# Tate, Inc.
# Tate Duo Data Center Structural Ceiling

## SECTION 09 54 00
## SPECIALTY CEILINGS

## PART 1. GENERAL

### 1.1 WORK INCLUDED

A. Section Includes: Extruded aluminum suspended ceiling grid system including:
   1. Aluminum ceiling grid.
   2. Grid connectors and fasteners.
   3. Wall angle and edge trim.

B. Related Sections:
   1. Section 09 51 00 – Acoustical Ceilings
   2. Section 09 51 13 – Acoustical Fabric-Faced Panel Ceilings
   3. Section 09 53 00 – Acoustical Ceiling Suspension Assemblies
   4. Section 09 20 00 – Plaster and Gypsum Board
   5. Section 02 42 00 – Removal and Salvage of Construction Materials
   6. Divisions 23 – HVAC Air Distribution
   7. Division 26 – Electrical

### 1.2 DESIGN REQUIREMENTS

A. Ceiling system shall be capable of directly supporting cable trays, electrical busways, utilities, manifolds, light fixtures, HVAC registers and other accessories as indicated per area of work.

B. All components of the Tate Duo aluminum structural grid system shall be provided by one (1) manufacturer to ensure single source responsibility, testing and quality.

### 1.3 REFERENCES

A. GENERAL
   1. Comply with applicable requirements of the following, except where more stringent requirements are indicated by Building Codes.

B. ASTM (American Society for Testing and Materials)
   1. Aluminum Standards and Data by The Aluminum Association

C. International Building Code

D. ASHRAE Standard 62 1 2004 Ventilation for Acceptable Indoor Air Quality

E. NFPA 70 National Electrical Code

F. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

G. LEED – Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings.

H. CISCA – Test Procedures for Aluminum Structural Ceiling Grids

### 1.4 WARRANTY

A. Structural ceiling shall be warranted against defects in materials and workmanship for a period of (10) years from shipment.

# PART 2. PRODUCTS

## 2.1 MANUFACTURERS

A. Basis of Design: Product specified is the Tate Duo Structural Ceiling as manufactured by Tate, Inc.

## 2.2 DESIGN FEATURES: Structural Ceiling grid shall include the following features:

A. Nominal 2´ x 2´, 2´ x 4´, or 4' x 4' centered grid system with continuously dual-threaded slot to accept both ½"-13 OR 3/8"-16 threads. System may be configured as exactly 2´ x 2´, 2´ x 4´, or 4' x 4' on center which would require custom, smaller sized ceiling tiles and light fixtures, **OR** 24-5/8" x 24-5/8" / 24-5/8" x 48-5/8" / 47-5/8" x 47-5/8" grid spacing modules to accommodate standard/typical sized ceiling tiles and light fixtures (*other layouts are available*).

B. Nominal 12´ Main Runners and 4´ Structural Tees shall be notched on nominal 24" centers for easy system installation and positive positioning of nominal 24" and 48" Structural Tees.

C. Connectors to include opening for use with alignment tool to align system with grid notches on nominal 24" OR 48" center for ease of installation.

D. Nominal 24" and 48" Structural Tees shall be cut back for vertical support through flange grid contact to 12' Main Runners

E. System is capable of fitting custom sized 23-1/8" square OR 23-1/8" × 47-1/8" (+/- 1/8") ceiling tiles, light fixtures and HVAC registers.

F. Connectors include ½" -13 threaded turnbuckle connections

G. Connectors shall be constructed of high strength steel parts.

H. Internal Splice Connector shall be utilized for nominal 12´ Main Runner splice locations.

I. Optional gasket: 3/32" thick x 3/8" closed cell polyethylene gasket tape shall be provided to improve leakage through system at various air pressures.

J. 3/8˝- 16 button head Philips head screws with lock washer shall be utilized to secure connectors to Main Runners, Structural Tees, and Perimeter Angles.

K. System Weight: i. 2'x2' Grid: 1.1 lb/ft$^2$
ii. 2'x4' Grid: 0.9lb/ft$^2$

## 2.3 STRUCTURE

A. Structural Ceiling grid shall be installed with **a Fixed** or **Floating** perimeter angle condition option and on a **nominal 2 ´ x 2´** OR **2 ´ x 4 ´** grid supported with spacing of **Custom Size** connection to structure above.

B. Main Runners, Structural Tees, and Perimeter Angles shall be constructed of 6063-T6 extruded aluminum and have a **white or black painted aluminum** finish.

C. Connectors: Field, Hanging, and Perimeter connectors shall be constructed of steel with black powder coated finish.

D. Ceiling system shall be capable of supporting a uniform load up to 112 lbs/ft$^2$ with a 4' x 4' hanger spacing, up to 90 lbs/ft$^2$ with a 5' x 4' hanger spacing, up to 75 lbs/ft$^2$ with a 6' x 4' hanger spacing, up to 64 lbs/ft$^2$ with a 7' x 4' hanger spacing, and up to 56 lbs/ft$^2$ with an 8' x 4' hanger spacing

E. Ceiling system shall be capable of a maximum safe working point load of 800 lbs with a 4' x 4' hanger spacing, 500 lbs with a 5' x 4' hanger spacing, 400 lbs with a 6' x 4' hanger spacing, 250 lbs with a 7' x 4' hanger spacing, and 150 lbs with an 8' x 4' hanger spacing

F. Ceiling system shall be capable of an ultimate point load of 1,600 lbs with a 4' x 4' hanger spacing, 1,000 lbs with a 5' x 4' hanger spacing, 800 lbs with a 6' x 4' hanger spacing, 500 lbs with a 7' x 4' hanger spacing, and 300 lbs with an 8' x 4' hanger spacing

G. Turnbuckle connection shall be capable of a maximum point load connection to building structure of 3,600 lbs.

H. Ceiling system load capacity shall be designed to provide a 2x safety factor.

# PART 3. EXECUTION

## 3.1 EXAMINATION

A. Verify ceiling support rod anchors are properly installed in structure above.

## 3.2 MANUFACTURER SUPPORT

A. Prior to installation, the manufacturer shall make training available upon request to the installer.

B. Manufacturer to provide online training modules upon request.

C. Manufacturer to review structural ceiling installation safety methods and techniques

## 3.3 STRUCTURAL CEILING INSTALLATION

A. Structural Ceiling grid shall be installed on a **2´ x 2´**OR **2´ x 4´**grid supported with spacing of [**Custom Size]** connection to decking.

B. Support Spacing shall be defined by positioning of turnbuckle connections offset from one another starting from one corner of the interior structural grid assembly and spaced evenly throughout. Additional supports shall be provided as required along the perimeter and at any critical areas or as per seismic or code requirements or considerations.

C. Nominal 12´ Main Runners shall be installed on nominal 48˝centers and all main runners shall be parallel to one another. Nominal 48" Structural Tees shall be installed perpendicular to 12´

Main runners. Finally, for nominal 2´ x 2´ layouts, nominal 24˝Structural Tees shall be installed perpendicular to the nominal 48˝Structural Tees.

D. All work shall be coordinated with all other trades including but not limited to electrical, mechanical, fire protection and furniture.

## 3.4 PERIMETER INSTALLATION

A. Structural Ceiling grid shall be installed with **a Fixed** or **Floating** perimeter condition option.

B. Fixed perimeter installation: Fixed Perimeter extrusions shall be mounted at level height to interior ceiling grid within 0.10˝overall and 0.06˝over any 10´ distance. Perimeter extrusions shall be fastened to perimeter wall with appropriate wall type fasteners. Perimeter extrusions can be field cut with non-ferrous carbide tipped blade. Joints shall fit with no more than .08˝ gaps.

C. Floating perimeter installation: Floating Perimeter extrusions shall be supported from structure at level height to interior ceiling grid within 0.10˝overall and 0.06˝over any 10´ distance. Perimeter extrusions shall be fastened to Main Runners and Structural Tees with perimeter connectors and suspended from structure above. Perimeter extrusions shall be field cut with non-ferrous carbide tipped blade. Joints shall fit with no more than .125˝gaps.

## 3.5 CLEANING

A. Inspect above and below installed ceiling system. Remove paint splatters and other spots, dirt, and debris. Touch-up scratches and mars of finish to match original finish.

END OF SECTION