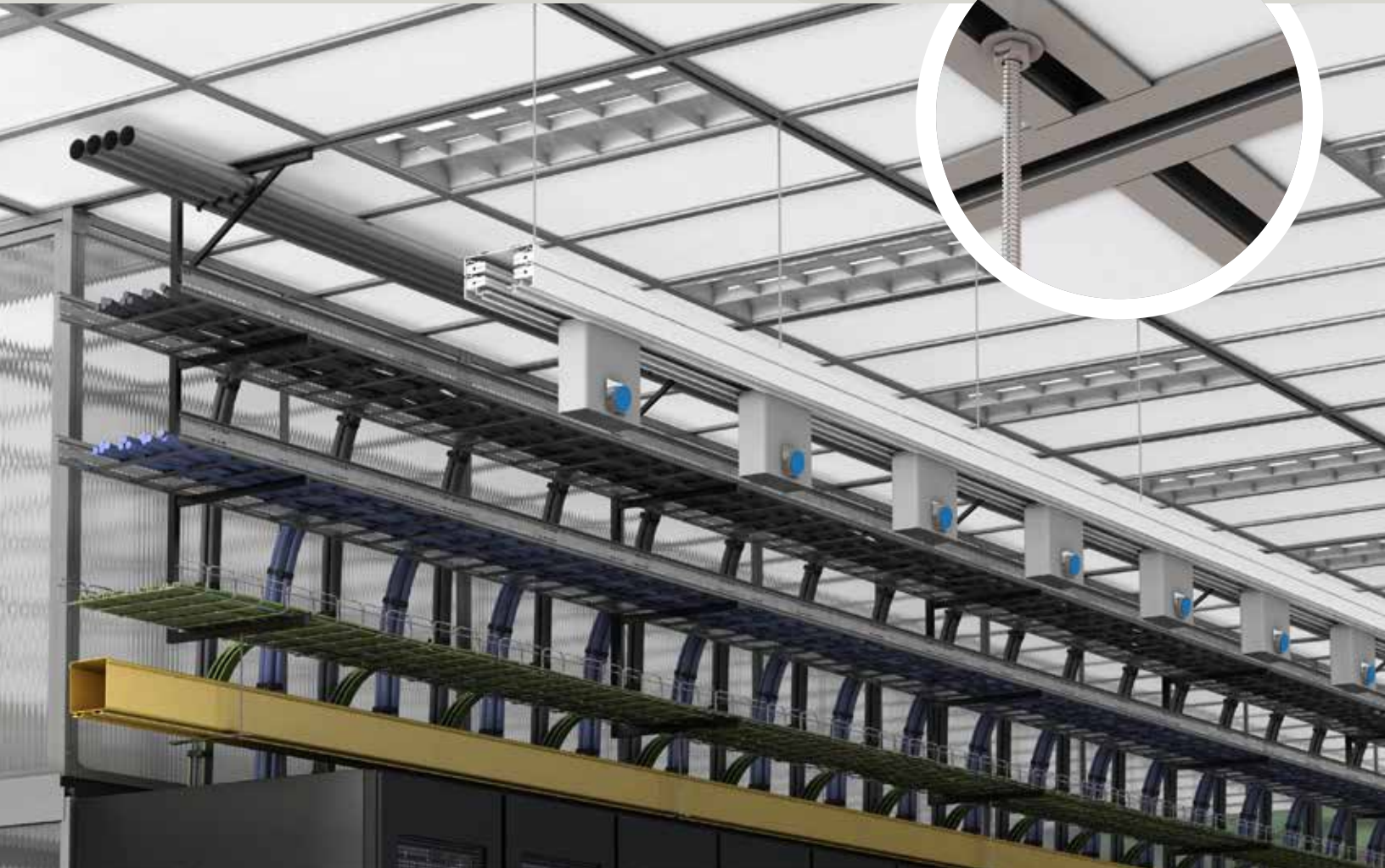


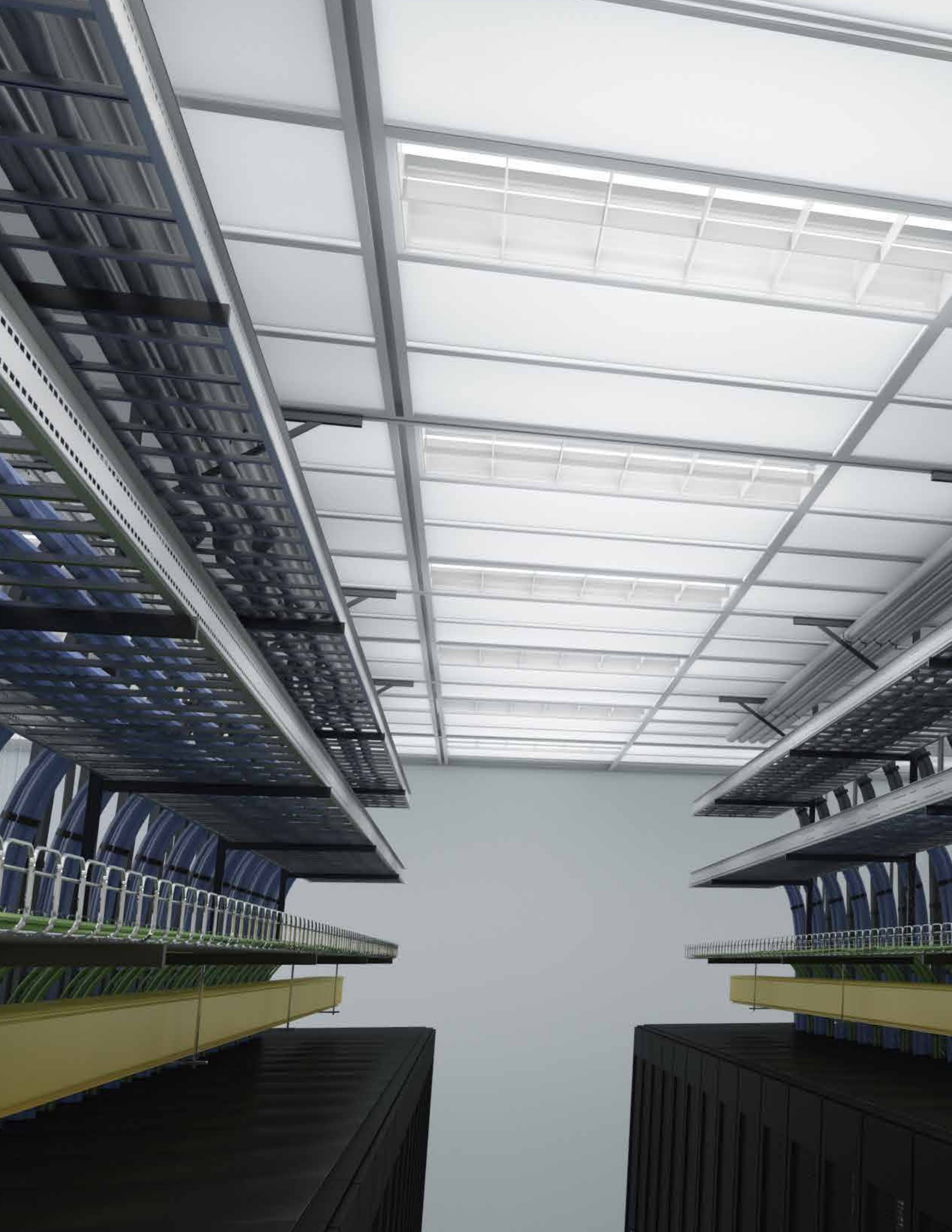
Tate Strut

Steel Structural Ceiling Grid System for Data Centers

Imperial Edition



Tate[®]





Tate Strut

Steel Structural Ceiling Grid System for Data Centers

Tate Strut is the ideal solution for any application where large, heavy items are suspended within a building. Tate Strut allows you to combine the acoustical ceiling grid with the structural support grid (such as Unistrut) for one cohesive unit.

Benefits of Tate Strut:

- Heavy load capacity: 1750 lbs Max Point Load
- Faster and easier to install than other grid systems
- Grid member center-to-center spacing can be selected to accommodate your specific project needs
- Eliminates the need for multiple trades on-site
- Experienced data center product manufacturer and contracting teams

Leverage our Experience

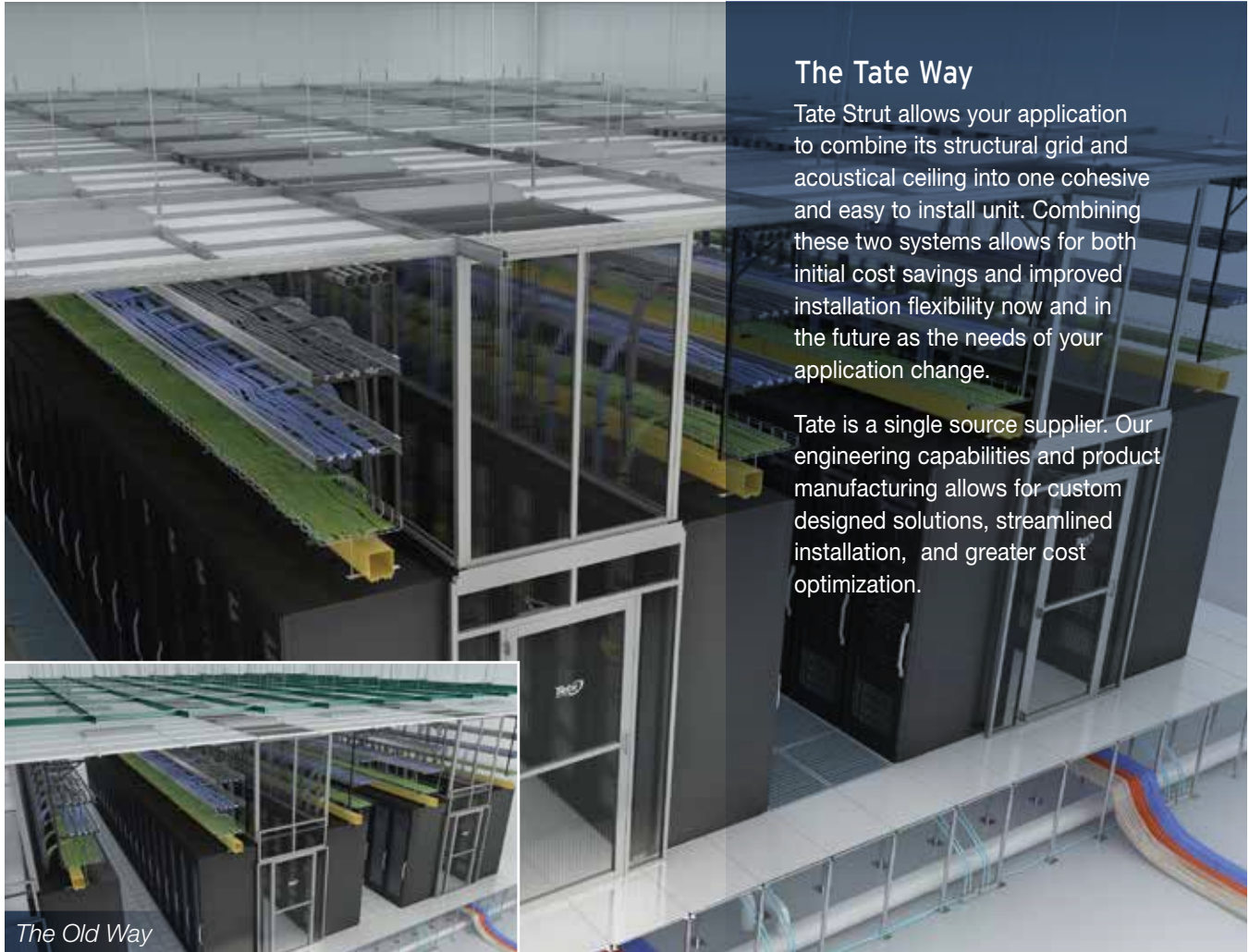
Tate offers over 50 years in data center support to your project. Our extensive dealer network of experienced contractors can rapidly support all the needs of your project including the structural ceiling, raised floor, and containment solutions.

Tate Offers:

- Application engineering team
- Custom manufacturing capability
- Skilled installation labor
- Single source to speed construction

Tate Strut

An Innovative Approach to Structural Support Systems



The Tate Way

Tate Strut allows your application to combine its structural grid and acoustical ceiling into one cohesive and easy to install unit. Combining these two systems allows for both initial cost savings and improved installation flexibility now and in the future as the needs of your application change.

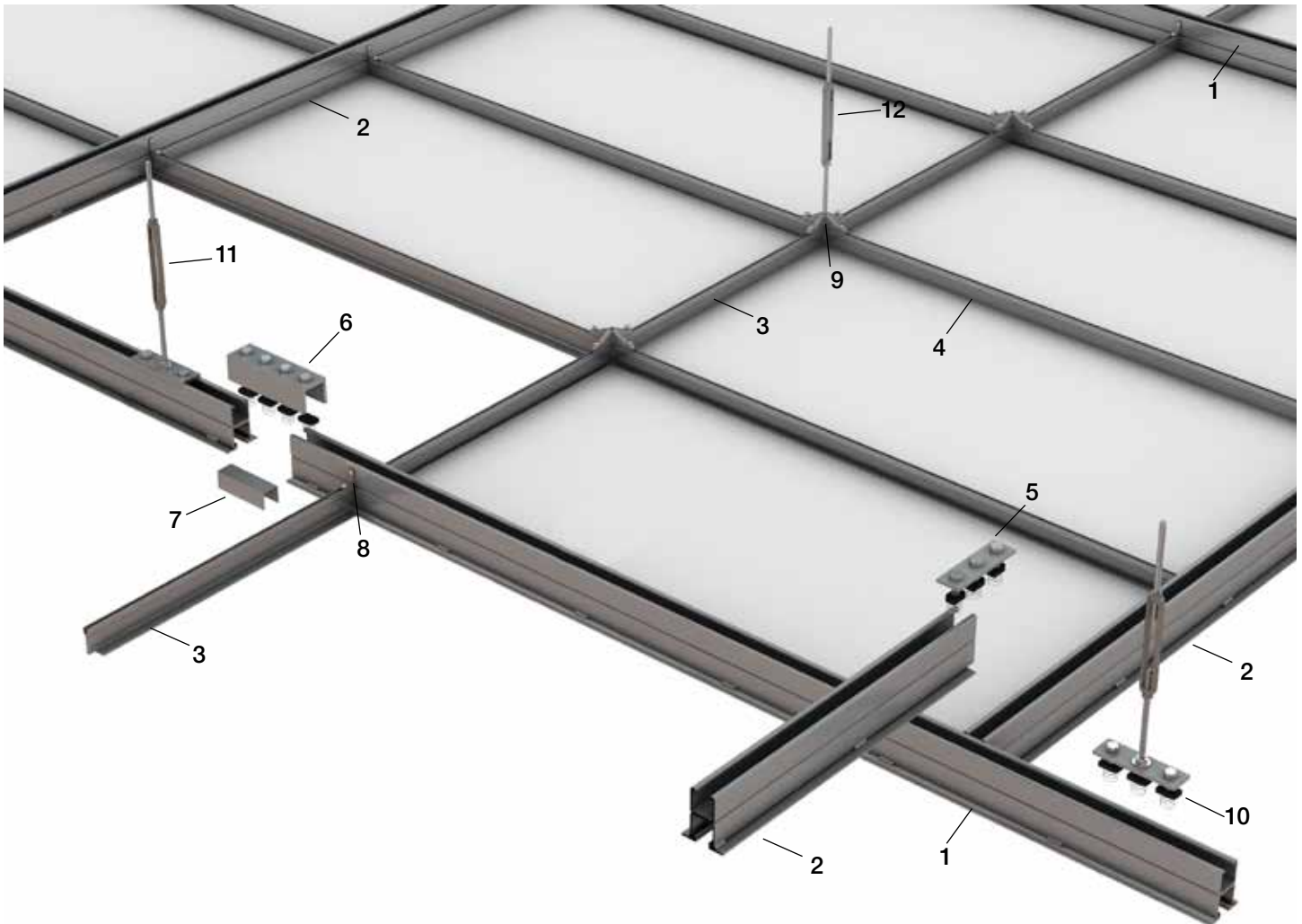
Tate is a single source supplier. Our engineering capabilities and product manufacturing allows for custom designed solutions, streamlined installation, and greater cost optimization.

Customized Manufacturing

The key to the speed of installation and cost optimization is Tate's unparalleled in-house manufacturing capabilities. No two applications are the same. Engineering and understanding of your specific application needs are done in advance and Tate's manufacturing process allows for all customization to be complete in the factory. Tate Strut is delivered with all components ready for installation, with no need for field fabrications — making installation less expensive and faster to install.



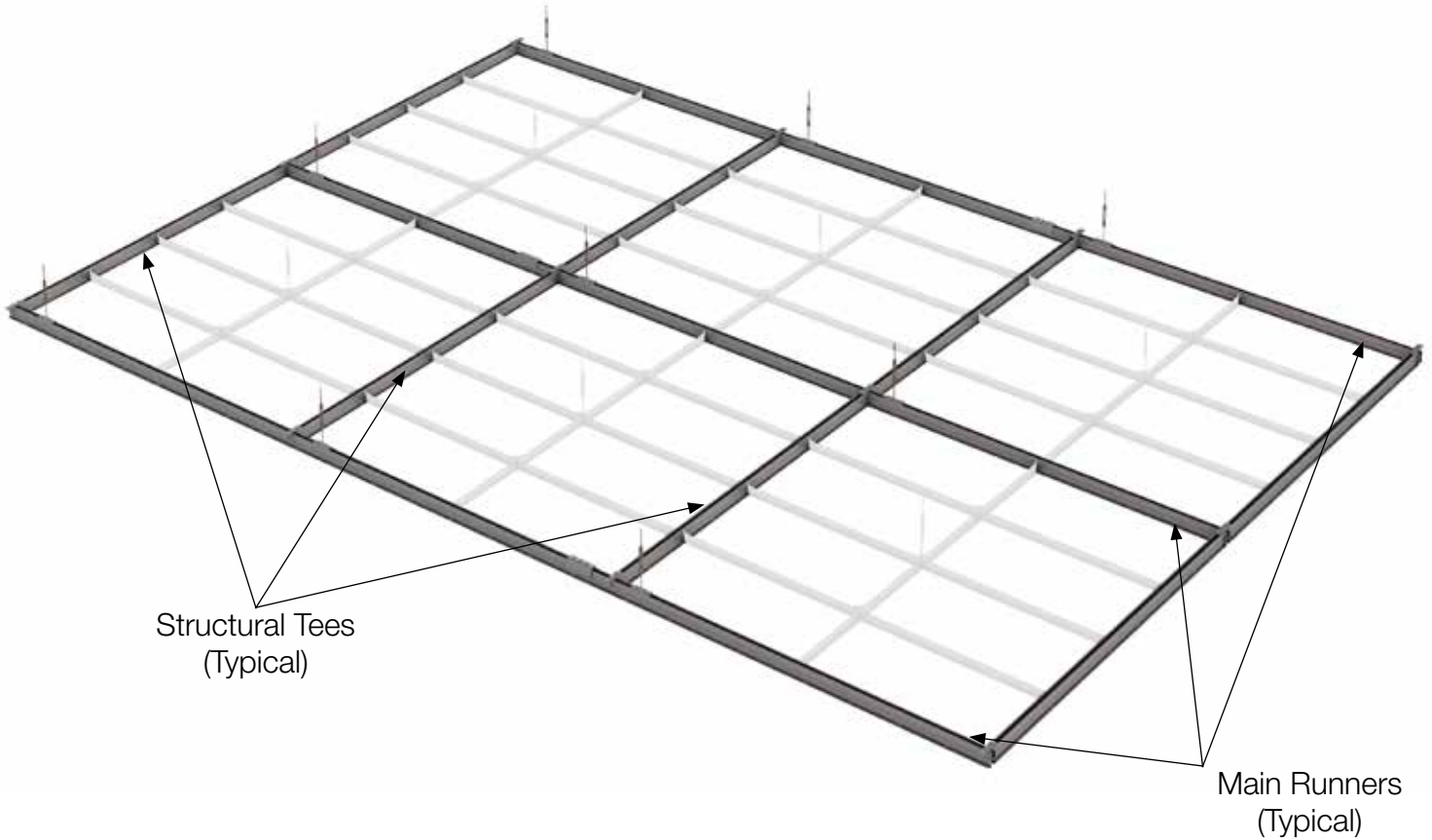
System Design



Tate Strut Component List

1. Steel Strut Main Runner
2. Steel Strut Structural Tees
3. Light Structural Main Runner
4. Light Structural Infill Tees
5. Strut Straight Connectors
6. U-Shaped Strut Connector
7. Internal Splice Support Connector
8. Light Structural L-Angle Connector
9. Light Structural Field Connector
10. 1/2"-13 Channel Nut with Spring
11. 1/2"-13 x 7.85" lg Turnbuckle Assembly
12. 3/8"-16 x 7" Turnbuckle Assembly

Tate Strut Main Runners & Structural Tees



Tate Strut

Tate Strut is a strong, galvanized steel profile with a white painted finish. Uniquely integrated welded flanges support tiles, light fixtures, and return air grilles — removing the need for two separate ceiling systems. The continuous open channel slot allows for full flexibility when suspending cable trays, bus bars, and other heavy accessories from the structural ceiling. Both Strut Main Runners and Structural Tees are pre-drilled for infill connections based upon application specifications.

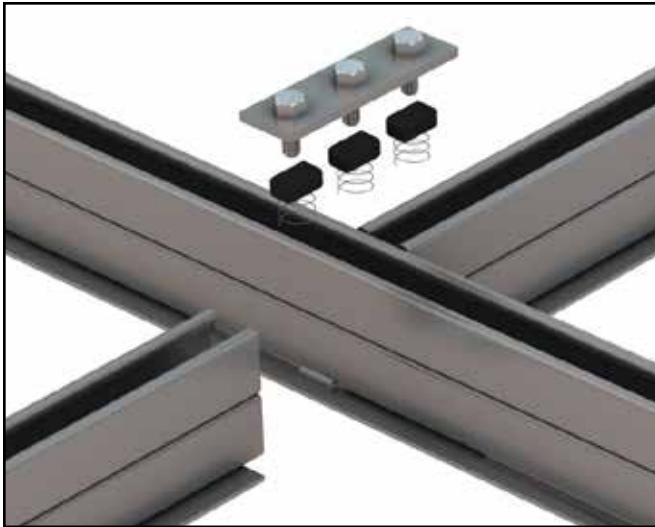
Main Runners

Tate Strut's Main Runners are designed to span a variety of lengths without losing structural integrity. As the backbone of the structural ceiling grid, Main Runners can be spliced together as needed for full customization and to ensure coverage of any application. Main Runners are generally ran perpendicular to the building's structural beams.

Structural Tees

Structural Tees are used to complete the perpendicular grid components in Tate Strut. Structural Tees are designed with coped flanges that simplifies and accelerates installation.

Tate Strut Components

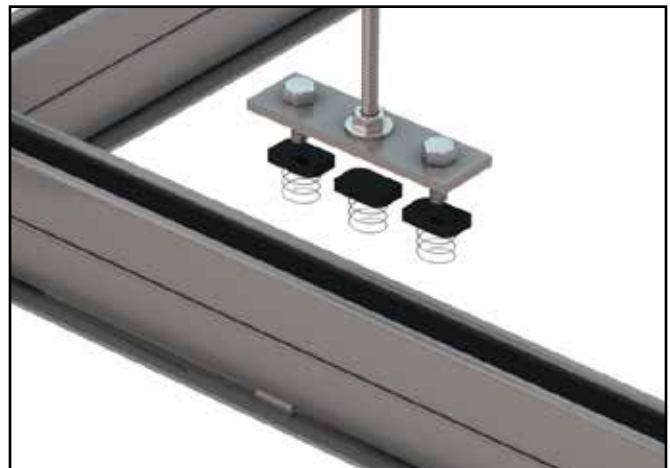


Tate Strut Intersections

- Simplistic Straight Connectors are used to connect Main Runners and Structural Tees with ease
- Straight Connectors are easily attached to Strut with Channel Nuts and Hex Bolts
- Straight Connectors provide excellent tension support for intersections while the coped Structural Tees simplifies and accelerates installation

Connection to Building Structure

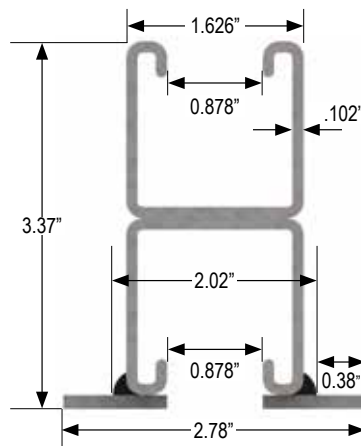
- 1/2"-13 x 7.85" lg Turnbuckles are connected with the use of the Straight Connectors
- Turnbuckle locations can easily be adjusted to your application needs
- Straight Connectors are easily attached to Strut with Channel Nuts and Hex Bolts



Features

- 12 gauge steel construction
- Hot dipped galvanized pretreatment with a white power coat finish
- Continuous open top slot to accommodate connection to building structure
- Continuous open bottom slot to accommodate connections of cable trays, bus bars, and other heavy accessories
- Welded flange to accommodate ceiling tiles, lights and return grills

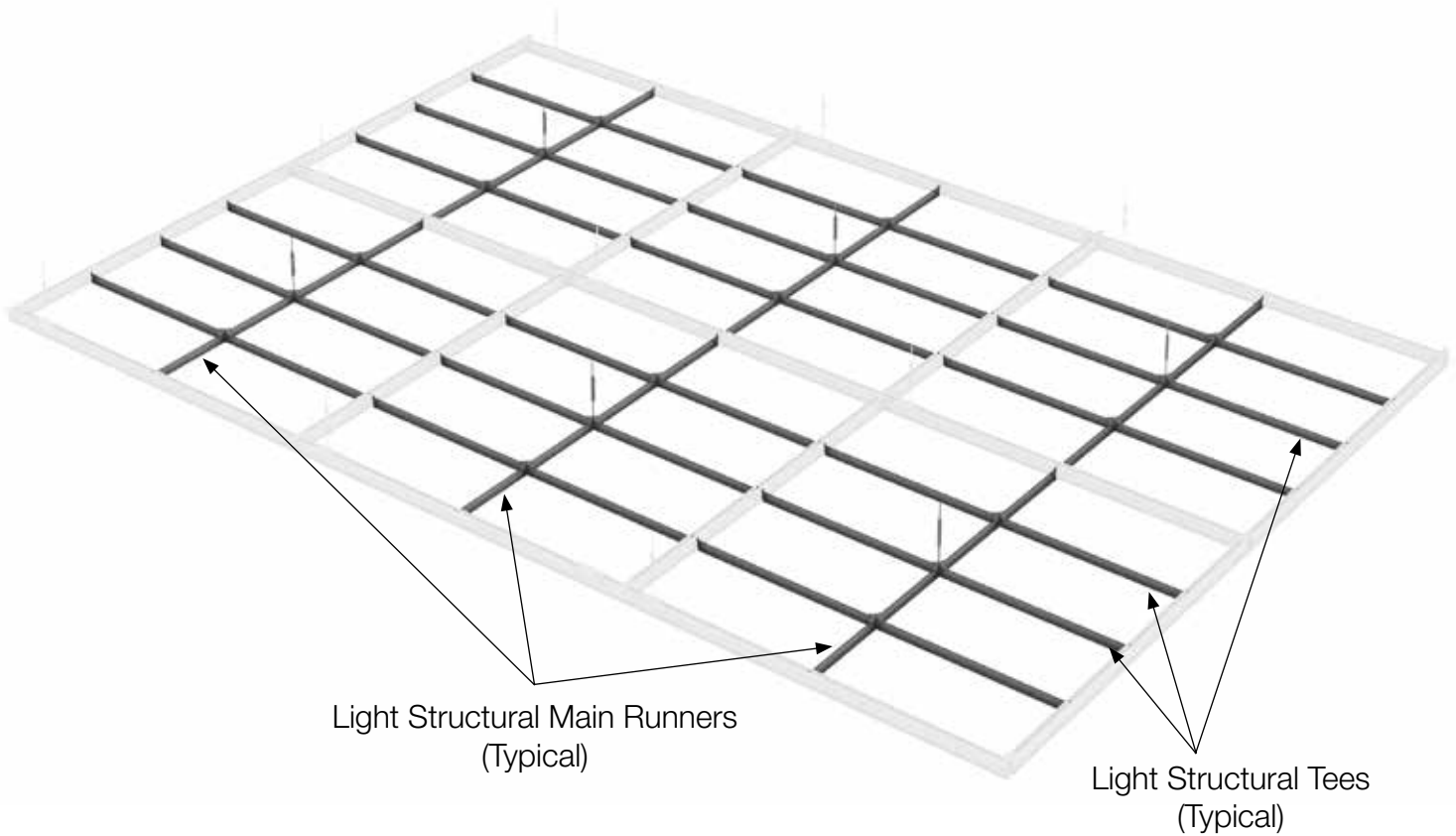
Tate Strut Profile



Structural Tee Coping Detail



Light Structural Infill Main Runners & Structural Tees



Light Structural Infill

The Light Structural Infill is comprised of an extruded aluminum profile with a painted white finish. It is used to fill the customized ceiling grid to the proper sizing needed. The Light Structural Infill contains a continuously threaded $\frac{1}{4}$ "-20 top slot for connecting to the steel strut profile, connecting Main Runners and Tees, and for additional support with a $\frac{3}{8}$ "-16 x 7" lg Turnbuckle assembly. The flanges support tiles, light fixtures, and return air grilles as needed.

Light Structural Infill Main Runners and Tees

With coped ends for optimized structural continuity, the Structural Infill Main Runners are able to abut the Strut profiles and attach to the pre-drilled strut profile with $\frac{1}{4}$ " screws and a L-Angle Connector.

The Structural Tees are used to complete the ceiling grid to meet pre-determined grid spacing such as a 2' x 2', 2' x 4', or 4' x 4'.

Light Structural Infill Components

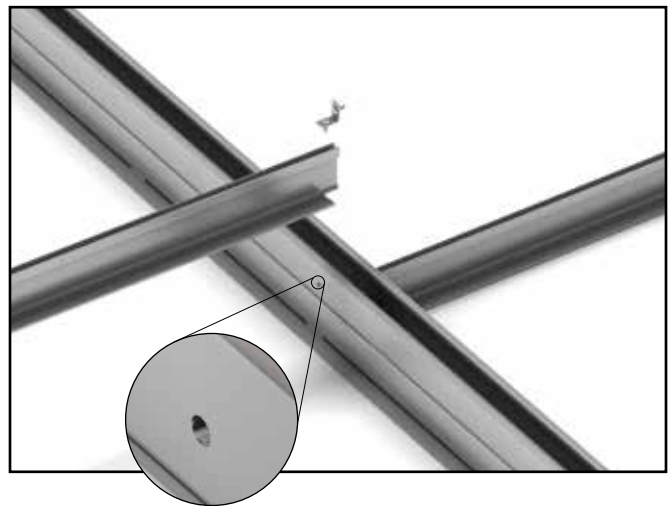


Light Structural Infill Intersections

- Light Structural Main Runners notched to positively position connectors on center every time
- Ribs on the bottom of the Field Connector align with the continuous slot on the top of the grid to prevent racking
- Light Structural Infill coped for simplified installation and stronger connections
- Attaches with 4, 1/4"-20 steel screws

Light Structural Infill Connections to Strut

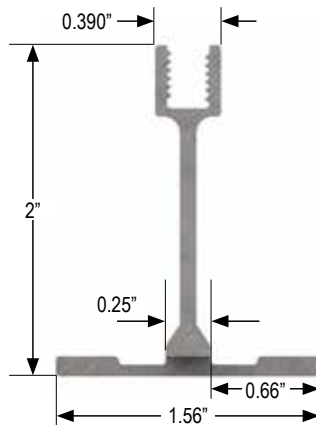
- Steel Strut Profile is factory pre-drilled at predetermined locations for Light Structural Infill connections
- Light Structural Infill coped for simplified installation and stronger connections
- L-Angle Connector attaches grid by securing Light Structural Infill to the Steel Strut Profile
- Attaches with 2, 1/4"-20 steel screws



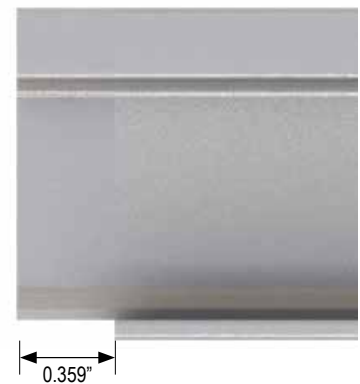
Features

- High strength aluminum construction
- Continuously threaded top slot for Strut and Infill connections
- Customizable grid member center-to-center spacing
- Built-in flange to accommodate ceiling tiles, lights and return grills

Light Structural Infill Profile

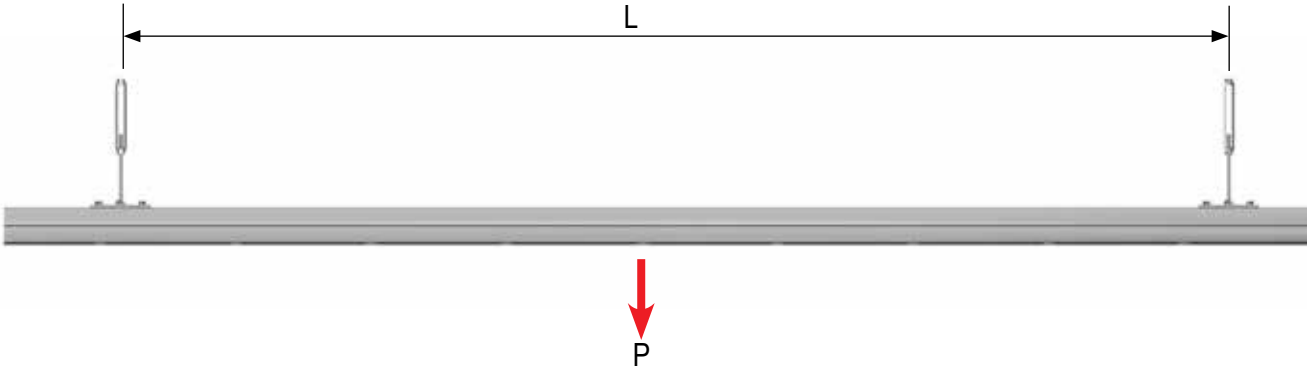


Structural Tee Coping Detail



Performance Criteria

The bottom side of Tate Strut is equipped with a continuous $\frac{3}{8}$ " open slot for mounting items directly to the ceiling grid. Refer to the table below for load capacities and corresponding deflections based on various span lengths.

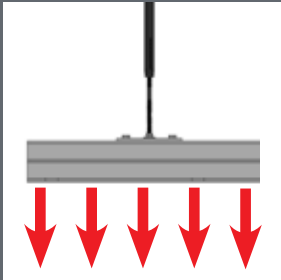
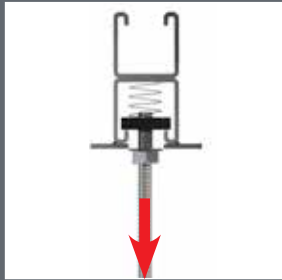


| SPAN (in) | P | D | P | | | ULF | USF |
|--------------|----------------------------------------------------|--------------------------------------|--------------------------------------------|----------|----------|------------------------------|------------------------------|
| | Max Point Load @ Yield Point ¹ (lbs) | Max Deflection @ Yield Point (in) | Max Point Load @ Various Deflections (lbs) | | | Max Uniform Load (lbs/LF) | Max Uniform Load (lbs/SF) |
| | | | SPAN /180 | SPAN/240 | SPAN/360 | | |
| 48 | 1750 ² | 0.17 | 1750 | 1750 | 1369 | 219 | 109 |
| 60 | 1750 ² | 0.33 | 1750 | 1315 | 876 | 175 | 70 |
| 72 | 1667 | 0.55 | 1217 | 913 | 609 | 139 | 46 |
| 84 | 1429 | 0.75 | 894 | 671 | 447 | 102 | 29 |
| 96 | 1250 | 0.97 | 685 | 514 | 342 | 78 | 20 |
| 108 | 1111 | 1.23 | 541 | 406 | 271 | 62 | 14 |
| 120 | 1000 | 1.52 | 438 | 329 | 219 | 50 | 10 |

1. Maximum point load 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

L (Span between Supports) = in
 E (Modulus of Elasticity) = 30×10^6 lbs/in²
 I (Moment of Inertia) = 0.789 in⁴

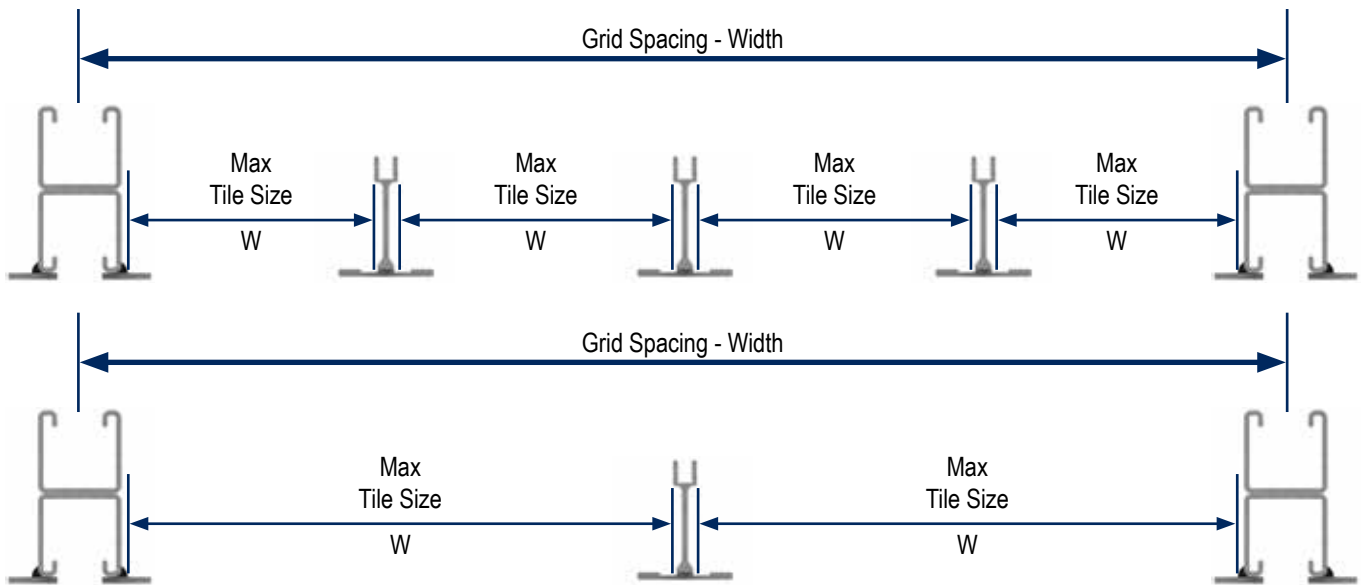
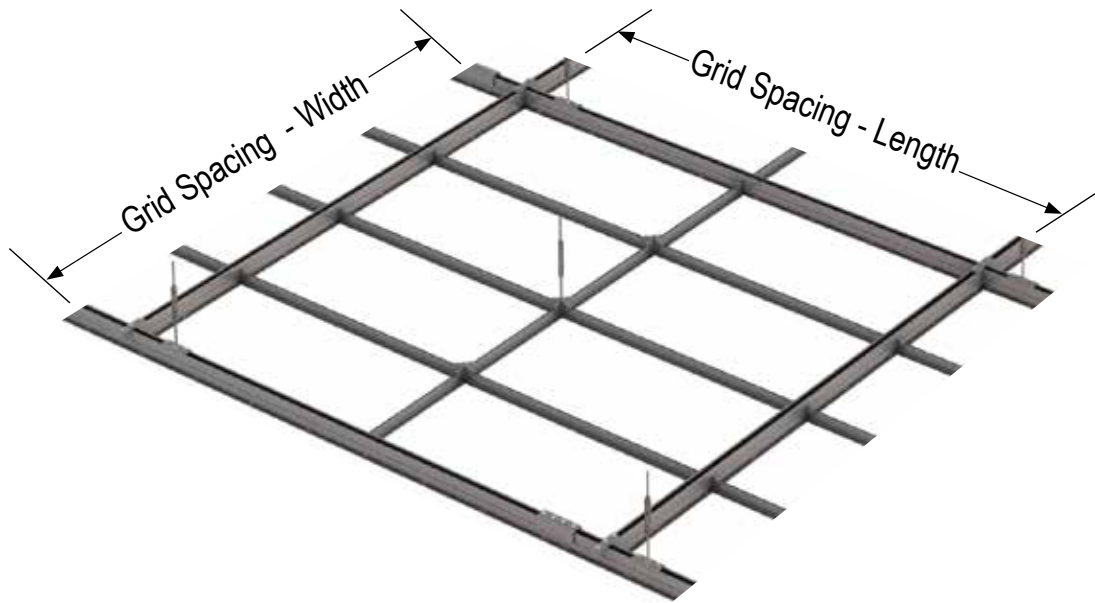
D (Deflection) = $PL^3/48EI$
 ULF (Uniform Load/LF) = $P/(L/12 \times 2)$
 USF (Uniform Load/SF) = $P/(L/12)^2$

| System Performance Criteria |  Turnbuckle Connection to Top Slot |  Connection to Bottom Slot |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Hanging Method | | |
| Point Load (lbs) | 3500 lbs | 1750 lbs |
| Minimum Ultimate Load (lbs) | 7000 lbs | 3500 lbs |

Structural Ceiling Grid Spacing & Tile Sizing

Example

Tate Strut is fully customizable to fit either a nominal acoustical tile or to any custom module sizing. The example shown is with a 8' x 8' Strut grid with Light Structural Infill being used to complete a standard 2' x 4' spacing.



In this example, if you wanted the Strut Spacing to be on a 96" x 96" module size, use this table to determine tile size requirement:

| Grid Profile | Grid Spacing (W x L) | Tile Size (W x L) |
|--------------|----------------------|----------------------------|
| Tate Strut | 96" x 96" | 23 3/8" x 46 3/4" +/- 1/8" |

If you want the Strut Spacing to be on a larger module size to fit standard 24" x 48" nominal tile sizes, use this table:

| Grid Profile | Grid Spacing (W x L) | Tile Size (W x L) |
|--------------|----------------------|----------------------------|
| Tate Strut | 98.77" x 98.27" | 23 1/8" x 47 1/8" +/- 1/8" |



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