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ABSTRACT:

Needed for virtually every commercial building, but what type? Metal stud deflection tracks accommodate movement, vertical and lateral. Do you know what criteria govern the track selection? Do you know the questions to ask? Learn what types of track are available and the applications for each.

FILING:

UniFormat®
C1010 - Interior Partitions

MasterFormat®

09 21 16 - Gypsum Board Assemblies
09 22 16 - Non-Structural Metal Framing

KEYWORDS:

Deflection track, single, double, slotted, fire rated, metal studs, interior partitions, vertical movement, seismic movement

ILLUSTRATION CREDITS

(in order of appearance):
MarinoWare - Single Deep Leg deflection track
ClarkDietrich Building Systems - Double deflection track
ClarkDietrich Building Systems - Slotted deflection track
Fire Trak - Fire rated deflection track

Metal Stud Deflection Tracks

By David Stutzman, AIA, FCSI, CCS, SCIP
Hana Nguyenky, AIA, CSI, CDT, CCA, CCS, LEEP AP, WELL AP

Background

In commercial construction, interior partitions are not usually intended to be load bearing. The building frame, whether steel or concrete, resists and transfers the loads to the foundations. When floors and roofs resist live and dead loads, the assemblies deflect (bend) in response to the load. Interior partitions required for fire resistance, sound isolation, security, and other reasons are constructed full height. They extend from one floor to the underside of the floor or roof construction above. If the partitions are installed without provisions to accommodate deflection, these partitions will become load bearing and may bend under the load.

Example

For our example, assume a very simple structure with a square column bay. Structural engineers will design the floor and roof construction with a maximum allowable deflection based upon code required design loads. The deflection limits are usually expressed as a ratio compared to the span "L." Floors may be designed with maximum deflection of L/360 or L/240. Roofs may be designed allowing L/180 maximum deflection. See Table 1. Deflection limits are determined by the use and the perceived bounce

permitted especially for floors. Plus consider what ponding water a roof may retain under maximum deflection, especially when the drains are located adjacent to the column where deflection is near zero. Both the allowable deflection limit and the structural span affect the maximum permitted deflection. Because the building frame permits deflection, any construction connecting two floors or a floor and a roof, must accommodate the movement or be capable of resisting the applied load.

Deflection Tracks

Metal stud manufacturers offer three basic types of deflection tracks: a single deep leg deflection track, a double deflection track, and a slotted deflection track. In addition, proprietary tracks are available for specific purposes, especially for fire rated head of wall joints. There are advantages and disadvantages, including cost, for every track type. UL listed tracks are available for fire rated applications. Proprietary tracks are available for other applications. See 4Specs.com for available manufacturers.

Single Deep Leg Deflection Track

Single deep leg track is a track member with at least 2 inch legs. The studs are inserted into the track

Table 1 - Head of Wall Joint Movement			
Deflection Limit	Maximum Deflection (inches)		
	20 ft Span	25 ft Span	30 ft Span
L/360	0.67	0.83	1.00
L/240	1.00	1.25	1.50
L/180	1.33	1.67	2.00

leaving a gap between the top of the stud and the track. To permit movement in the system, the studs are not fastened to the track. Instead, bridging is installed near the top of the studs to ensure the studs remain aligned.

Advantages: This track is relatively simple to install and will accommodate both vertical and lateral movement.

Disadvantages: This system requires bridging and does not secure the studs against rotation. Some manufacturers provide slotted bridging that snaps into the punched studs, reducing the cost for bridging installation.



Double Deflection Track

Double deflection tracks rely on two separate tracks, one nested inside the other. The outside track with 2 inch legs is fastened to the structure above. The inside track with 2-1/2 inch legs is fastened to the top of the studs, allowing a gap between the two tracks. The inside track is free to move within the outside track.

Advantages: The tops of the studs are secured against rotation and the system allows both vertical and lateral movement.

Disadvantages: The double track can cause a hump in the gypsum board surface and is generally the most expensive option. Manufacturers recommend against double deflection tracks.



Slotted Deflection Track

Slotted deflection track relies on the metal studs being fastened to the track through slotted holes in the track legs. The studs must be fastened so they can slide within the track. Over tightening the fasteners will prohibit movement.

Advantages: This is the simplest track system to install.

Disadvantages: This track does not accommodate any lateral movement. Exposed slots permit direct path for sound transmission between adjacent rooms.



Conclusion

Ask your structural engineer what deflection limits are used for the building frame design. Calculate the maximum deflection partitions must accommodate.

Consult your structural engineer about the type of movement required.

Deflection tracks may need to take vertical and lateral movement.

Consider everything relating to the structure movement. Then select the deflection track for movement types and ranges to meet your project needs. Remember different tracks may be required for different purposes.

When having difficulty deciding what to do...ask your specifier.

Caution: To permit deflection, gypsum board and applied finishes attached to the studs must not be fastened to the deflection track. During construction, ensure no fasteners are installed along the top edges of the gypsum panels.

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