

# Tate Grid

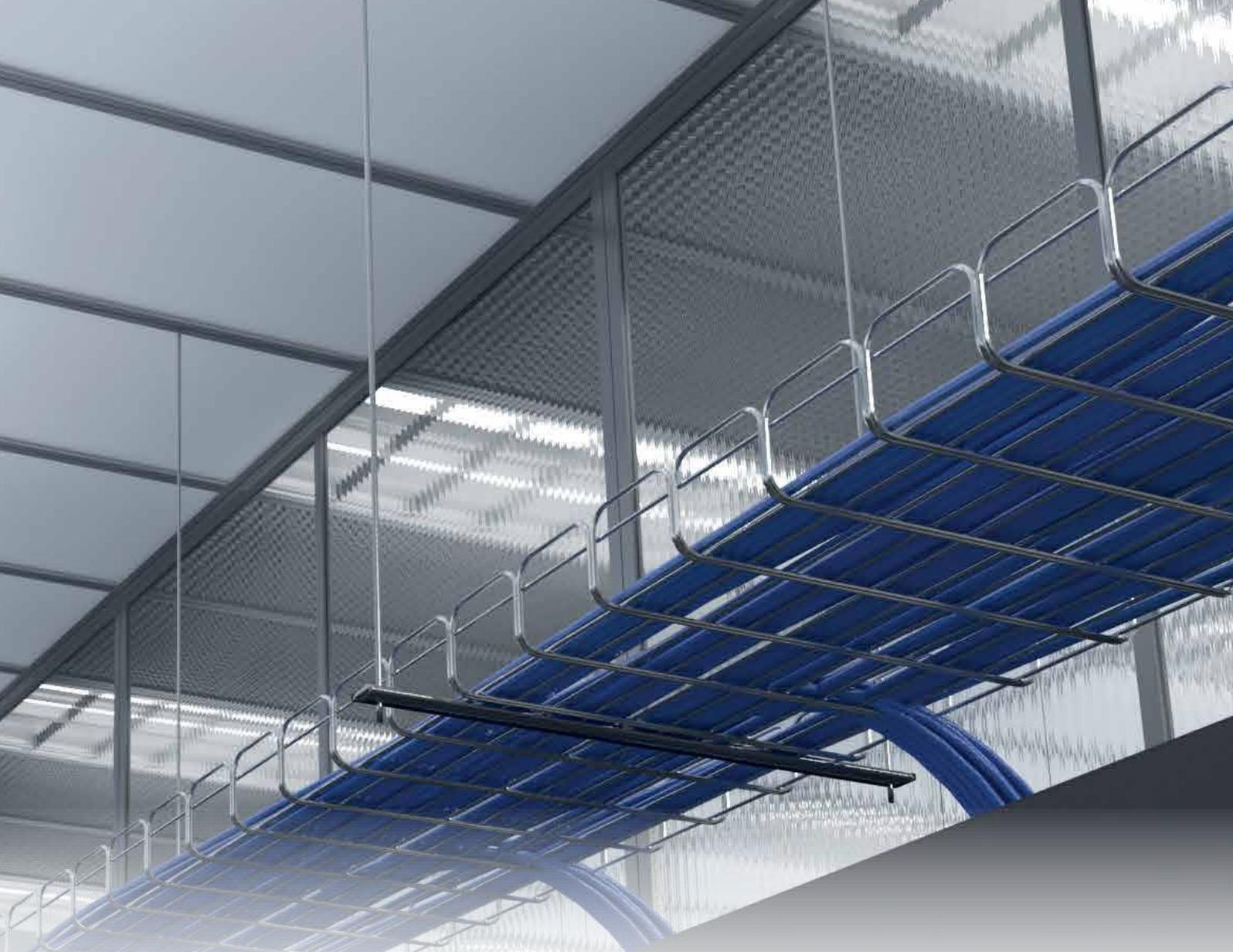
Aluminium Structural Grid System for Data Centres

Metric Edition



**Tate**<sup>®</sup>





## Tate Grid

### Aluminium Structural Grid System for Data Centres

Tate Grid is the ideal solution for any application where large heavy items need to be suspended within a building. Replacing custom-built on-site structural support systems, such as Unistrut, with Tate Grid can offer many advantages. A structural ceiling allows you to design and specify the support solution in advance and, best of all, it's less expensive and faster to install.

#### Benefits of Tate Grid:

- 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 centre product manufacturer and contracting teams

#### Leverage our Experience

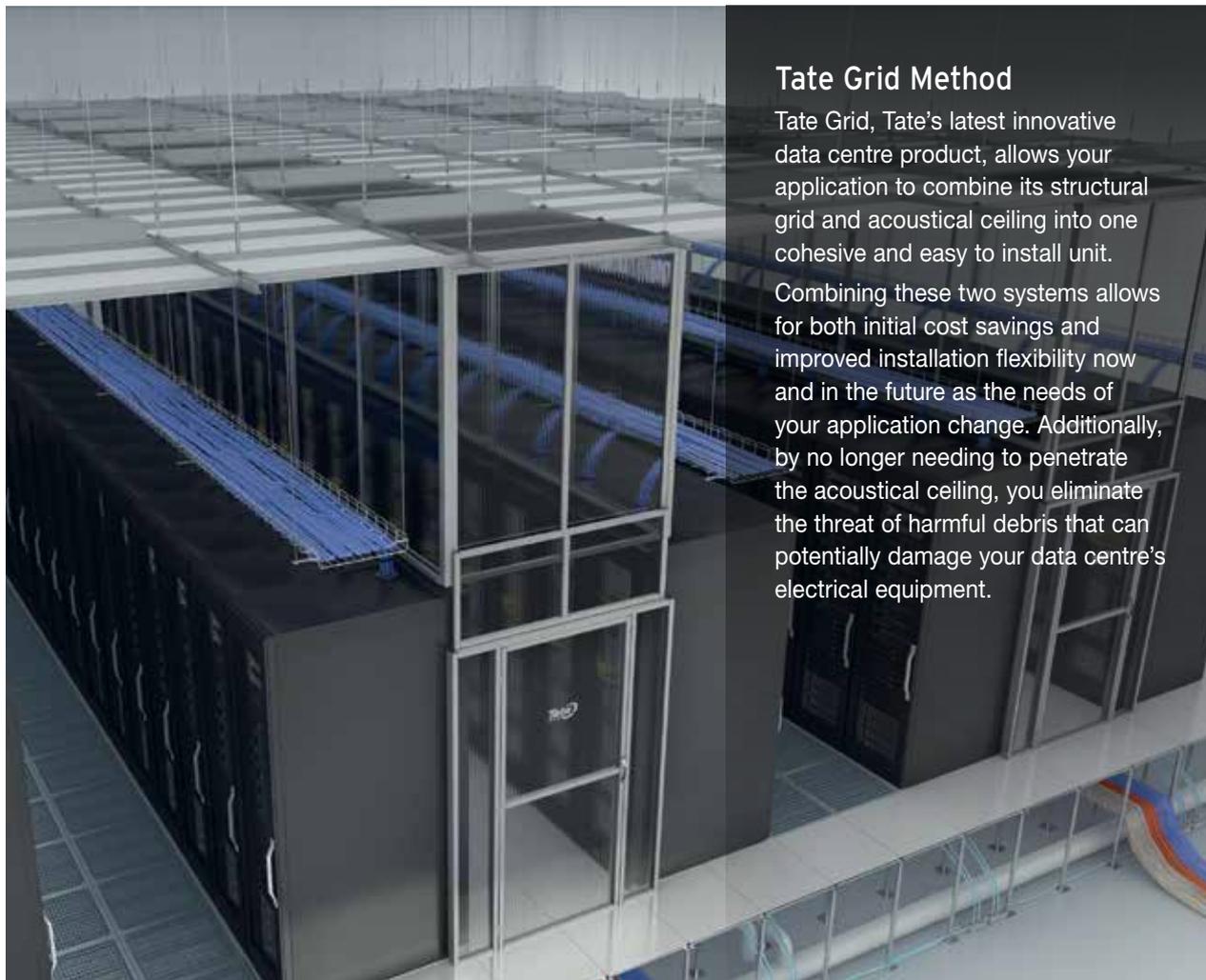
Tate offers over 50 years in data centre support to your project. Our extensive dealer network of experienced contractors can rapidly support all the needs of your project including the structural ceiling, raised floor, and containment solutions.

#### Tate Offers:

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

# Tate Grid

## An Innovative Approach to Structural Support Systems



### Tate Grid Method

Tate Grid, Tate's latest innovative data centre product, allows your application to combine its structural grid and acoustical ceiling into one cohesive and easy to install unit.

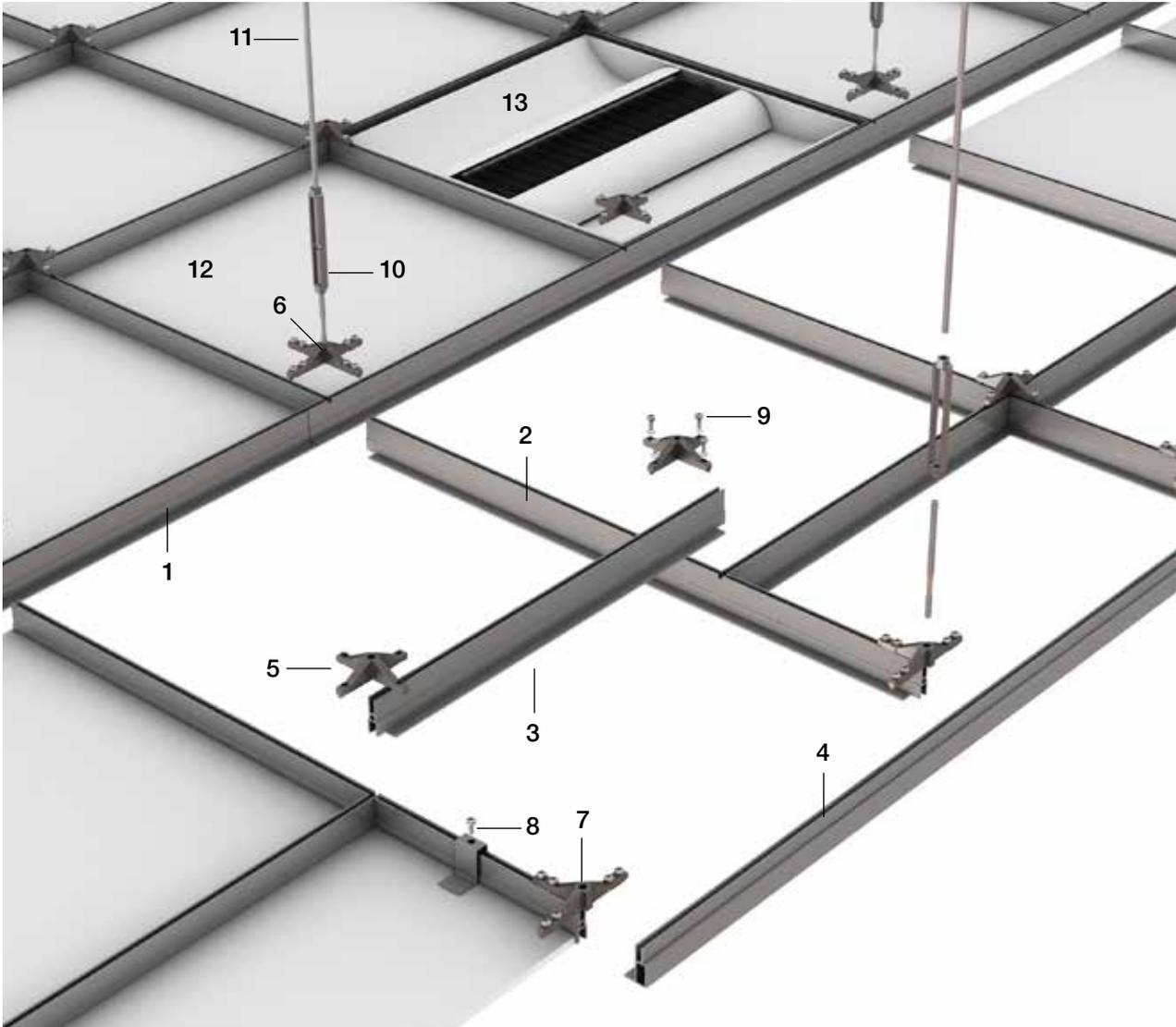
Combining these two systems allows for both initial cost savings and improved installation flexibility now and in the future as the needs of your application change. Additionally, by no longer needing to penetrate the acoustical ceiling, you eliminate the threat of harmful debris that can potentially damage your data centre's electrical equipment.

### Standard Method

For decades, the accepted method for installing acoustical and structural components in data centres was to utilize a dual ceiling structure; both a structural grid and an acoustical ceiling would be attached to the main building structure. With this approach, any heavy items that need to be supported by the structural grid must be attached by penetrating the acoustical ceiling and feeding all thread through the hole to connect to the grid above.



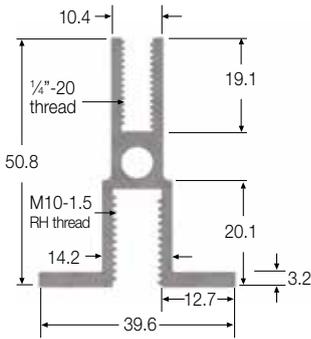
# System Design



## Tate Grid Component List

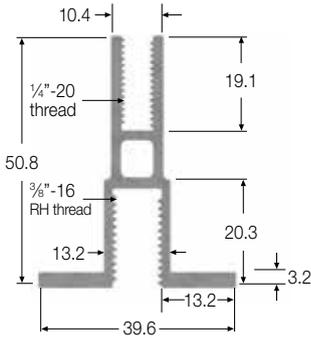
1. Main Runner
2. Primary Structural Tee
3. Secondary Structural Tee (optional)
4. Perimeter Extrusion (optional)
5. Field Connector
6. XL Connector
7. Perimeter Connector
8. Ceiling Tile Hold Down Clip (optional)
9. 1/4"-20 x 1-1/4" Screws with 1/4" Lock Washer
10. M10-1.5 Starter Rod and Turnbuckle Assembly
11. Threaded Rod Connection to Building (supplied by others)
12. Ceiling Tile (supplied by others)
13. Lighting Fixture (supplied by others)

# Structural Extrusion Range



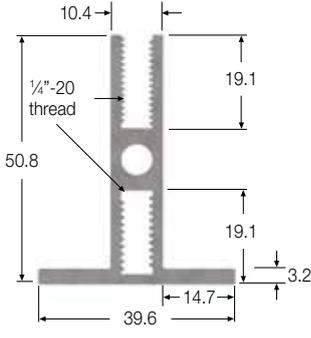
## M10 Bottom Slot\*

- Continuous threaded 1/4"-20 top slot
- Continuous threaded M10-1.5 bottom slot
- Utilizes standard hardware connectors and features of Tate Grid



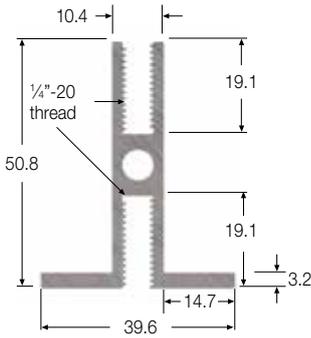
## 3/8"-16 Bottom Slot\*

- Continuous threaded 1/4"-20 top slot
- Continuous threaded 3/8"-16 bottom slot
- Utilizes standard hardware connectors and features of Tate Grid



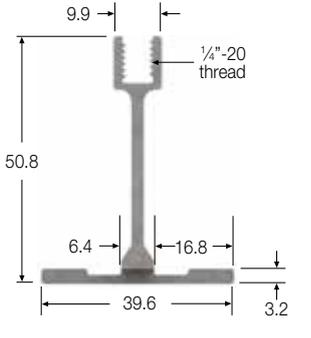
## 1/4"-20 Hidden Slot\*

- Continuous threaded 1/4"-20 slots on top and bottom
- Bottom 1/4"-20 slot is hidden and can be exposed by drilling through bottom wall cover
- Utilizes standard hardware connectors and features of Tate Grid



## 1/4"-20 Slot\*

- Continuous threaded 1/4"-20 slots on top and bottom
- Utilizes standard hardware connectors and features of Tate Grid



## Light Structural Extrusion\*

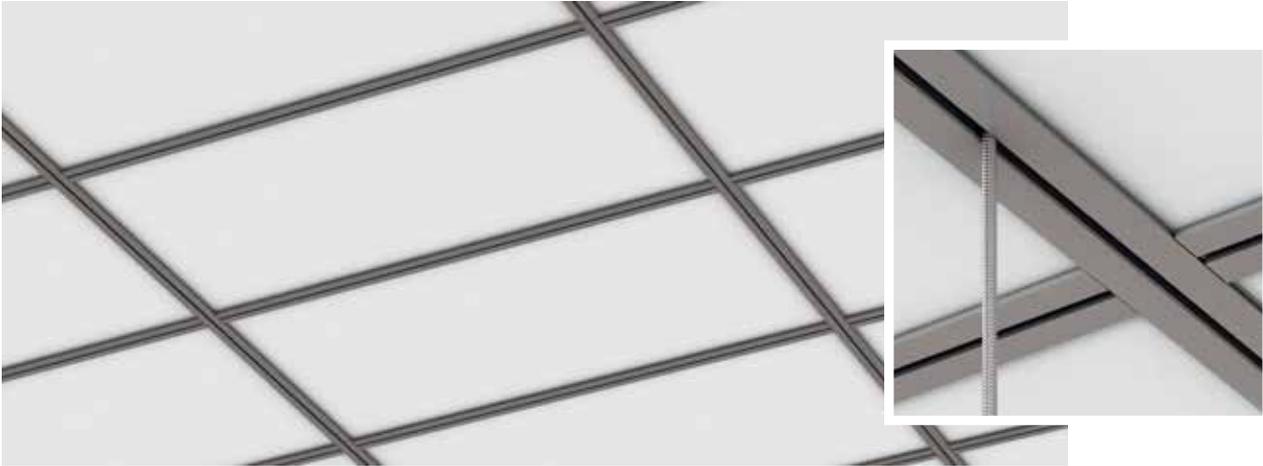
- Continuous threaded 1/4"-20 top slot
- Utilizes standard hardware connectors and features of Tate Grid
- For infill applications where complete mounting flexibility across the ceiling is not required

\*Note: All Dimensions are in Millimeters

# Customized Configuration

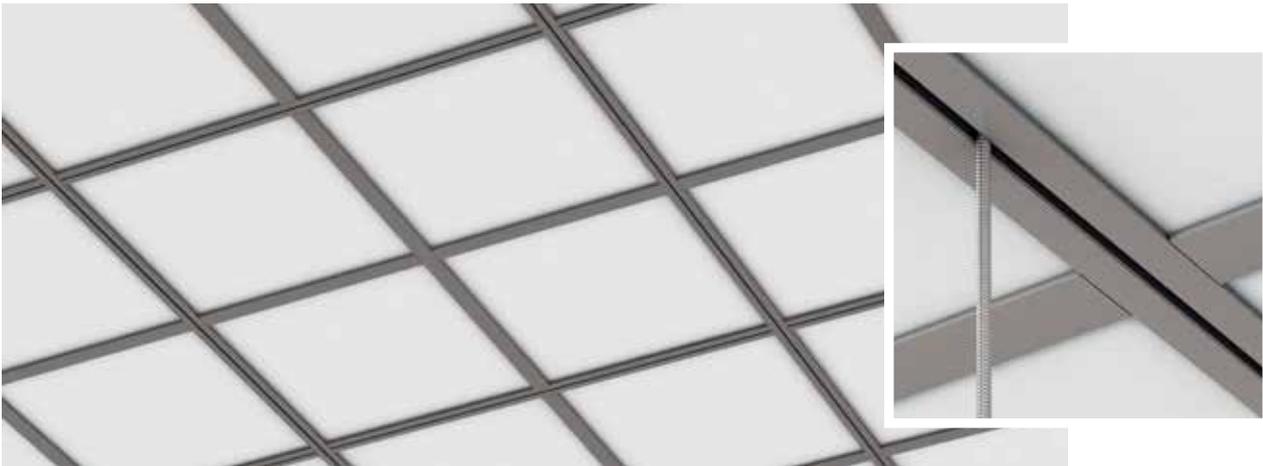
The multiple structural extrusion options available with Tate's field grid system provides maximum flexibility to meet the specific needs of any application.

## Continuous Slot



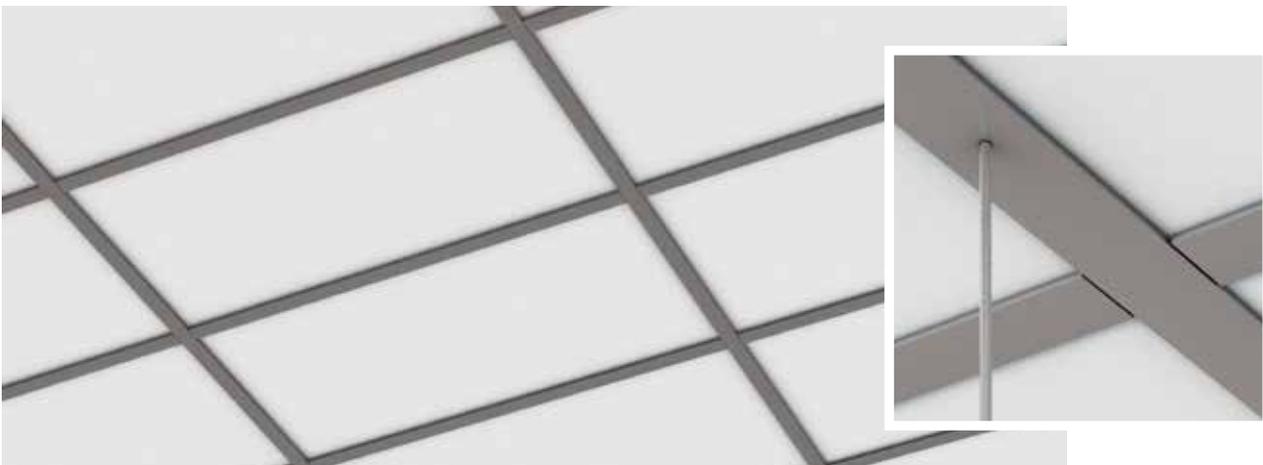
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## Slot and Light Duty Infill



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## Hidden Slot

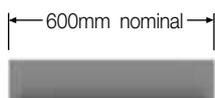


# Field Details

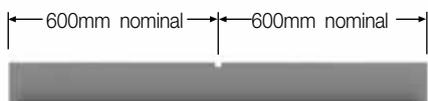
Tate's field grid system has been engineered with alignment features that make it quick and easy to install. The Field Connectors each feature a ribbed underside that fits into the top side track of the grid. Spacing and alignment are simplified by using locating notches in the Mains and Tees which allow the rib in the connector to perfectly align the four segments of the grid. The grid is capable of supporting HVAC, light fixtures, registers, cable trays, utility racks, and other accessories.

## Main Runner & Structural Tee Specifications

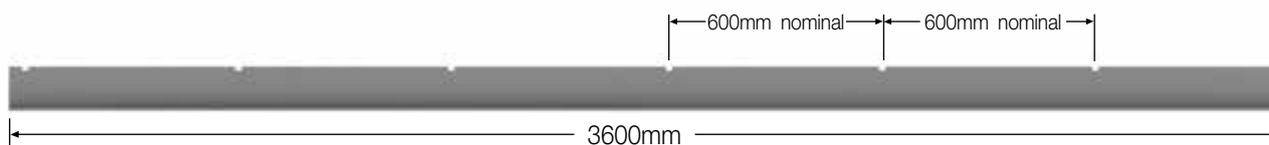
- Pre-engineered and factory produced aluminium structural ceiling grid with continuously threaded slot
- Grid consists of Main Runners with notches for precise location and connection of coped Structural Tees using simple four screw connectors
- Capable of supporting power modules, light fixtures, cable trays, partitions, and other accessories
- Load performance based on building connection spacing of 1200mm on center
  - Max grid point load at midspan of 1.7 kN
  - Max grid uniform load of 2.4 kN/m<sup>2</sup>
  - Safety factor of 2 for all connections
- Grid member center-to-center spacing can be selected to accommodate project-specific specifications (see page 15 for more information)
- Available in clear anodized, white, or black painted finish



All 600mm and 1200mm Structural Tees have coped ends which allows the grid to rest on the longer sections for stronger connections and simplified installation.



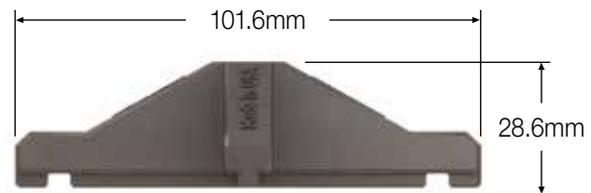
All 1200mm Structural Tees and Main Runners are notched every 600mm on center for proper alignment and spacing of the connectors.



## Field Connector Specifications



- Accommodates M10-1.5 threaded turnbuckle connection
- 3.6 kN point load connection to building structure
- Ribs on the bottom of the connector align with the continuous slot on the top of the grid to prevent racking
- High strength cast aluminium construction
- Corrosion resistant aluminium casting
- Attaches to grid with 4, 1/4"-20 steel screws



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## XL Connector Specifications

The XL Connector is used to splice main runners together. Like the Field Connector, it features a ribbed underside that fits into the top side track of the grid.



- Requires M10-1.5 threaded turnbuckle connection
- 3.6 kN point load connection to building structure
- Ribs on the bottom of the connector align with notches on the grid to prevent racking
- High strength cast aluminium parts
- Corrosion resistant aluminium casting
- Attaches to grid with 8, 1/4"-20 steel screws



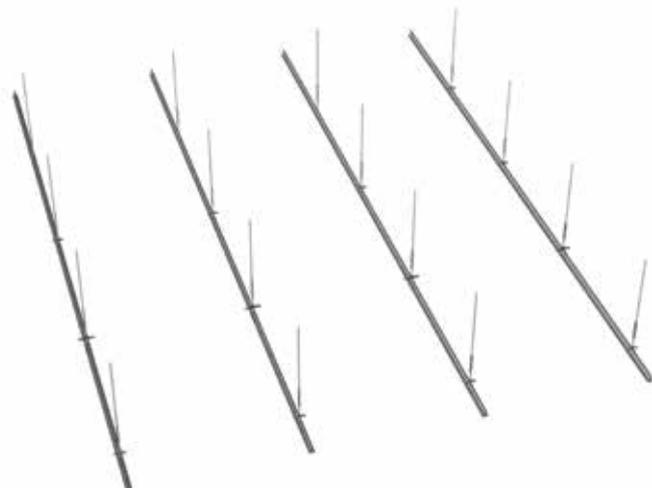
# Field Grid Assembly

While Tate Grid can be customized to meet the needs of your specific application, the following example is based on 600mm x 600mm grid spacing with turnbuckle connections on 1200mm x 1200mm centers.

## Step 1

### Install Main Runners

The Mains are equally spaced every 1200mm. All thread and turnbuckles are placed every 1200mm along the mains to connect them to the building structure. Field Connectors are used along the Mains and the connection point between two adjoining Mains require XL Connectors.



## Step 2

### Install 1200mm Structural Tees

The Structural Tees are placed every 600mm along the Mains. The 1200mm Tee's are factory coped on each end so that they rest on top of the Mains. All connections are aligned using factory cut notches every 600mm in the top edge of the Mains. The notches along the Mains provide proper location and alignment of the grid and speed up installation.



## Step 3

### Install 600mm Structural Tees

For ceilings planning to use a 600mm grid, additional 600mm Structural Tees can be installed between the 1200mm Structural Tees. These 600mm Structural Tees connect to the 1200mm Tees using Field Connectors. The connectors are aligned using factory cut notches in the top edge of the 1200mm Structural Tee.



# Assembly Details



## **Main Runner Connections**

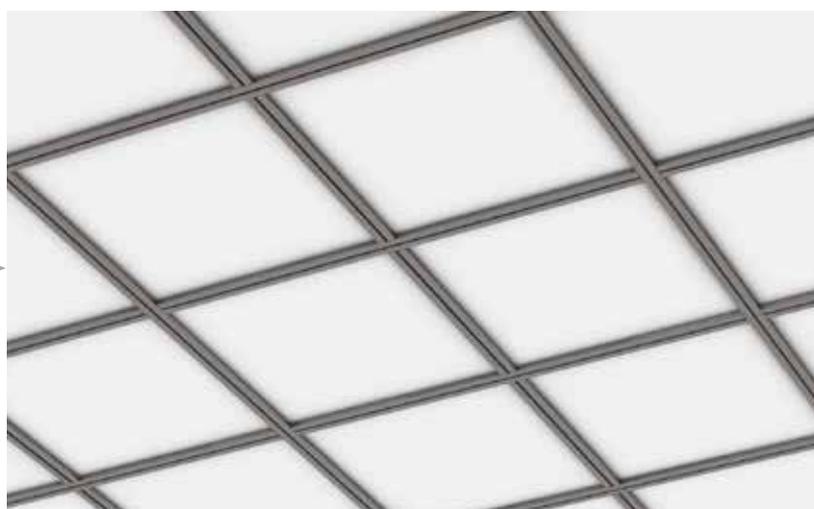
Mains are factory notched for precise location of connectors. XL Connectors are used to splice Main Runners together and Field Connectors are used on all other connections.



## **1200mm Structural Tee Connections**

All 1200mm Structural Tees are load bearing, providing flexibility in the location of equipment.

The close-up on the left shows factory coped Tees supported on the edge of the Main and the alignment using the factory notch in the Main Runner.



## **600mm Structural Tee Connections**

The 600mm Structural Tees are installed using the same method as the longer Structural Tees. From the floor you can see that all Tees and Mains have a threaded slot for mounting equipment providing maximum flexibility.

# Perimeter Details

## Perimeter Connections

There are several differences between a Field Connector and a Perimeter Connector. Perimeter Connectors are primarily for installation along the walls of the space and are therefore designed to be easily cut in the field during installation. They also feature two mounted screws on each leg for additional support when 4-way connections are not an option. The bottom of the Perimeter Connector is designed with ribs to assist in the alignment of the connector on the extrusion.



## Connector Specifications

- Accommodates M10-1.5 threaded turnbuckle connection
- On site modifiable connectors for perimeter installation
- 3.6kN point load connection to building structure
- Ribs on the bottom of the connector align with the continuous slot on the top of the grid to prevent racking
- High strength cast aluminium construction
- Corrosion resistant aluminium casting
- Attaches to grid with 8, 1/4"-20 steel screws

## Perimeter Angles

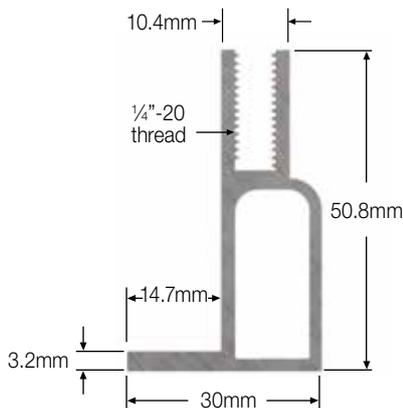
The Perimeter Angle provides a professional finished look along walls and columns. The angles do not have an underside track for mounting equipment, however, it will maintain the grid spacing to begin the installation.

## Fixed Mounting Detail

Perimeter Angles can be bolted directly to the wall with appropriate fasteners for the wall type. Note that pre-drilling is recommended and through holes are suggested for simpler light fixture or drop ceiling tile installation.

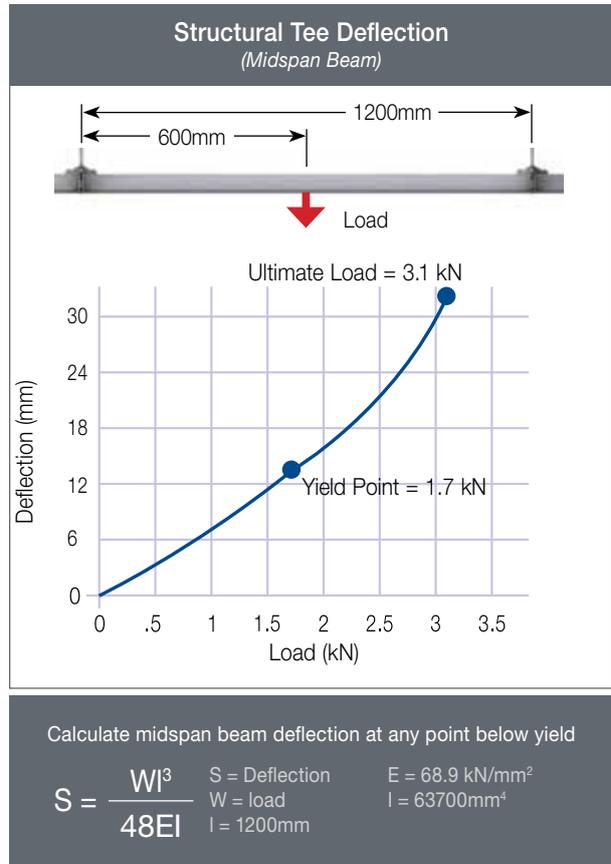
## Floating Mounting Detail

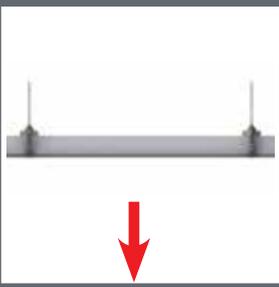
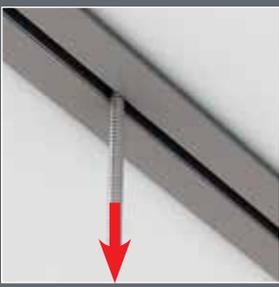
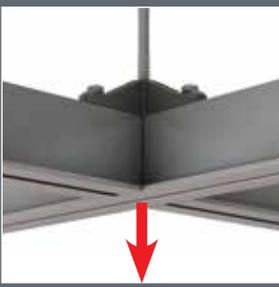
The perimeter can be allowed to float with the rest of the ceiling by bolting a Wall Angle to the wall. Main Runners and Perimeter Connectors are then used so the ceiling grid can be floated up to touch the Wall Angle.



# Performance Criteria

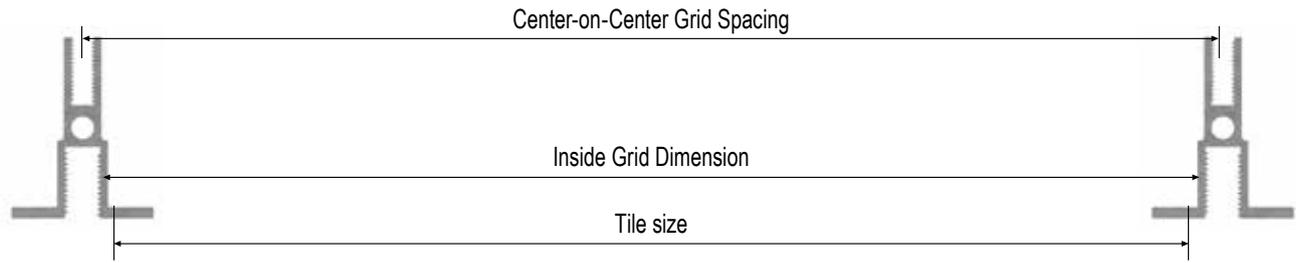
The bottom side of the structural grid is available with an M10-1.5, 3/8"-16, or 1/4"-20 continuous threaded slot for mounting items directly to the grid. Refer to the table below for load performance details on the grid and connections.



System Performance Criteria			
Hanging Method	Grid Load Performance <i>(with building connections 1200mm x 1200mm on centers)</i>	Connection to Bottom Slot	Connector to Grid
Point Load (kN)	1.7 kN*	1.7 kN*	3.6 kN*
Uniform Load (kN/m <sup>2</sup> )	2.4 kN/m <sup>2</sup>	-	-
Ultimate Point Load (kN)	3.1 kN	3.4 kN	7.2 kN

\*Max point load no less than 1200mm apart in any direction.

# Grid Spacing & Tile Sizing



If you want the Grid Spacing to be on a 600 x 600mm or 600 x 1200mm module size, use this table to determine tile size requirement:

Grid Profile	Grid Spacing (L x W)	Tile Size (L x W)
1/4"-20 Bottom Slot & 1/4"-20 Hidden Slot	600 x 600mm	582 x 582mm +/- 4mm
	600 x 1200mm	582 x 1182mm +/- 4mm
M10-1.5 & 3/8"-16 Bottom Slot	600 x 600mm	580 x 580mm +/- 3mm
	600 x 1200mm	580 x 1180mm +/- 3mm (see example below)

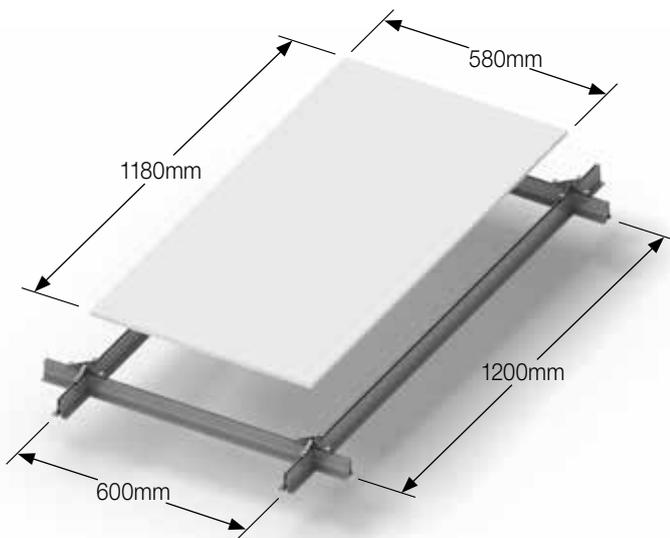
Note: Maximum Tile Size = Inside Grid Dimension minus 3.2mm. Minimum Tile Size is based on a minimum overlap on the extrusion flange of 3.2mm when the tile is shifted all the way to one side.

If you want the Grid Spacing to be on a larger module size to fit standard 600 x 600mm or 600 x 1200mm nominal tile sizes, use this table:

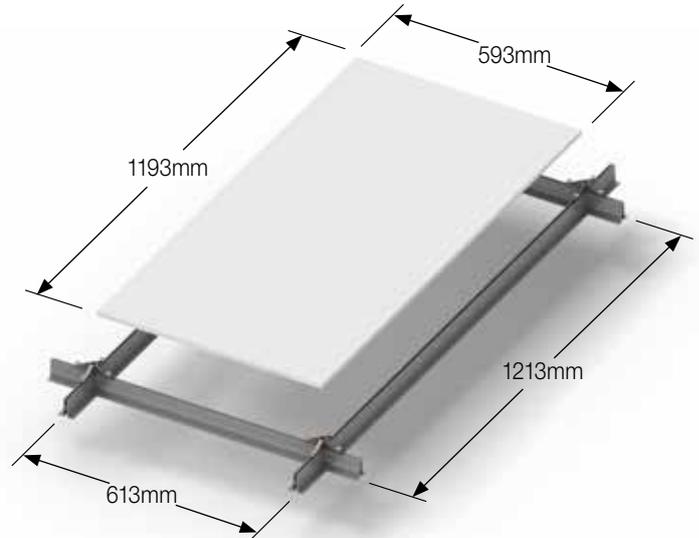
Grid Profile	Grid Spacing (L x W)	Tile Size (L x W)
1/4"-20 Bottom Slot & 1/4"-20 Hidden Slot	610 x 610mm	593 x 593mm +/- 4mm
	610 x 1210mm	593 x 1193mm +/- 4mm
M10-1.5 & 3/8"-16 Bottom Slot	613 x 613mm	593 x 593mm +/- 4mm
	613 x 1213mm	593 x 1193mm +/- 4mm (see example below)

Note: Maximum Tile Size = Inside Grid Dimension minus 3.2mm. Minimum Tile Size is based on a minimum overlap on the extrusion flange of 3.2mm when the tile is shifted all the way to one side.

**Sizing Based on  
600 x 1200mm Grid Spacing**

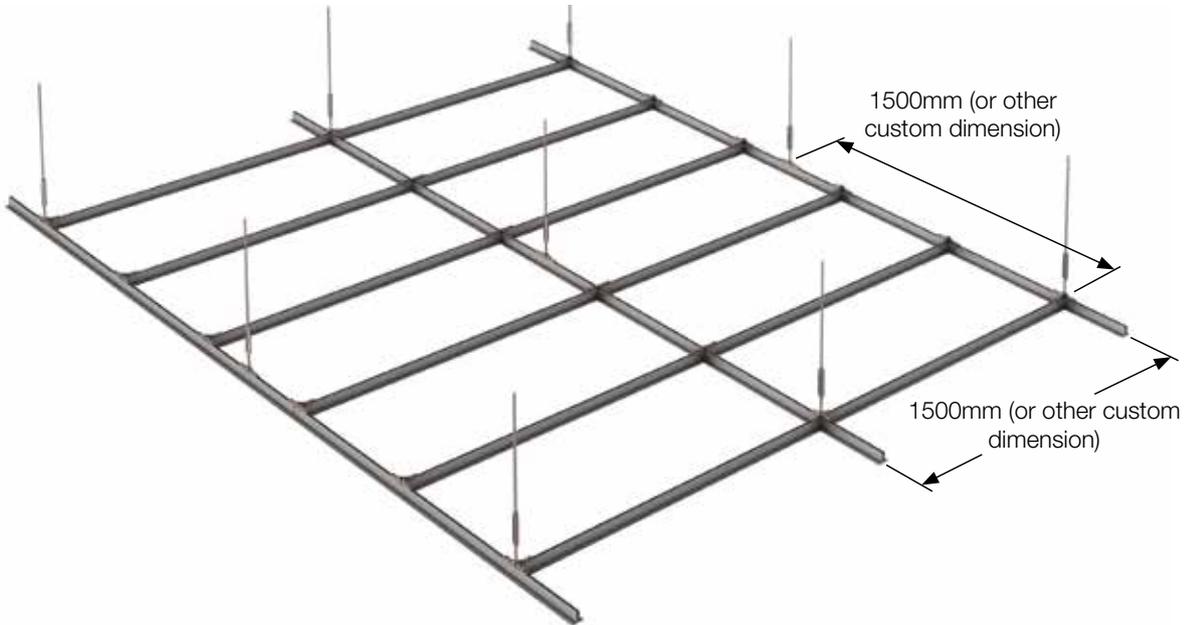


**Sizing Based on 600 x 1200mm  
Nominal Tile Size**



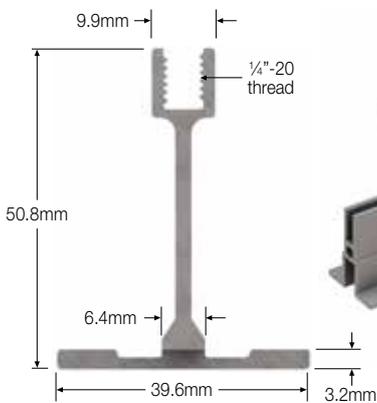
# Customizable Solutions

Tate offers a level of flexibility not commonly available from other ceiling manufacturers. Our standard grid sizes are 600 x 600mm or 600 x 1200mm, however, we know that some installations require other sizes. We are happy to work with you to create a 600 x 1500mm, 1500 x 1500mm, or any other variation of grid to fit your needs. In addition, we have the capability to create custom solutions that combine structural and non-structural components within the same grid system.



## Light Structural Extrusion

Tate has developed a Light Structural Extrusion that is designed to integrate with the Main Runners and Structural Tees. This offers a customizable solution for applications that do not require complete mounting flexibility across the ceiling. The Light Structural Extrusion features a smooth underside and a threaded slot on the top for easy connection to Main Runners and Structural Tees with a Field Connector.



## Ceiling Tile Gaskets

Gaskets can be added to the Main Runners and Structural Tees to create an air-tight dust free ceiling installation. The factory applied adhesive backed gasket is placed on the top side of the extrusion. A mounting clip can be used to keep the ceiling tiles tightly secured against the gasket.



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