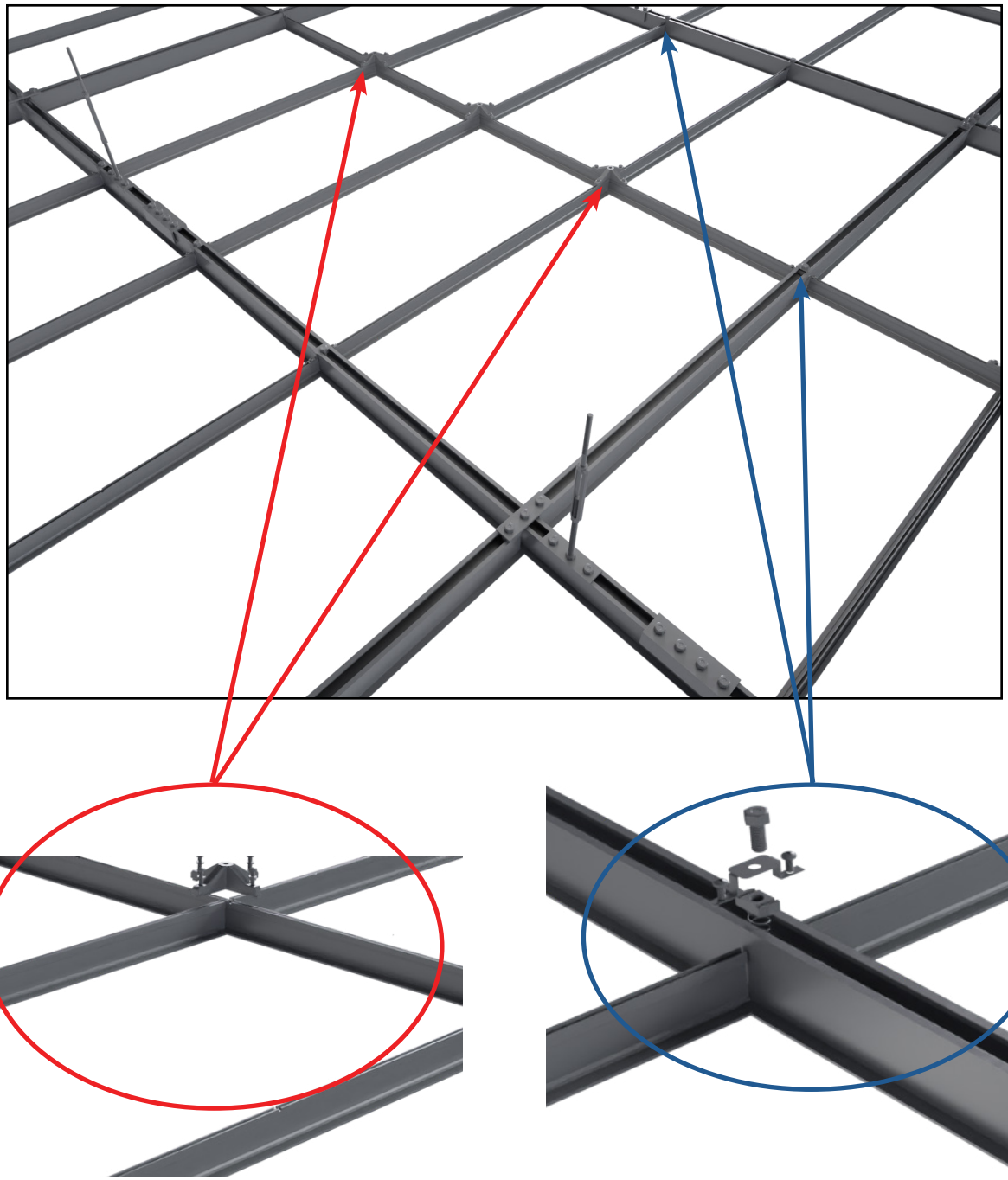
2. General Layout & Part Numbers



Main Runner Splice
Alustra Wrap Around Bracket (PN24244)
1/2"Spring Nut (PN24237)
1/2" - 13 x 7/8" Bolt (PN31845)
Splice Bracket (PN44323)
3/8"-16 Set Screw (PN27099)

Alustra Cross Tee Connection
3 Hole Straight Bracket (PN24242)
1/2"Spring Nut (PN24237)
1/2"-13 x 7/8" Bolt (PN31845)

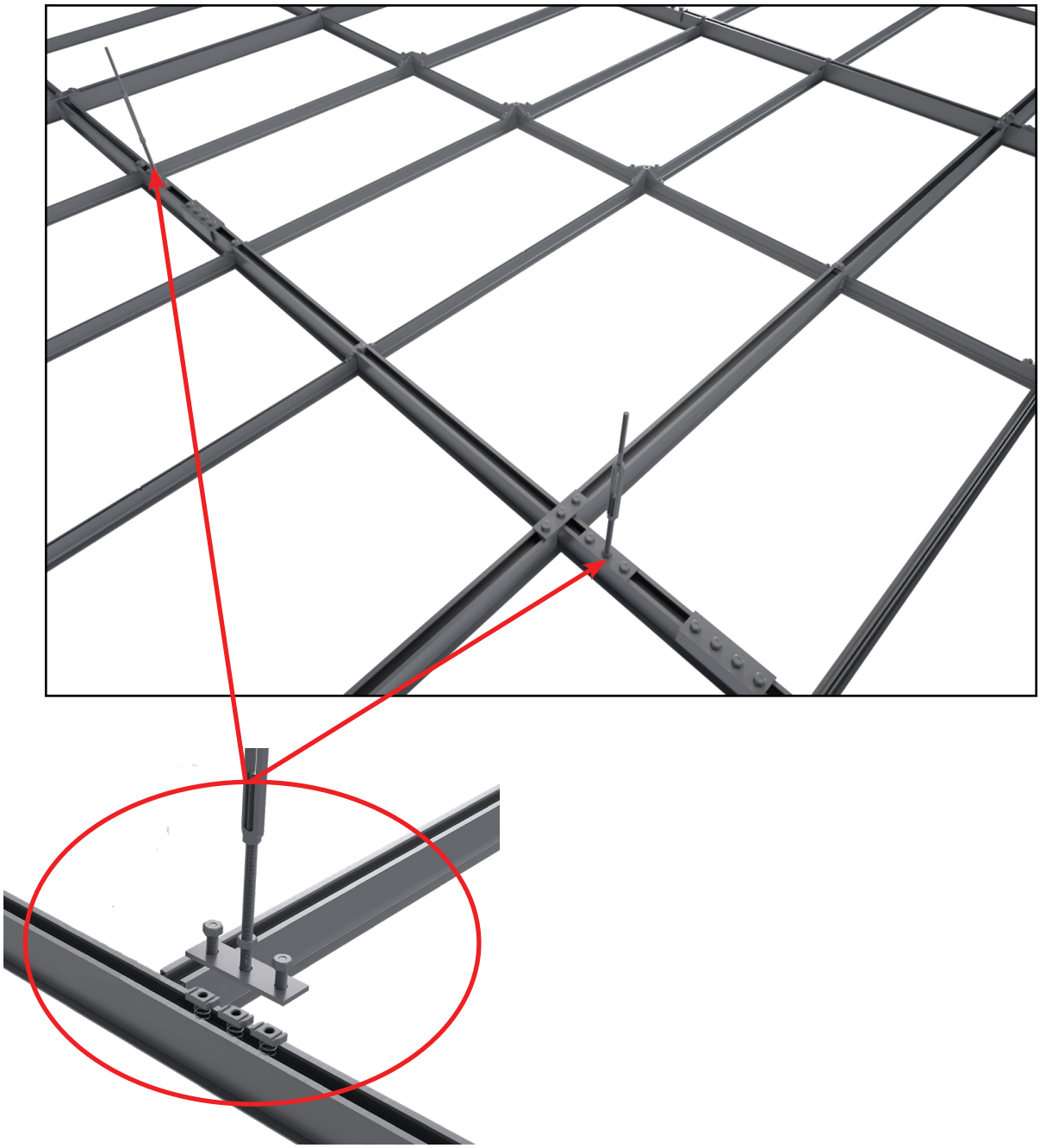
Light Structural Infill Connections



Light Structural Intersection
Field Connector (PN39553)
1/4" Bolts with 1/4" Washers (PN41788)

Light Structural to Alustra Connection
Light Structural Bridge Connector(PN44246)
1/2"Spring Nut (PN24237)
1/2" - 13 x 7/8" Bolt (PN31845)
1/4" Bolts with 1/4" Washers (PN41788)

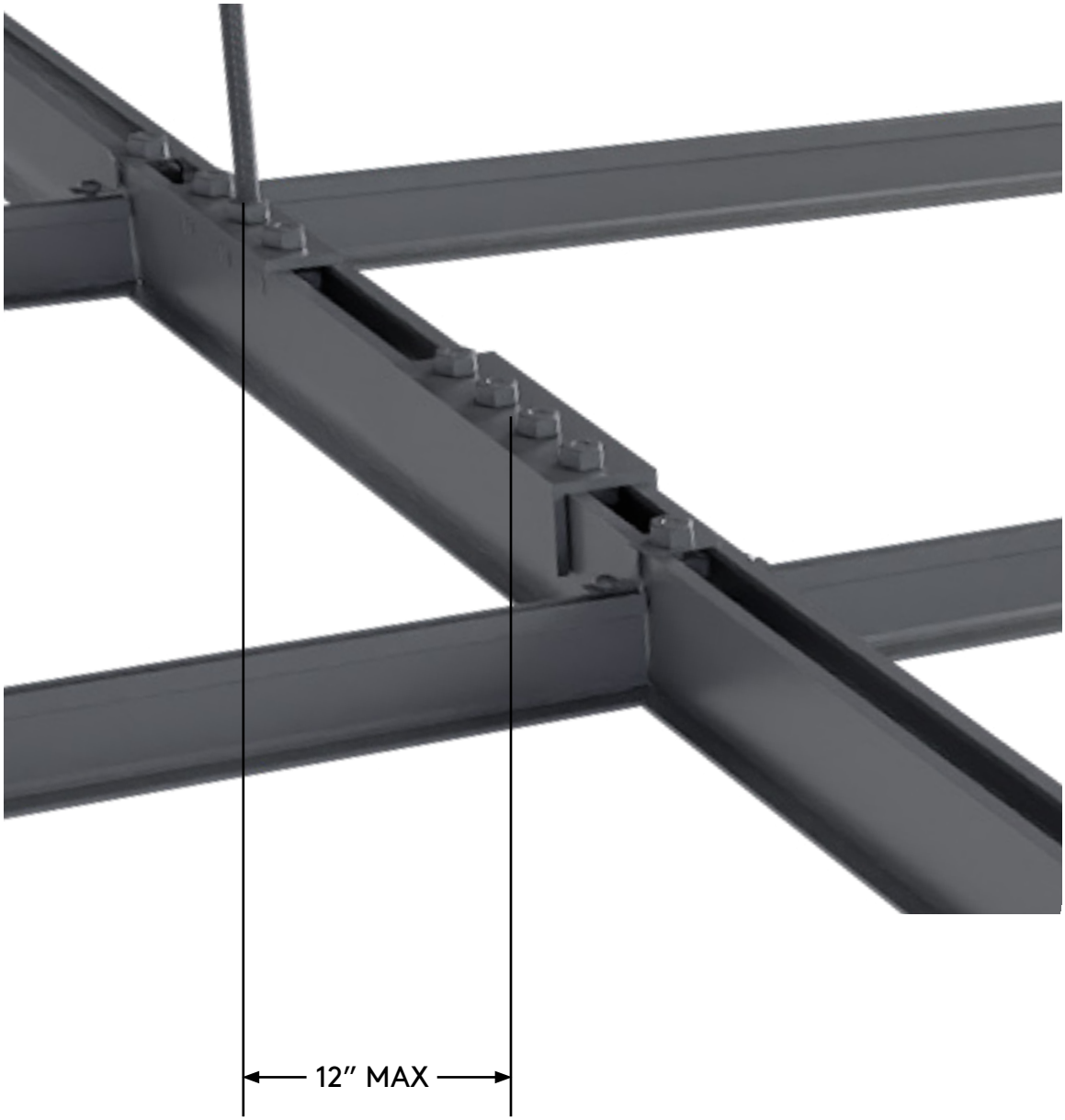
Threaded Rod and Starter Rod Connections



Hangers for Alustra Mains

½" Turnbuckle & Starter Rod (PN28814)
3 Hole Straight Bracket (PN24242)
1/2"-13 Hex Nut to lock all thread (PN41907)
Spring Nut (PN24311)
1/2" - 13 x 7/8" Bolt (PN31845)

Splice to Hanger Spacing



Maximum distance the turnbuckle can be from the joint of two Mains.

4. Notch Details

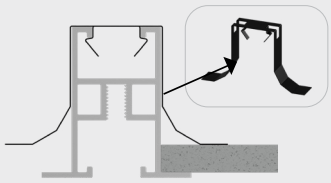
Light Structural Infill Notches

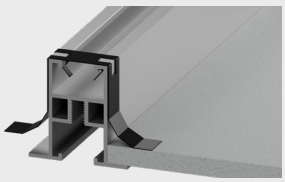
All Light Structural Infill Tees are notched every 24" on center for proper alignment and spacing of the connectors.

For 2'x2' Alustra systems, the 4' tees should first be installed between the main runners and oriented such that the witness notches at the ends of the 4' tees are all oriented in the same direction. This will ensure that the 2' tees will align properly and parallel to the mains.

HOLD DOWN CLIPS

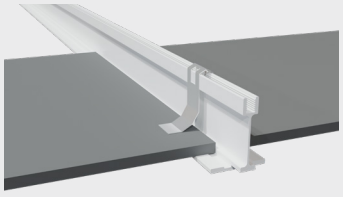
- Hold down clips can be provided with the Tate Alustra system as an option.
- Two hold down clips are recommended per tile.
- Hold down clips are installed by pressing them into the top thread by hand or lightly tapping them with a mallet.
- Hold down clips are designed for use with 1/2" - 1" thick ceiling tiles
- PN44406

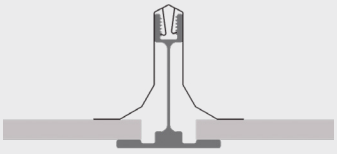


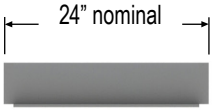


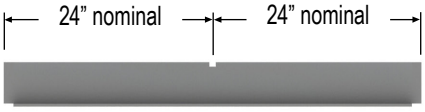
LIGHT STRUCTURAL PROFILE CLIPS

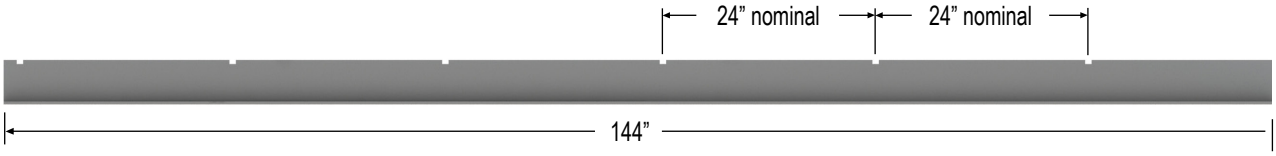
- Hold down clips can be provided with the Tate Grid system as an option.
- Two hold down clips are recommended per tile.
- Hold down clips are installed by pressing them into the top thread by hand or lightly tapping them with a mallet.
- Hold down clips are designed for use with 1/2" - 1" thick ceiling tiles
- PN44403











24" & 48" Structural Tees have coped ends which allow the Alustra to rest on the longer sections for stronger connections.

48" Structural Tees and 12' Main Runners are notched every 24" on center for proper alignment and spacing of the connectors.

Note: Structural Tee and Main Runner dimensions are nominal and are adjusted for custom-sized ceiling Alustra designs.

5. Perimeter Details

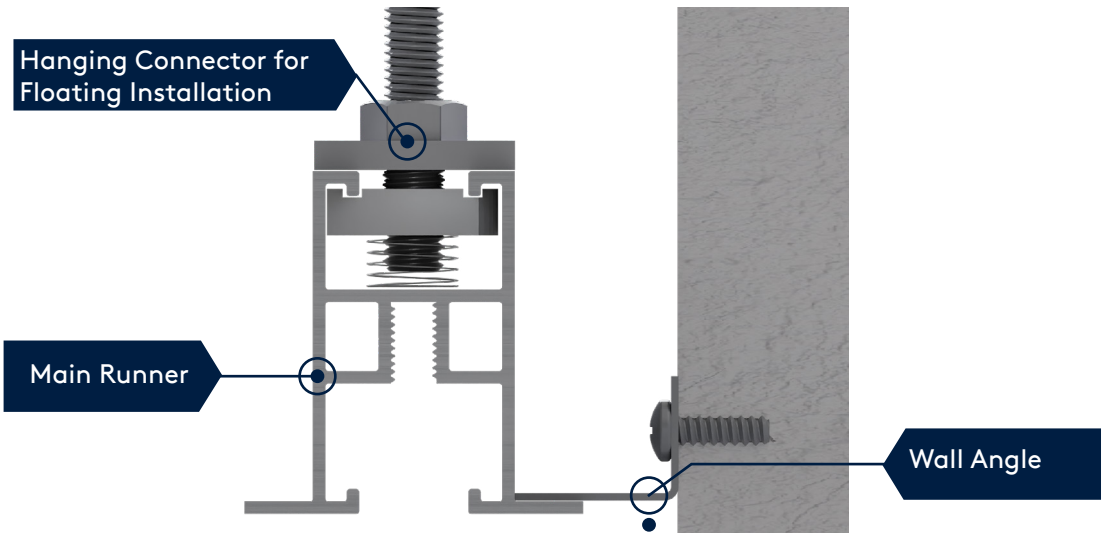
Perimeter Options:

The Tate profile should run along all perimeters and should be anchored every 4'. This serves multiple purposes:

- An engineering purpose as it ensures no part of the system is cantilevered.
- It also has aesthetic and air sealing benefits as the tiles sit better in this design.

If this design is not followed, the members of Tate Alustra terminating at the wall may not be structurally sound and may deflect and fail under load.

Tate Alustra should be installed at the perimeter of a data hall using a floating perimeter. Floating perimeters utilize standard Main Runner components which can also be used in other areas of the data hall.



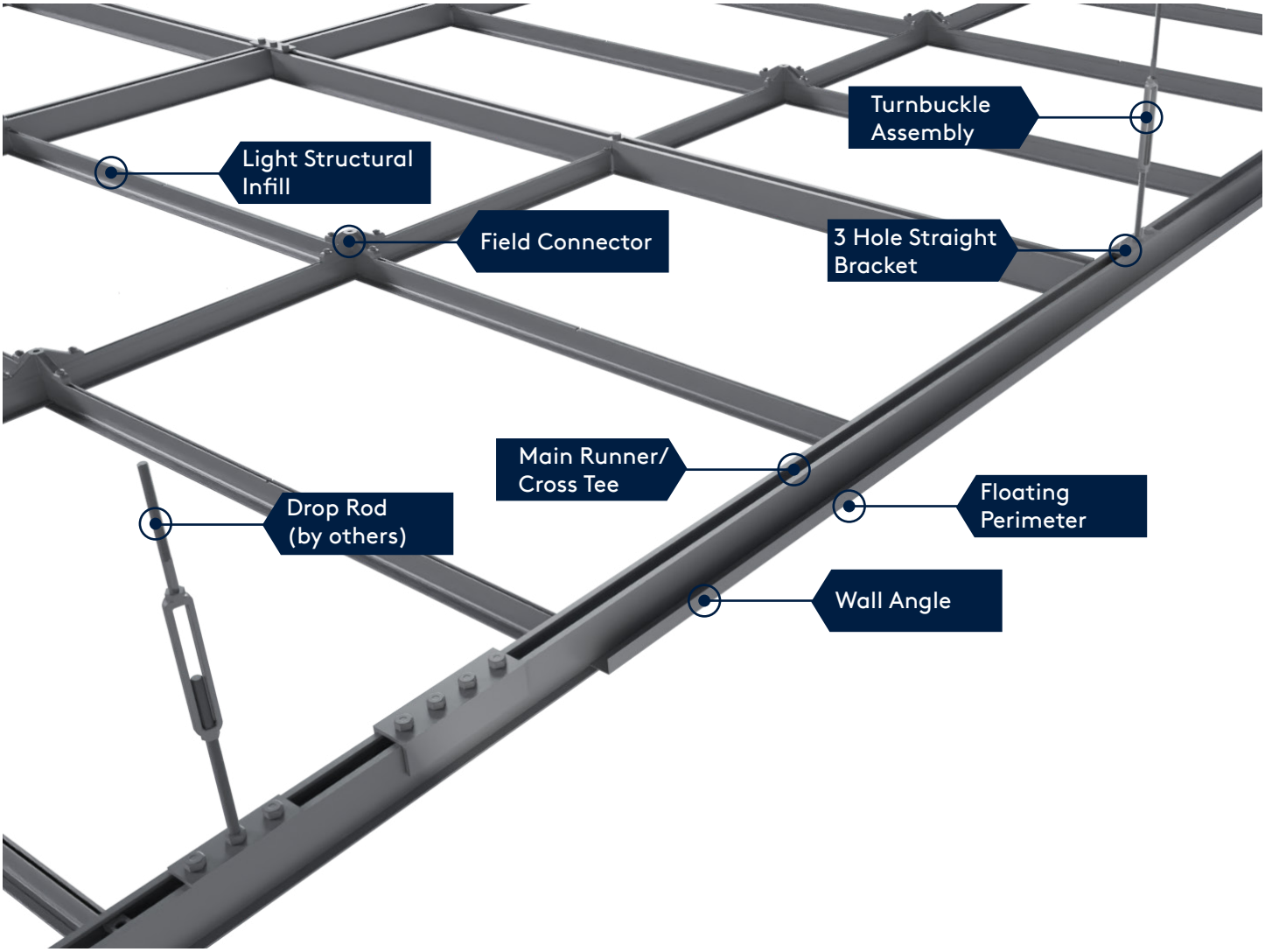
Floating Installation Detail

Main Runners are utilized when installing with a floating detail. When installing with a floating perimeter.

Additionally it is recommended to utilize a Wall Angle attached to the perimeter.

5. Perimeter Details

Standard Floating Perimeter Detail



6. Ceiling Assembly

Bolt Torque

All bolt or nut connections to the center slot of the Alustra should be tightened flush to a washer or mounting bracket with a **maximum torque value of 30 in-lb**, using a torque limiting screw gun or wrench similar to:

Thread Engagement

When threading bolts or threaded rod into bottom slot to hang equipment, ensure that the bolt or rod is long enough to fully engage the depth of the slot entirely or thread tear-out could be possible. Any less than 75% (5/8") engagement could cause thread tear-out at less than rated loads for the system.

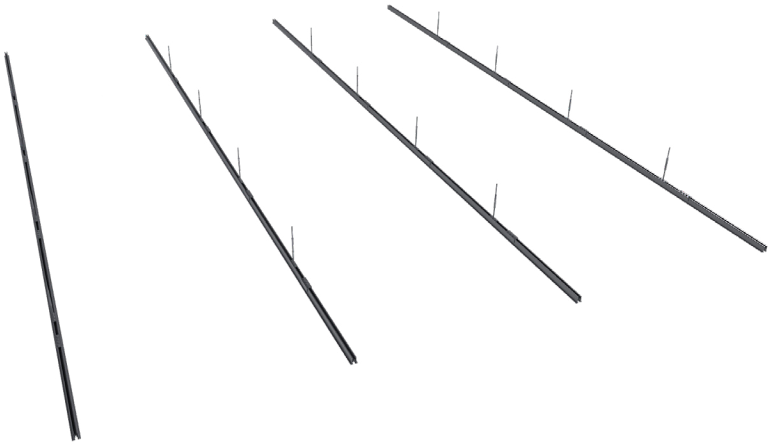
Field Alustra Assembly

While Tate Alustra can be customized to meet the needs of your specific application, the following example is based on 2′ x 4′ Alustra spacing with turnbuckle connections on 8′ x 4′ centers.

Step 1

Install Main Runners

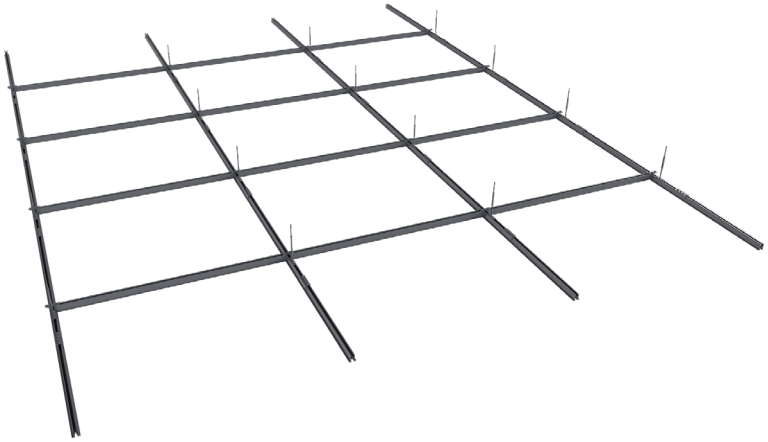
The Mains are equally spaced. All hangers and turnbuckles are placed every 8′ along the mains to connect them to the building structure. Hangers for Alustra are used along the Mains and the connection point between two adjoining Mains require 3 hole connectors.



Step 2

Install Structural Tees

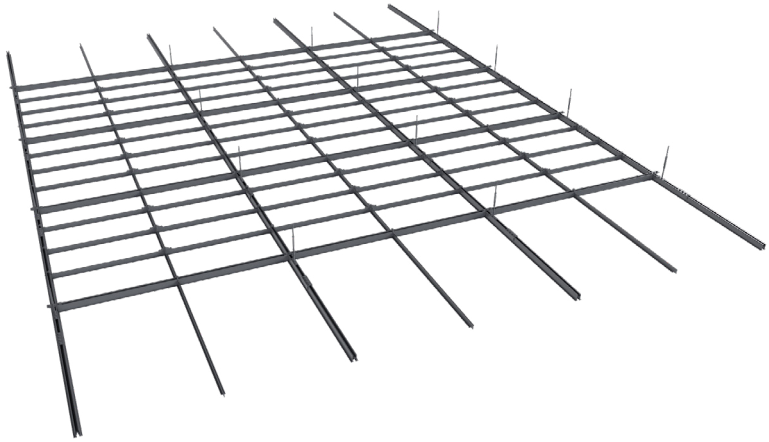
The Structural Tees are placed every 8′ along the Mains. The Tee's are factory coped on each end so that they rest on top of the Mains. Structural Tees are attached to the Mains by using 3 hole connectors.



Step 3

Install Light Structural Infill Tees

These Light Structural Infill Tees connect to the Mains using Light Structural to Alustra Connectors. Light Structural Tee are connected to each other using field connectors.



7. Service Conditions

Connecting to the center slot of the Alustra:

A standard 3/8"-16 threaded rod can be used to suspend services from the 3/8"-16 bottom slot of the Alustra. Fixings to the center slot of the Alustra must be at least 75% engaged, or to a depth of at least 5/8".

Center Slot Torque:

30 in-lb max, See Section 6 for details

Hot Aisle Containment:

Hot Aisle Containment components supplied by Tate can easily be secured to the center slot of the Alustra.

Cable Installation & Bracing Drops:

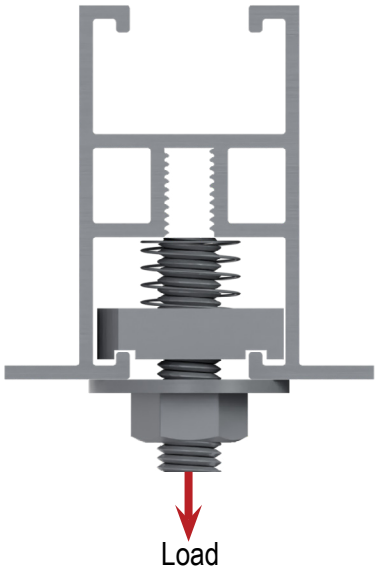
Do not pull cables or expose the Alustra to any dynamic loading. Dynamic loads and dragging cables across the Alustra may exceed the Ultimate Load of the Alustra.

To distribute a load that would otherwise exceed the stated 1,000 lb point load, cable ladders can be employed to achieve distributed loads up to the ratings noted in the loading charts on page 15. The example to the right shows the recommended method to distribute load so as to ensure no single 3/8" stud exceeds the 1,000 lb point load.

Please note: Bracing is required during cable pull. The installer should use a bracing method to hold the ladder racks in position so when cables are pulled during install the ladder does not swing back or forth. Bracing must be strictly adhered to in order to avoid exceeding the stated system load tolerances.

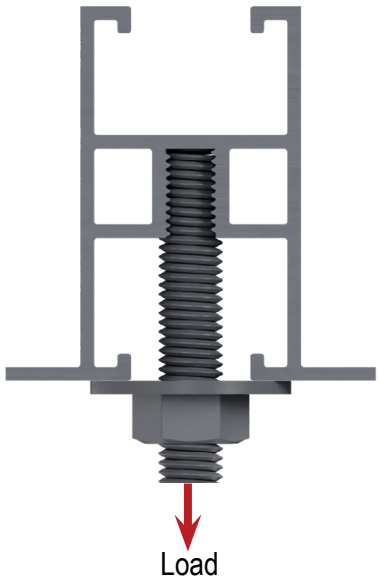
Performance Criteria

The following load capacities must be strictly observed when installing services from the Tate Alustra.



Bottom Channel Spring Nut Connection Performance Criteria				
On center Hanger Spacing	Max Uniform Load (lbs/SF)	Max Safe Working Load (Point Load) (lbs)	Mid Span Deflection at Max Safe Working Load (in)	Safety Factor
4x4	156	1000	0.515”	2x
5x4	125	800	0.760”	2x
6x4	104	700	0.867”	2x
7x4	89	500	0.857”	2x
8x4	78	300	0.90”	2x
6x6	69	700	0.867”	2x
8x6	52	300	0.90”	2x
8x8	39	300	0.90”	2x

1. The combined loading of the center channel and bottom channel cannot exceed the loading in the chart above.
2. Hanging locations are to be no less than the length of the strut span in any given direction
3. Maximum point loads are limited by the turnbuckle connections to strut. Turnbuckles are required to be within 12” of a Main Runner Splice
4. All loads provide for a minimum safety factor of 2.



Threaded Center Slot Performance Criteria				
On-Center Hanger Spacing	Max Uniform Load (lbs/SF)	Max Safe Working Load (Point Load) (lbs)	Mid Span Deflection at Max Safe Working Load (in)	Safety Factor
4x4	156	380	0.20"	2x
5x4	125	380	0.32"	2x
6x4	104	380	0.50"	2x
7x4	89	380	0.635"	2x
8x4	78	300	0.657"	2x
6x6	69	380	0.50"	2x
8x6	52	300	0.657"	2x
8x8	39	300	0.657"	2x

1. Hanging locations are to be no less than the length of the strut span in any given direction
2. Maximum point loads are limited by the turnbuckle connections to strut. Turnbuckles are required to be within 12” of a Main Runner Splice
3. All loads provide for a minimum safety factor of 2.

L (Span between Supports) = in
E (Modulus of Elasticity) = 1.00*10^6 lbs/in^2
I (Moment of Inertia) = 0.817 in^4
D (Deflection) = PL^3/48EI

ULF (Uniform Load/LF) = P/(L/12x2)
USF (Uniform Load/SF) = P/(L/12)^2

8. Maintenance

Cleaning:

To clean Tate Alustra components please use a common non-abrasive mild detergent containing less than 0.5% phosphate and water, applied using a sponge. The components should be dried using a soft towel. If solvents are required to remove materials not soluble in water such as petroleum products, the following solvents can be used: Isotropy alcohol, denatured alcohol, mineral spirits or methanol. Paint scratches can be touched up. Contact the factory for matching paint.

Maintenance of above ceiling services:

The Tate Alustra system should not be walked on under any circumstances. This may expose the system to excess dynamic loads and cause a failure.

Ceiling tiles may be removed to build a scaffold like structure that rises through the Alustra and can allow walk-on access above the Alustra without exposing the Alustra system to extra loads.

Corporate Headquarters:

7510 Montevideo Road,
Jessup, MD 20794
Tate Hotline: 1-800-231-7788
Tel: +1 410 799 4200
Fax: +1 410 799 4207

Production Facilities:

7510 Montevideo Road,
Jessup, MD 20794

52 Springvale Road,
Red Lion, PA 17356
Tel: +1 717 244 4071
Fax: +1 717 246 3437

Canadian Sales & Support Office:

5050 South Service Road Unit 201,
Burlington, ON L7L 5L4 Canada
Tate Hotline: 1-800-231-7788
Tel: +1 905 847 0138
Fax: +1 905 847 0141

Central and South American Sales & Support:

Tel: +1 954 412 2334

Asia Sales & Support Office:

1 Commonwealth
#07-26 One Commonwealth,
Singapore 149544
Tel: +65 6264 5942

Australian Sales & Support Office:

3 Herbert Place, Smithfield NSW 2164,
Sydney, Australia
Tel: +61 2 9612 2300
Fax: +61 2 9612 2301

European Sales & Support:

EDI House, Kylemore Park West,
Ballyfermot,
Dublin 10, D10 KH30 Ireland
Tel: +353 (1) 685 6518

Middle East Sales & Support:

Jebel Ali-Lahbab Road (E 77 Road),
Dubai Investment Park,
United Arab Emirates
Tel: +971 56 199 8368

A Kingspan Group Company

Kingspan

LRQA CERTIFIED ISO 9001

LRQA CERTIFIED

ZERO WASTE TO LANDFILL

CAGBC

USGBC MEMBER

EPA GREEN POWER PARTNER

Tate components are proudly made in the U.S.A.

Tate®