

Tate Forte LEC

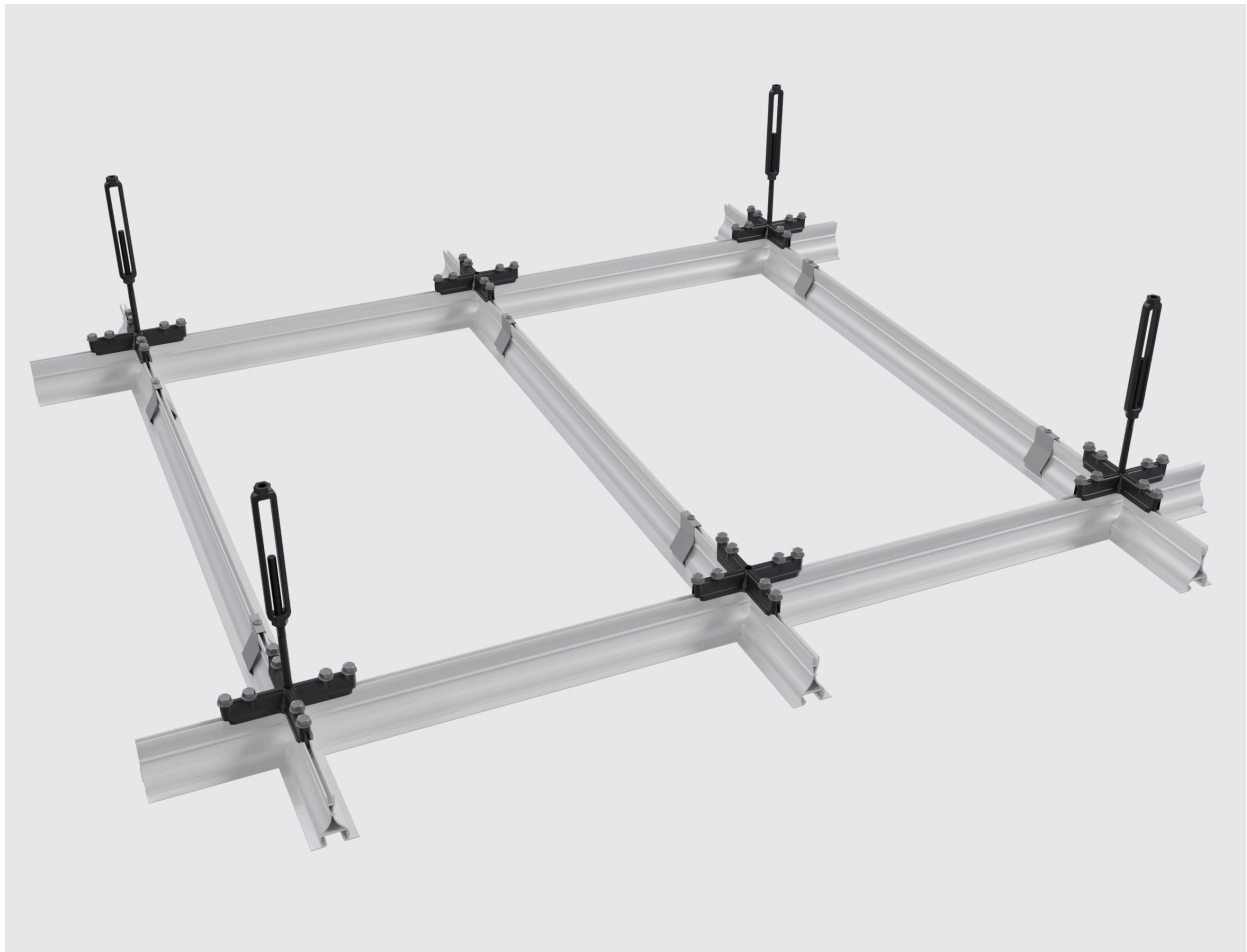


EN 12114



AS/NZS5637.1

Installation Manual

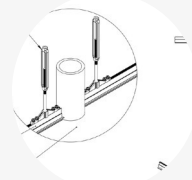


Please ensure you use the most up-to-date version of the Installation Manual available on our website. This manual pertains specifically to the installation of Tate Forte LEC in the APAC region. Installation procedures may vary in other regions.

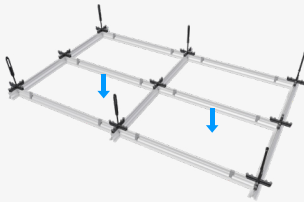
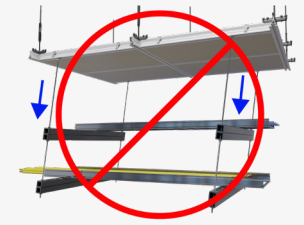
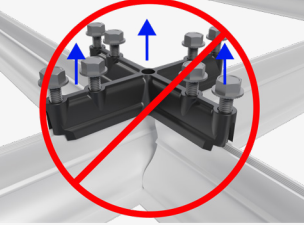
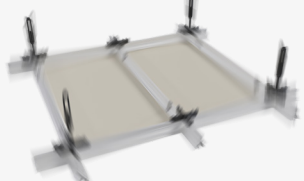
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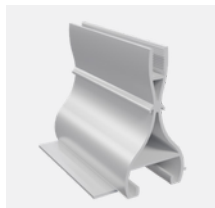
Safety Guidelines

1	Tate Forte LEC is NOT a walk-on ceiling.	To safely perform any work above the ceiling, a floor-supported platform must be used - This platform must be entirely independent of the Tate ceiling system - It should not rest on, connect to, or apply any load to the ceiling or its components. Failure to follow this guideline may cause damage, risking ceiling integrity and site safety.	
2	Only use screws supplied by Tate on the top slot of the profile.	The screws provided by Tate are specifically selected and tested for use in the top slot of the Tate Forte LEC connector. They ensure proper fit, and long-term structural reliability. Using alternative screws may compromise performance and void system warranty.	
3	To ensure safe and accurate installation, one of the following tool types must be used:	a. Power tools with torque limiter: - all power tools must be fitted with a 7Nm torque limiter - Using the 'Impact' function on any power tool is strictly prohibited b. Torque wrench Use a calibrated torque wrench to apply 7Nm of torque on the top channel connections. (Supplied by others.) Incorrect tools, or improper calibration may lead to thread damage, posing a risk to ceiling integrity and site safety.	
4	Use 7Nm Torque on Top Channel Screws.	During installation of a Tate Forte system, screws into the top channel must be tightened to the required torque of 7Nm. Incorrect torque may cause thread or system damage, risking ceiling integrity and site safety.	
5	When encountering an obstacle that would obstruct a Tate profile during the installation of a Tate Forte LEC system, the following guidelines should be adhered to:	a. Refer to Tate Forte LEC standard detail drawings for columns, bulkheads, or openings in the grid layout. b. Do not cut any part of a Tate Forte LEC profile for a penetration unless additional hangers are installed on either side of the obstructing element. c. Any profile section that extends in cantilever must be treated as non-structural and must not carry any load. For correct details, always refer to the Standard Details. Improper handling of obstructions may lead to system damage, risking ceiling integrity and site safety.	Extra hangers supported from substructure located as close to the end of the profile as situation will allow. Profile can be cut clean and supported with extra hanger. Tiles cut on site to match requirements of the Pipe. 

Safety Guidelines

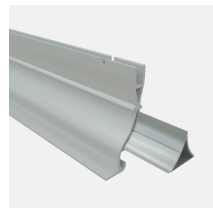
6	Adhere to load limits and installation configuration for Tate Forte LEC: The structural performance of the Tate Forte LEC system depends on all the following load and spacing conditions being met simultaneously:	a. Maximum Safe Working Point Load (SWPL): 4.4 kN b. Corresponding Safe Distributed Uniform Load: 6.1 kN/m² c. Drop Rod Requirement: Must be designed to carry 9kN, (no safety factor applied), at the connection to the building structure. The appropriate factor of safety is to be determined by the building designer. d. The hanger spacing configuration for the above values is 1,200mm x 1,200mm. <i>If any of these four conditions are not met, this may result in overloading, deformation, or failure of the ceiling components, risking ceiling integrity and site safety.</i>	
7	Do not impose dynamic loads on a Tate Forte LEC System	Tate Forte is designed for stable, controlled loading. Avoid dynamic forces that may stress connections. This applies, but is not limited to: • Containment installers – who must brace cable trays. • Cable pullers – who must use rollers to avoid ceiling strain. <i>Excessive tension, sudden impact, or dragging forces can lead to connection loosening, risking ceiling integrity and site safety.</i>	
8	Structural components must not be modified without authorization Once components are installed, they must not be removed or modified without explicit sign-off from the responsible party.	This is especially critical during overlap periods on site, where M&E trades may begin work before ceiling installation is fully complete. • During construction: Responsibility lies with the General Contractor to define when and by whom the ceiling can be accessed or altered. • Post-handover: Responsibility transfers to the building owner or facilities team. <i>Removing system components may compromise the structural integrity of the ceiling, resulting in deformation, connection failure, or damage at critical interface points, risking ceiling integrity and site safety.</i>	
9	Site-specific seismic requirements must be identified and addressed in the design stage Seismic requirements vary by region and must be accounted for in the ceiling design and installation.	Tate Forte LEC may need additional bracing to perform under seismic loads. It's the client responsibility to ensure all project-specific seismic criteria is addressed before installation begins. Tate can provide technical support or input upon request to help interpret or align with these requirements. <i>Failure to account for seismic requirements may lead to non-compliant installation, increased structural risk, or project delays due to retroactive modifications.</i>	
10	Always include Tate safety guidelines in the relevant safety documentation for installers.	Tate safety guidelines must be acknowledged by all installers interacting with the ceiling system (including containment installers or cable pullers) and incorporated into their respective installation and safety documentation. <i>For training, safety workshops or additional information please contact our team at Tate Academy.</i>	

Component Overview



Coped cross tee 1.2m

Coped standard cross tee.



Main runner 3.6m

Standard main runner. Main runner comes with telescopic splice factory installed. The splice kit is a necessary part of the structure when splicing the main runners.



XL connector

Heavy duty connector that is used to splice main runners. Connector has a pin on the bottom surface to match the notches on the main runner.



Straight connector

An auxiliary connector is used when it is necessary to splice the Main runners outside the standard grid section or as an additional support point.



Offset Perimeter connector

The connector is used for 3-ways connections as the ending element of the system.



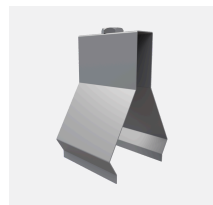
Corner connector

The connector is used in corners and does not have bottom ribs for greater flexibility during installation. Allowable joint angles 88-92°. Two threaded holes for drop rods.



M8-35 Bolt (DIN 6921)

Hex head screw with serrated flange. Used for all connectors.



Screw Down Ceiling Clip

Accessibility clip allows for the easy removal of tiles to gain access above the ceiling.



Perimeter Profile

Perimeter profile can be used at the data hall perimeter or around obstructions.



Turnbuckle M10

M10 Turnbuckle with a starter rod is used to connect the structural ceiling with M10 threaded rods.



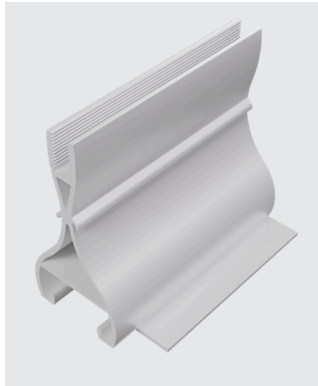
Security Hold Down Clip

Hold down clip that prevents removal of tiles below the ceiling for security. Hold down clips should be used on all edges where the tile has been cut. Clip can be cut on-site to suit perimeter installation.

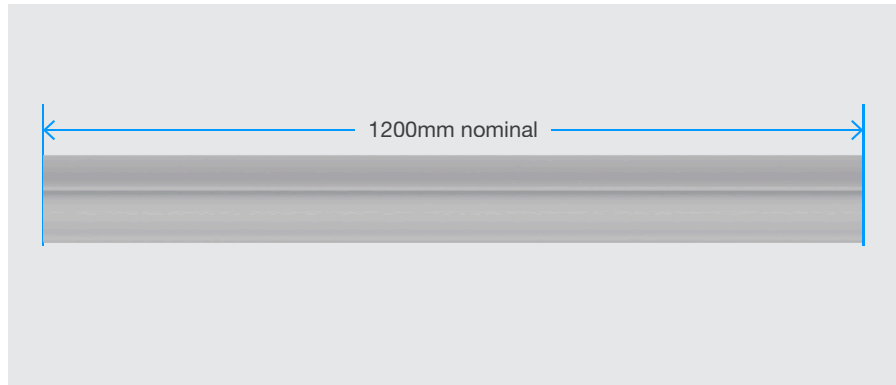
Component Overview

Coped Cross Tee 1.2m

Cross Tees are extrusions of 1200mm nominal length. Cross Tees are coped at their edges to interface with the main runners creating a 1200mm x 600mm grid.

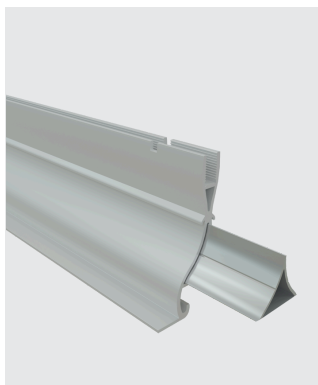


Coped Cross Tee

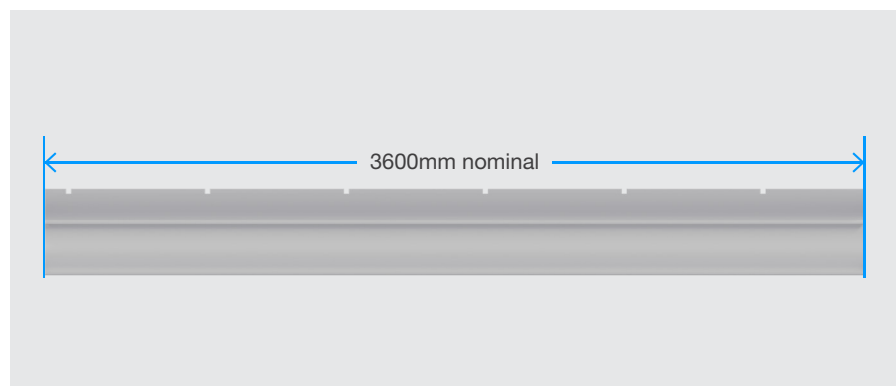


Main Runner 3.6

Main runners act as the principal structure in the structural ceiling grid system. All Main runners come in 3600mm lengths and are notched every 600mm to align the connection of the cross tees. Each main runner comes with a pre-assembled splice. Distance between main runners is 1200mm to allow a coped cross tee to sit between them creating a ceiling grid of 1200mm x 600mm.



Notched Main Runner with splice



Component Overview

XL Connector

4-way connector used at:

1. Splice point between main runners on a standard 1200mm x 600mm grid configuration.
2. Junction between cross tees and main runners. The XL connector has a pin that, when inserted into the main runner's notch, ensures alignment of the ceiling grid system.

Please refer to the Tate Forte LEC standard detail document for further information and diagrams.



Straight Connector

Special use connector for hanger configurations outside of the standard 1200mm x 1200mm. This connector does not have a pin and is useful in situations where an extra hanger is needed as it can be installed anywhere on the extrusion. Dual straight connector's on 600mm hanger spacing's allows for flexible hanging to overcome limitations in the building structure.

Please refer to the Tate Forte LEC standard detail document for further information and diagrams.



Component Overview

Perimeter Connector

1. 3-way connector used for all junctions finishing at the perimeter.
2. This connector does not have a pin allowing for flexibility in the perimeter connections.
3. M10 threaded hole has a 20mm offset to allow for easier installation of the turnbuckle.

Please refer to the Tate Forte LEC standard detail document for further information and diagrams.



Corner Connector

1. 2-way connector used at the junction point of 2 intersecting profiles. The allowable joint angle is between 88 and 92 deg.
 2. This connector has 2 possible turnbuckle positions to allow for flexibility in Hanger installation.
 3. M10 threaded hole has an 80mm offset (in each direction) for easier installation of the turnbuckle.
 4. Connector is used for connecting to perimeter profiles only.
- Please refer to the Tate Forte LEC standard detail document for further information and diagrams.



Component Overview

M8-35 Bolt (DIN 6931)

DIN 6921. Hex head screw with serrated flange. Used for all connectors.



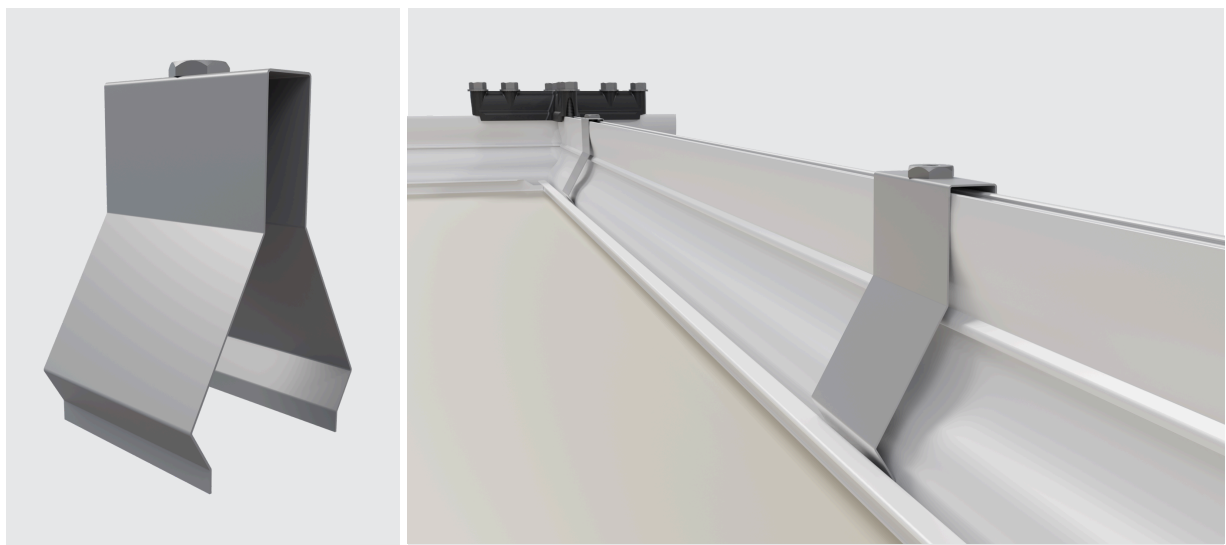
Component Overview

Screw Down Ceiling Clip

Clips for Metal Tiles. The spring on them allows the tiles to be installed and/or removed from under the ceiling.

Ceiling clips are to be used with metal tiles with a folded edge of 12mm.

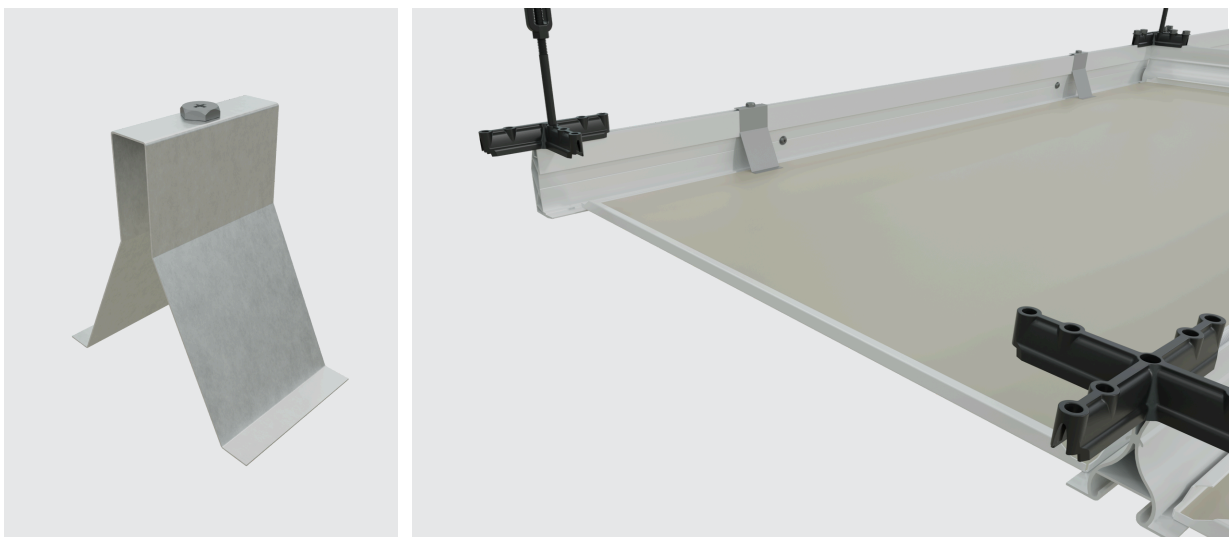
Ceiling clips are not suitable if the tiles have been cut or when using mineral tiles. Refer to security hold down detail.



Security Hold Down Ceiling Clip

Hold down clips for metal tiles. The clip is used as a security to prevent the removal of tiles.

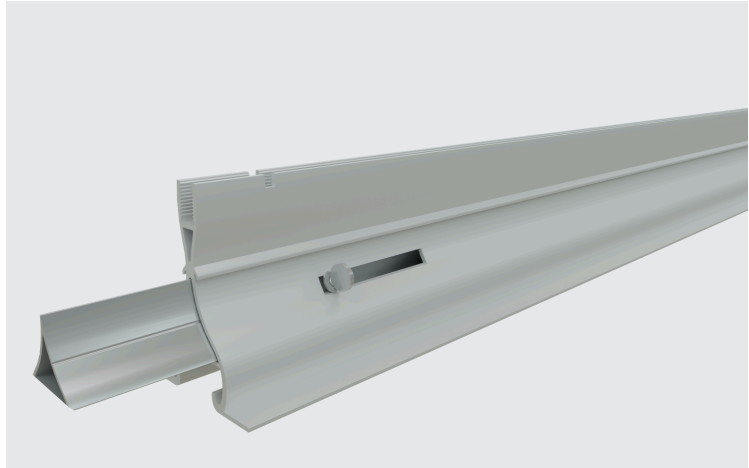
Clips will be used on all edges where the tile is cut to provide support, due to the tile modification.



Component Overview

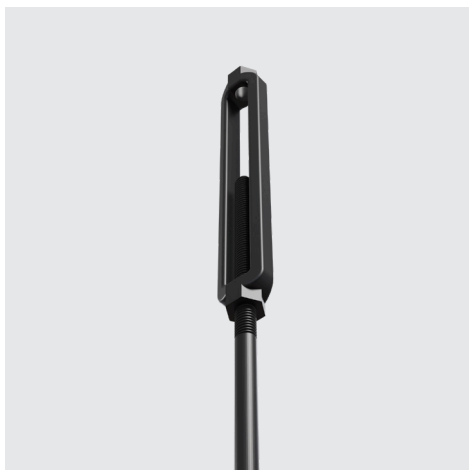
Splice Kit

The Splice Kit is used at all junctions between 2 main runners.



Turnbuckle M10

A turnbuckle with an M10 starter rod is provided. Hanger configurations of the Tate Forte LEC system are project specific. Please refer to the technical data sheet for performance details. Made from black painted steel, turnbuckles allow the hangers to be properly set and aligned. Turnbuckles connect the connectors from the Tate Forte LEC system to the top threaded rods. Turnbuckle + starter rod minimum height is 350mm.

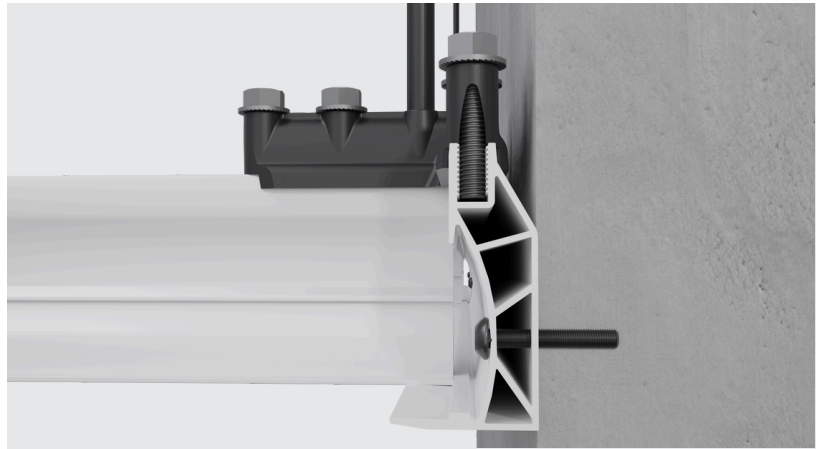
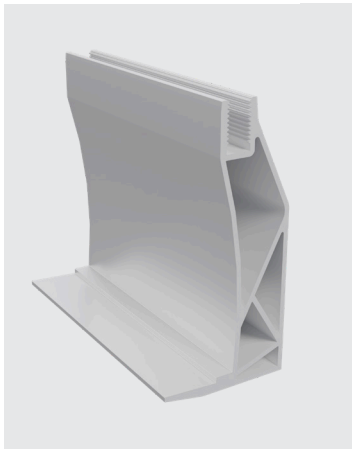


Component Overview

Perimeter Profile

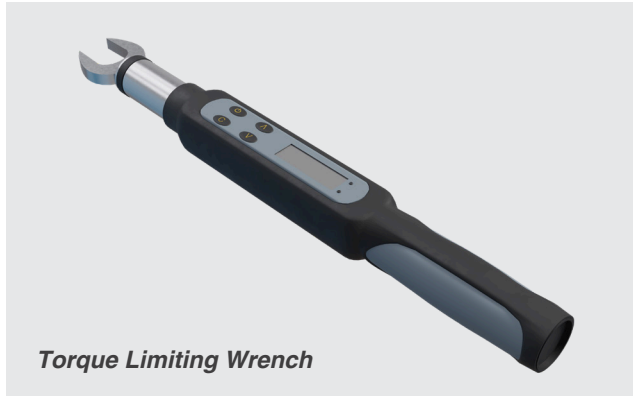
The perimeter profile is a closed face profile that is installed at the perimeter of the room and around columns. It can be directly attached to the wall. The perimeter profile flange fits under the main runner or cross tee ensuring air leakage and structural integrity of the system, with no coping required.

The distance from the wall to the center of the turnbuckle is 39mm, allowing for easier installation.

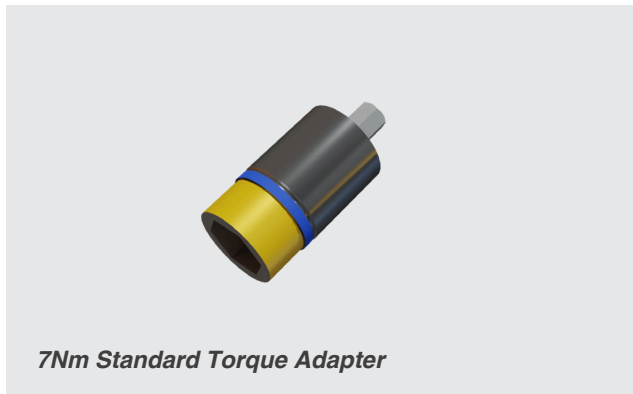


Installation Guide - Tools

Tools to Ensure Correct Torque:



All bolt connections to the top slot of Tate Forte LEC should be tightened to a recommended torque value of 7Nm, using a torque limiting screw gun or torque wrench. Used principally for tightening nuts on drop rod connections.



A torque adapter is another alternative tool to ensure the correct torque in all connections. It can be connected to any bit holder and be equipped with any socket/bit for all bolt applications. It allows for the required torque of 7Nm to be applied to any bolts connection to the top channel of a Tate Forte LEC profile. Used principally for bolt connections. Not to be used with 'impact mode' for power tools.

Installation Guide - Step By Step Installation

Design & setting out consideration

Before installation of Tate Forte LEC, please ensure the following items have been taken into consideration.

1. Every turnbuckle connection to the building structure must be able to support a load of 9kN. This load transmitted through the turnbuckle has no factor of safety. Ensure the connection to the building structure has been adequately designed with the relevant safety factor.
2. Site-specific seismic requirements must be identified and addressed at the design stage. Seismic requirements are outside Tate's scope and are the responsibility of the relevant stakeholder. Tate can provide technical support or input upon request to help interpret or align with these requirements.
3. Perform the appropriate load check for all loads connected to a Tate Forte LEC ceiling system. This will ensure that the position and value of these loads are within Tate's safety guidelines. Load checks should be performed every time a modification to the initial load configuration changes throughout the design and installation phases of a project.
4. A usual Tate Forte LEC Hanger configuration requires a layout of 1.2m x 1.2m. Ensure that the connections to the building structure allows the positioning and the adequate load bearing capacity for these hangers.
5. Please consider the hanger position in regards to the perimeter profile when setting out. Refer to Tate Forte LEC's Standard Details document for more information.
6. Any openings or interruptions of the continuous layout of the ceiling requires additional hanger support.

Refer to the Tate Forte LEC Standard Detail document for more information.

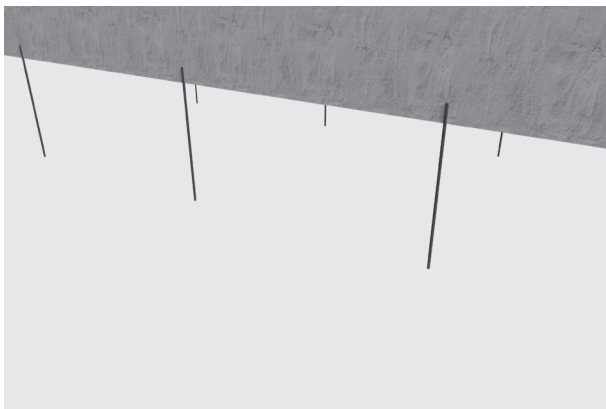
Installation Guide - Step By Step Installation

Tate Forte LEC has two install method options. Starting position (field or perimeter) will depend on the project preference.

Option 1 – Stick type field installation (preferred method)

Hanger configurations of the Tate Forte LEC system can be project specific, and may vary from the standard 1200x1200mm configuration. Please refer to the technical data sheet for performance details.

Step 1



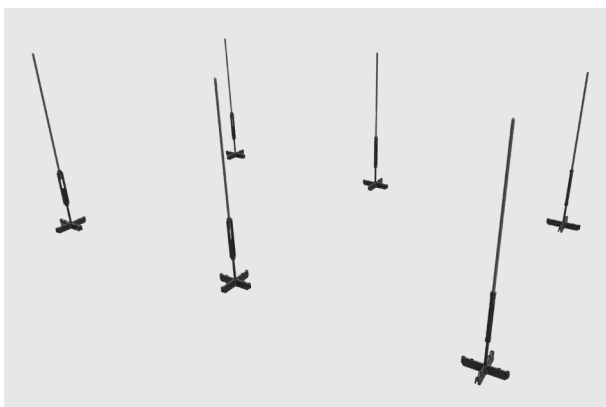
Mark location points of hangers and fix threaded rods to the Building Structure, in a 1200mm x 1200mm configuration.

Step 2



Connect the turnbuckle + starter rod to the previously installed threaded rods.

Step 3



Screw in the connectors to the starter rod. Engage the starter rod fully into the connector. All connectors should be rotated so the connector pin will be perpendicular to the main runner and aligned with the notches.

Note:

Please select the correct connector attending to the below:

- Junction between cross tees and main runners - XL Connector
- Along the perimeter or openings - Perimeter Connector
- At corners - Corner Connector (Perimeter extrusion to perimeter extrusion only)
- For any other location along the profile - Dual Straight Connector's can be used on a 600mm hanging configuration

For more information refer to the Tate Forte LEC Standard Detail Document

*Go to "Installation Guide - Installing the perimeter" for further details

Installation Guide - Step By Step Installation

Step 4



Install main runners at 1.2m distance. Main runners are not symmetric. Always install them in the same position to keep the notches at 600mm apart.

Step 5



Align the Notches on the main runner with the XL connectors. The pin and ribs of the connector will ensure alignment.

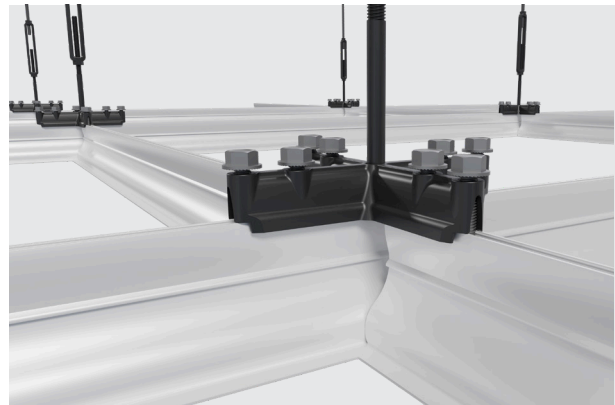
Note: When correctly in place, the connector should not be able to slide along the main runner.

Step 6



Using only Tate's supplied screws, hand tight the screws to keep the main runners in place. Install the bolts only halfway for easy installation of cross tees.

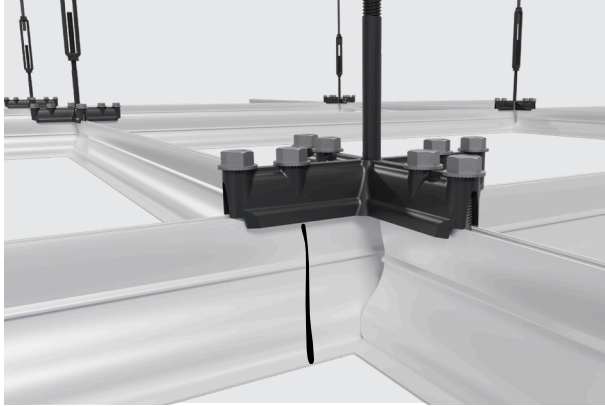
Step 7



Install the supported cross tees aligned with the connectors every 1.2m.

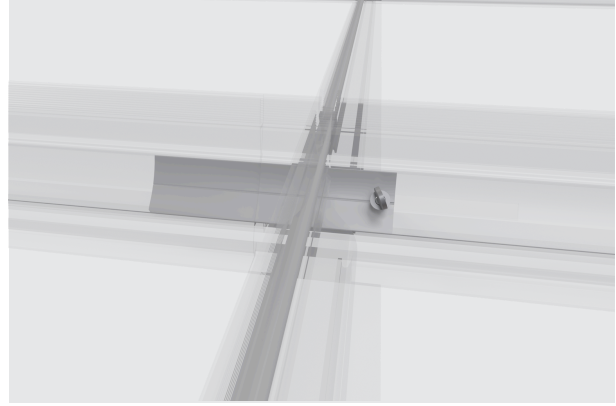
Installation Guide - Step By Step Installation

Step 8



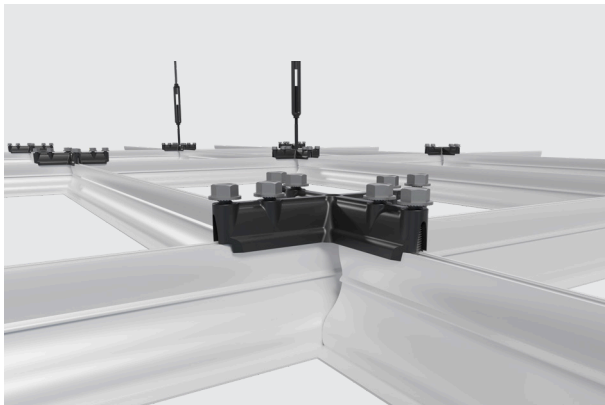
Tighten all screws to the correct 7Nm torque. Splice can now be engaged.

Step 9



Pre-assembled telescopic splice must be used at all main runner splice points. By loosening the thumb screw, slide the telescopic splice to the end of the slot and tighten the screw to lock it in position. The main runner can now transfer load from one main runner to another.

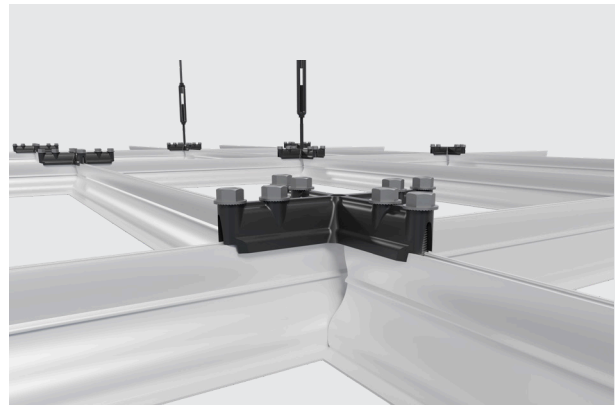
Step 10



Place the remaining cross tees at 600mm distance. Hold in place by using a XL connector at the junction point with the main runners. Install the bolts only halfway for easy installation of cross tees.

Note: The notches on the main runner indicate the cross tee position.

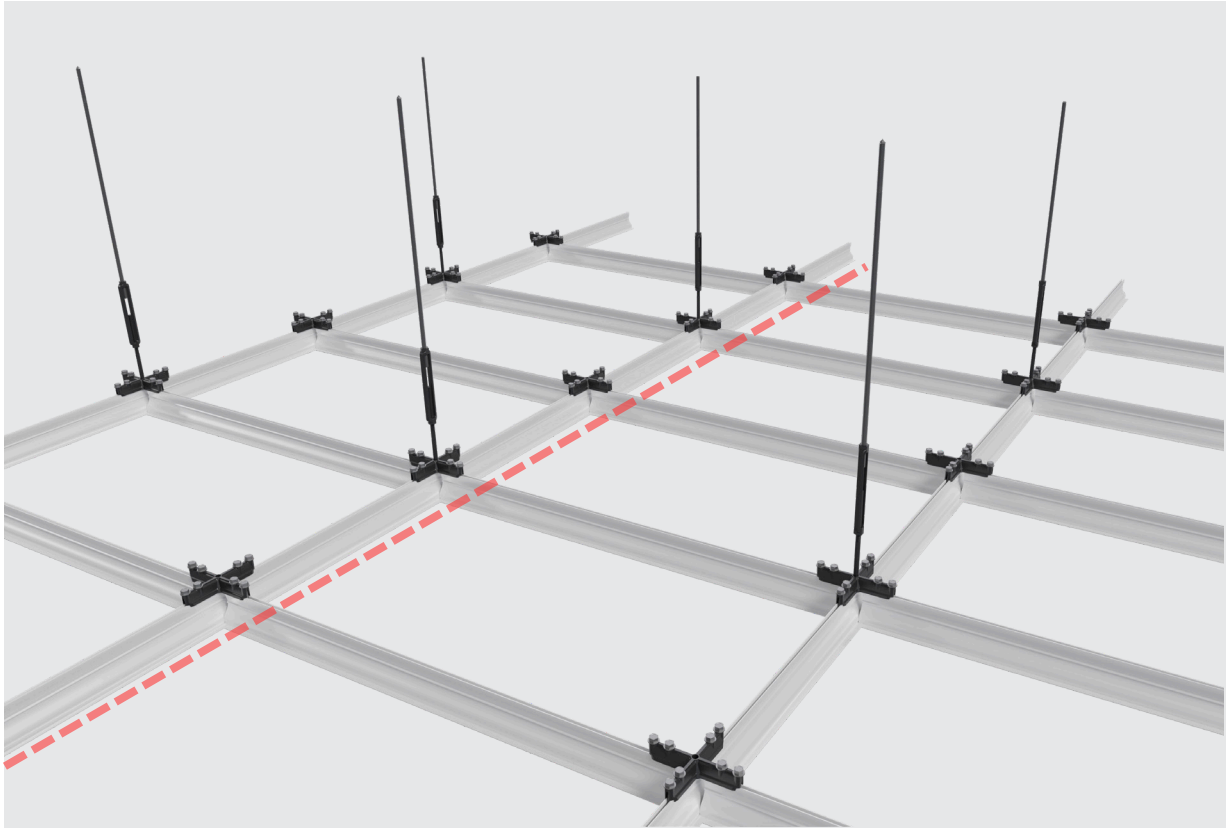
Step 11



Using only Tate supplied screws, tighten all bolts to the correct 7Nm torque.

Installation Guide - Step By Step Installation

Step 12



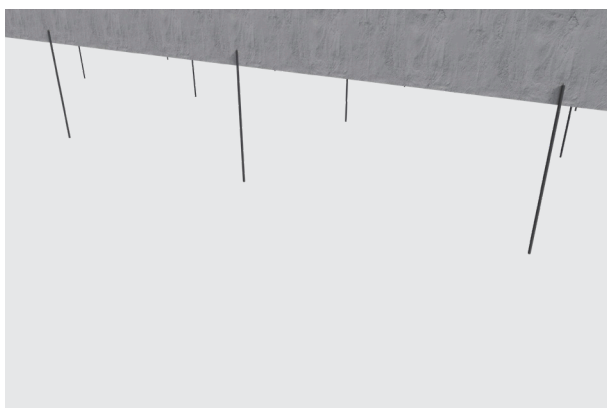
Repeat the process until all main runners and cross tees have been installed. Using a laser, adapt the height of the ceiling by turning the turnbuckle so that it is levelled.

Installation Guide - Step By Step Installation

Option 2 – Ladder type field installation

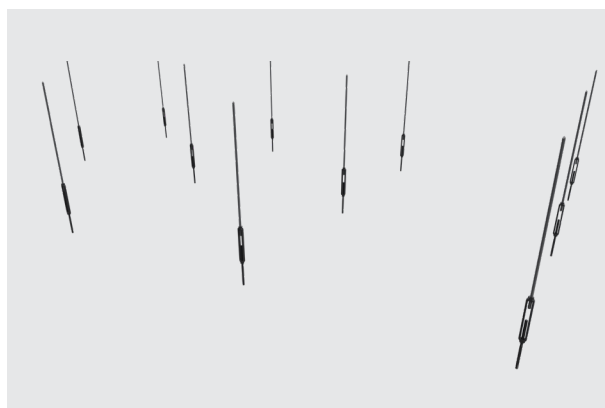
Hanger configurations of the Tate Forte LEC system can be project specific and may vary from the standard 1200mm x 1200mm configuration. Please refer to the technical data sheet for performance details.

Step 1



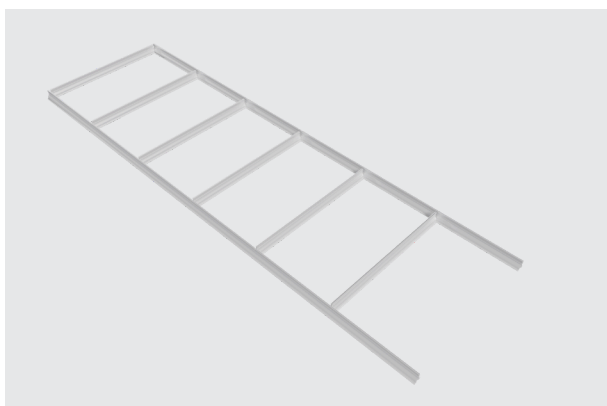
Mark location points of hangers and fix threaded rods in a 1200mm x 1200mm to the Building Structure.

Step 2



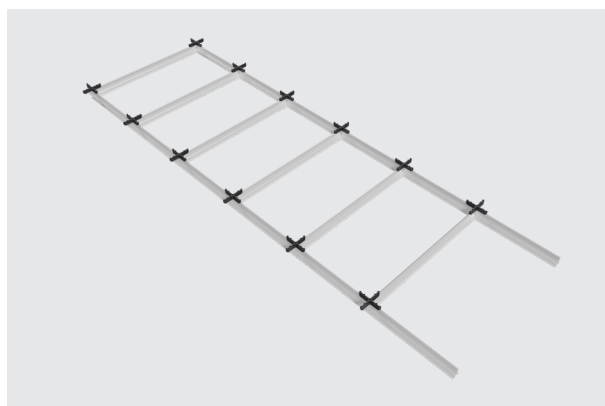
Connect the turnbuckle + starter rod to the previously installed threaded rods.

Step 3



Assemble two main runners and 6 cross tees on the ground. Refer to the 3.6m x 1.2m grid illustrated above.

Step 4

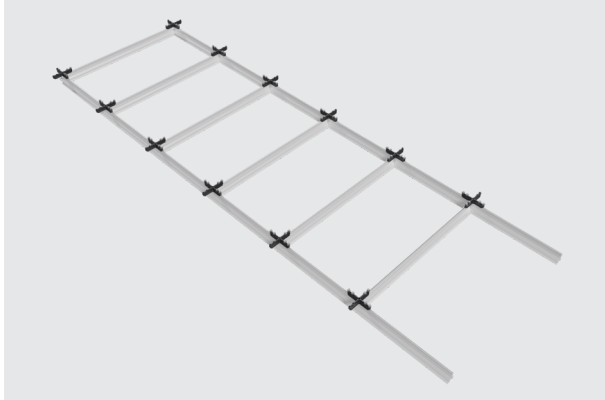


Lay an XL connector at the junction between the cross tees and main runners. The notches on the main runners indicate the junction point.

Note: When correctly in place, the connector should not be able to slide along the main runner.

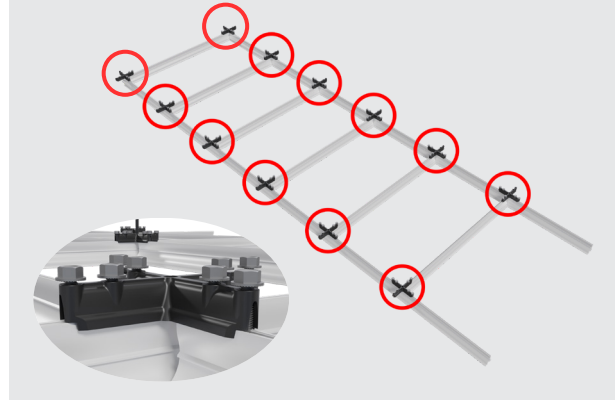
Installation Guide - Step By Step Installation

Step 5



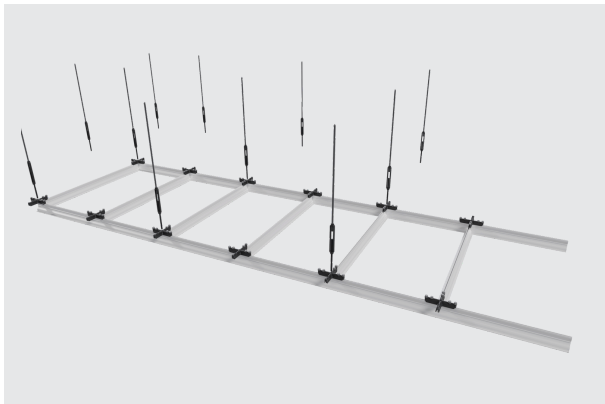
Using Tate's supplied screws, hand tight the screws to secure the connections.

Step 6



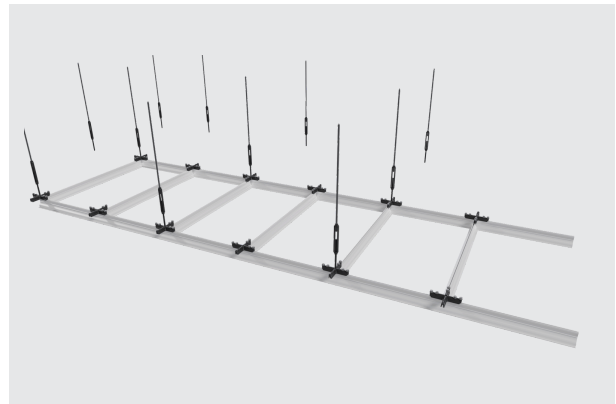
Install the bolts only halfway for easy installation of cross tees in between ladders. Remember to tighten at 7Nm once the ceiling is assembled (see step 11).

Step 7



Lift the assembly to reach the desired height of the ceiling.

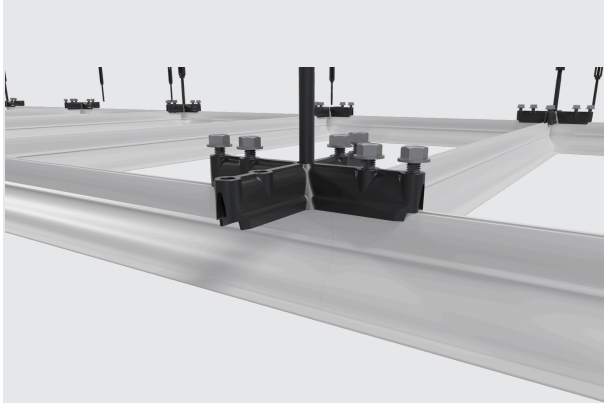
Step 8



Connect the starter rod to the connectors. Engage the thread fully.

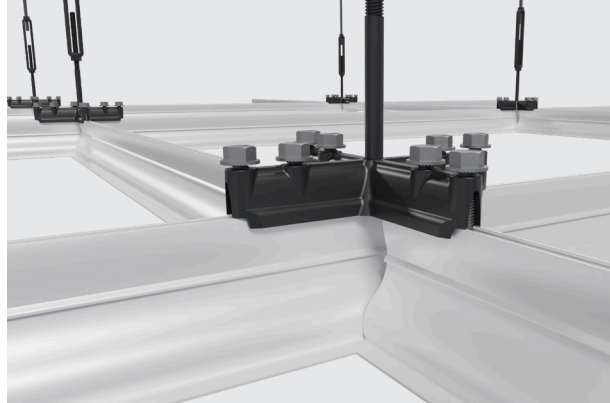
Installation Guide - Step By Step Installation

Step 9



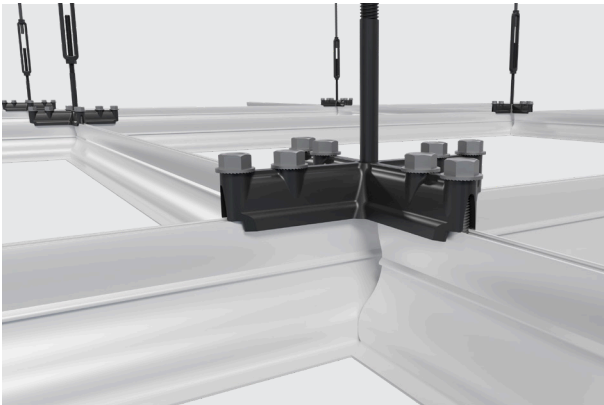
Connect the main runners at the splice point inserting Tate's supplied screws into the connectors. Install the bolts only halfway for easy installation of cross tees. Repeat steps 3 - 9 until all ladders are complete. Telescopic splice will be engaged in step 12, when all bolts are tightened.

Step 10



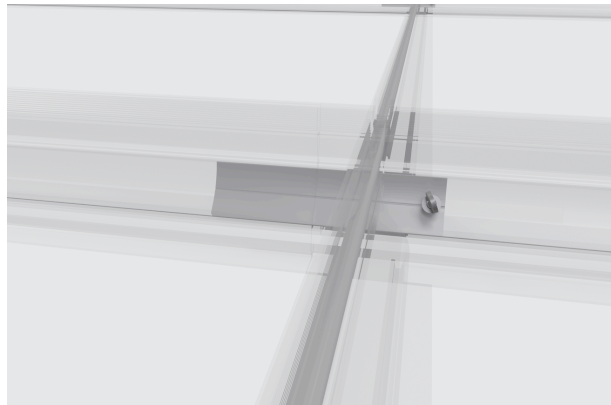
Install the remaining cross tees in between all ladders with the connector's every 0.6m. Install the bolts only halfway for easy installation of cross tees.

Step 11



Tighten all screws to the correct 7Nm torque. Splice can now be engaged.

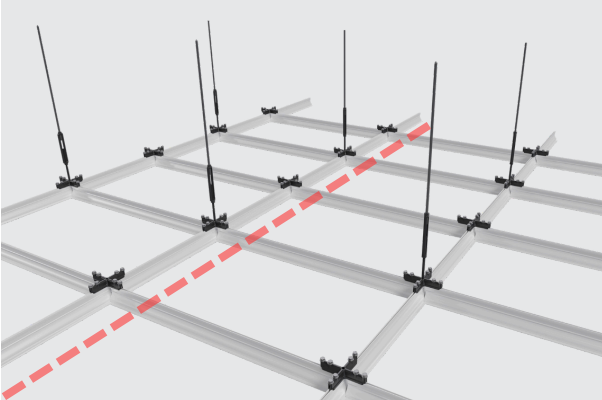
Step 12



Preassembled telescopic splice must be used at all main runner splice points. By loosening the thumb screw, slide the telescopic splice to the end of the slot and tighten the screw to lock it in position. The main runners can now transfer load from one main runner to another.

Installation Guide - Step By Step Installation

Step 13



Using a laser adapt the height of the ceiling turning the turnbuckle so that it is leveled.

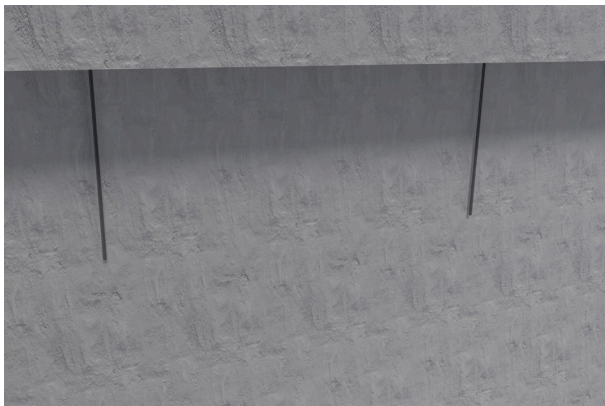
Installation Guide - Step By Step Installation

Installing the Perimeter

Where the wall composition and layout of the ceiling grid allows it, the Tate Forte LEC 3.6m fixed perimeter profile can be screwed directly onto the wall. The fasteners connecting the perimeter profile to the wall are supplied by others. Fixed perimeter profiles come in 3.6m lengths.

Perimeter connector has a 20mm offset hole. Integrated with the fixed perimeter profile, the connection point is offset 39mm from the wall, to the center of the turnbuckle.

Step 1



Mark location points of hangers and fix threaded rods on 1200mm spacing configuration to the building structure.

Note: Turnbuckle is offset 39mm from wall.

Step 2



Connect the turnbuckle + starter rod to the previously installed threaded rods.

Step 3



Along the perimeter, screw in the perimeter connectors to the starter rod. Engage the starter rod fully into the connector.

Step 4



At the corners, screw in the corner connectors to the starter rod. Engage the starter rod fully into the connector. If the closest offset perimeter connector is supported by a turnbuckle in the X and Y axis, the corner connector can be unsupported.

Note: The corner connector can only be used when joining two perimeter extrusions at a corner junction.

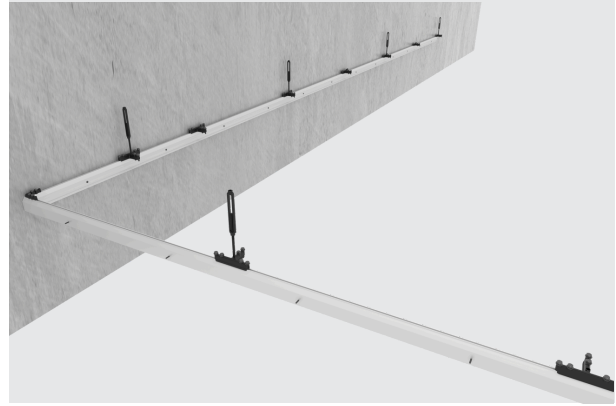
Installation Guide - Step By Step Installation

Step 5



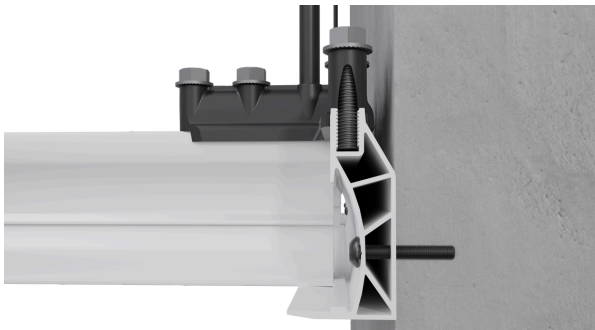
Lift the fixed perimeter profile to meet the hangers. Using Tate's supplied screws, tighten to the required torque of 7Nm.

Step 6



Screw the perimeter directly onto the wall by drilling into the middle of the profile. The extrusion has a positioning rib to indicate where to drill. 600mm spacing is recommended.

Step 7



Main runners or cross tees are installed on top of the perimeter extrusion flange to provide structural support.

Note: No coping is required. Factory supplied cope on the cross tee will need to be cut off.

Installation Guide - Step By Step Installation

Tiles Installation

The table below shows the tile size depending on Tate Forte LEC's grid configuration.

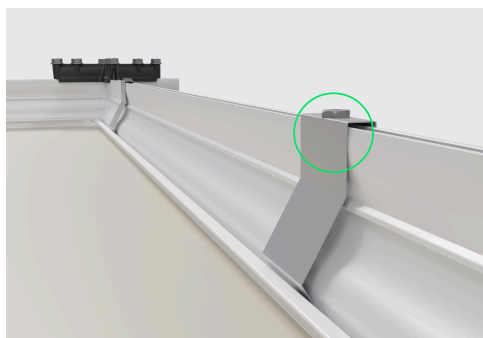
Span (centre to centre of cross tees)	Tile Size
1200 x 600	1153 x 553 ± 3mm
600 x 600	553 x 553 ± 3mm

Appropriate clips need to be selected to suit different types of tiles. Contact a Tate representative for further information.

Tate recommends the following number of clips per tile.

Tile size (nominal)	Clips on cross tee side	Clips on main runner side	Total
1200mm x 600mm	4	0	4
600mm x 600mm	2	0	2

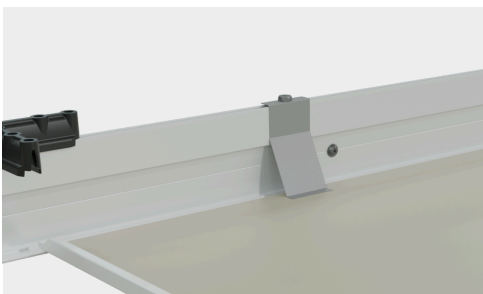
* The adequate number of clips should be decided according to the operating pressure of the data centre.



Clip installation - Screw Down

Install clips by screwing the m8 bolt into the top thread of the extrusion.

Note: Clips are supplied with the bolts built in.



Clip installation - Security Hold Down

Install clips by screwing the m8 bolt into the top thread of the extrusion.

Note: Clips are supplied with the bolts built in. This clip should be used on all cut tiles.

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