

TECHNICAL BULLETIN

Structural Design of Glass Entrances

In an door entrance that utilizes a glass transom that is supported by a mechanical device connecting the bottom corners of the transom to the adjacent sidelite, which also acts as the doors' top pivot (Transom-Sidelite Link w/ Pivot), several design features must be considered. Because the hardware and sidelites must support the weight of the transom as well as the lateral forces exerted on the sidelite when the door is in the open position, such factors as the width of the adjacent sidelite, height of the transom, and 2-sided versus 3-sided support must be considered.

If the sidelite is supported at the head and sill only (2-sided support) then it must be of adequate width to resist lateral loads, and thus deflection, when the door is opened. Should the sidelite be supported along the jambs in addition to top and bottom (3-sided support) then the sidelight will deflect much less under lateral loads and therefore can be narrower and/or support taller transoms. Three-sided support can also be achieved with the use of another sidelite positioned at a 90° angle to the panel adjacent to the door. In this application the two panels forming the corner must be connected with structural silicone or other mechanical devices. In both 2- and 3-sided support applications the lateral deflection becomes greater as the height of the transom increases.

Stabilizer Fins—

If the height of a transom is too great, or the width of the sidelite too narrow, then the strength of the sidelite might not be enough to support the deflection (flexing) of the sidelite when the door is opened thus allowing the bottom edge of the door to drag on the floor. When this occurs it is either necessary to secure the jamb of the sidelite to provide a 3-sided support (see Three-Sided Support requirements for Stabilizer Fins below) or utilize glass stiffeners or fins to resist the lateral load placed on the sidelite. The charts below will assist in determining when stabilizer fins are recommended, and the required size.

In all cases, it is imperative that the top of the stabilizer fins be mechanically fastened to a structural member at the head. Heavy-duty fin brackets are available for this purpose, or material of equal integrity and design can be used. For fins less than 36" in height two through-bolts are usually adequate support. Three or more bolts are recommended for fins greater than 36." NOTE: GLAZING CONTRACTOR WHO ELECT TO OMIT STABILIZER FINS WHEN MANUFACTURER RECOMMENDATIONS CALL FOR THEM ARE ACCEPTING FULL RESPONSIBILITY FOR THE DESIGN AND FUNCTION OF THE ENTRANCE, AND FOR ANY FAULTY OR DEFECTIVE PERFORMANCE OF THE SUPPLIED MATERIALS.

Interior Entrances

The following information is designed as a guideline when considering the limitations and design of an interior All Glass Entrance. Because most interior entrances are designed with ½" tempered glass, the design parameters below are for ½" tempered glass. **Exterior entrances** should be analyzed by design professionals essentially the same way as for any curtain wall or storefront application.

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Transom—

If transom weight exceeds 100 Lbs. it should be mechanically fastened at the head to an adequate structure. This is necessary whether the sidelights are supported on two- or three-sides. Heavy-duty transom brackets are available for this purpose or we can provide holes along the top edge for use with the glazier's hardware.

Two-Sided Support Sidelight—

Based upon the recommendations of the Glass Association of North America, the maximum height of tempered glass sidelite panels supported at the head and sill only is shown in Fig. 1. The minimum width of a sidelite used to support a transom and door pivot in a 2-sided support application is 12.”

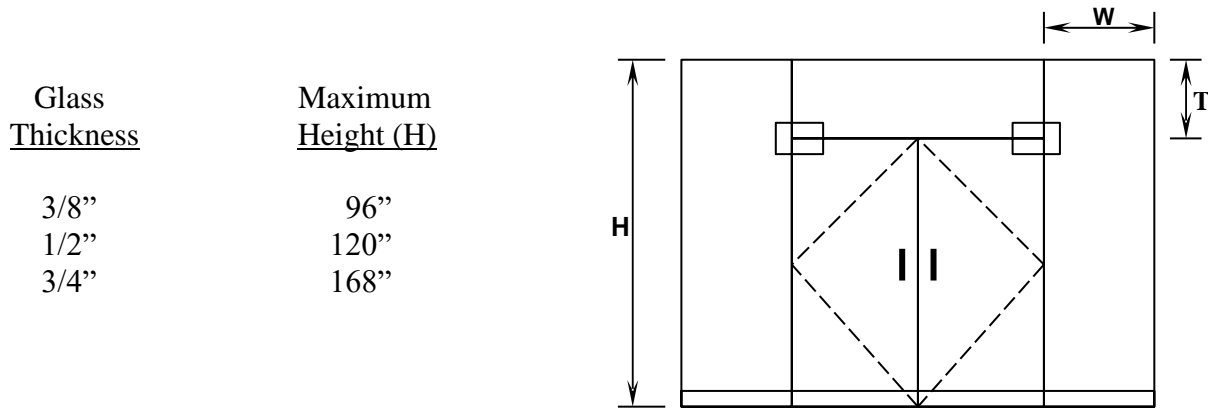


Figure 1
Recommended Maximum Height of Two-Sided Support Sidelights

To determine the need for stabilizer fins for an entrance locate the sidelight width (*W* in Fig. 1) on the X axis of the chart in Figure 2 and the transom height (*T* in Fig. 1) on the Y axis of the chart in Figure 2. Establish their point of intersection within the chart. If this point is below the door width reference line, based upon the standard widths of either 36” or 42”, then stabilizer fins are not required. If this point is above the door width reference line, however, then stabilizer fins are recommended.

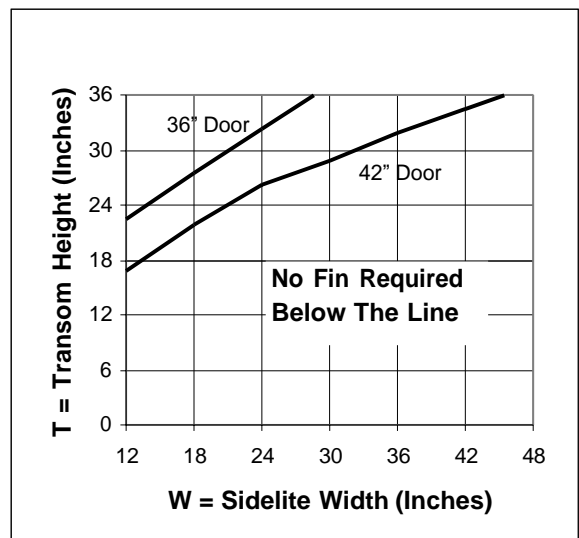


Figure 2
Fin Recommendation for Doors and Transom with 2-sided Support

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Three-Sided Support Sidelight—

The recommended calculation for determining the necessity for stabilizer fins in an opening that has a sidelite supported at the jamb, in addition to the head and sill, is the following:

Sidelite width (W in Fig. 1) + Transom height (T in Fig. 1) < 72" then Fin is NOT Required

Sidelite width (W in Fig. 1) + Transom height (T in Fig. 1) > 72" then Fin IS required

The maximum height recommendation for an unsupported edge of ½" tempered glass is shown in Figure 1 above. If one vertical edge is supported at the jamb (3-sided support) the height can be increased. Through the use of stabilizer fins the maximum height can be increased to as much as 168."

Fin Size Recommendation—

When stabilizer fins are recommended (as per the above guidelines) a minimum fin width (F in Fig. 4) of 12" will provide adequate lateral support for transoms up to 24" high. Transoms taller than 24" will require a wider fin for increased support. The recommended width can be determined from locating the height of the transom (T in Fig. 4) on the Y axis of the chart in Figure 3 below. Draw a horizontal line from this point on the Y axis to the bold line on the right side of the chart. Determine this point's location above the X axis to determine the recommended fin width.

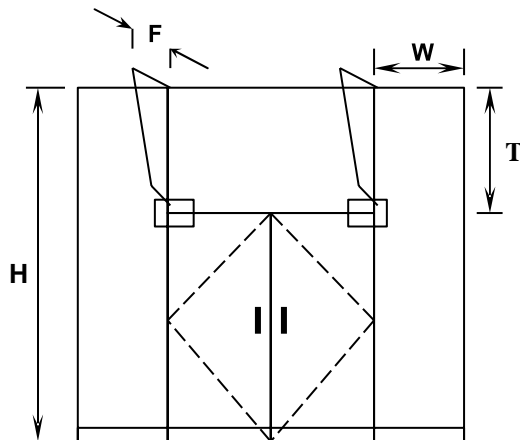
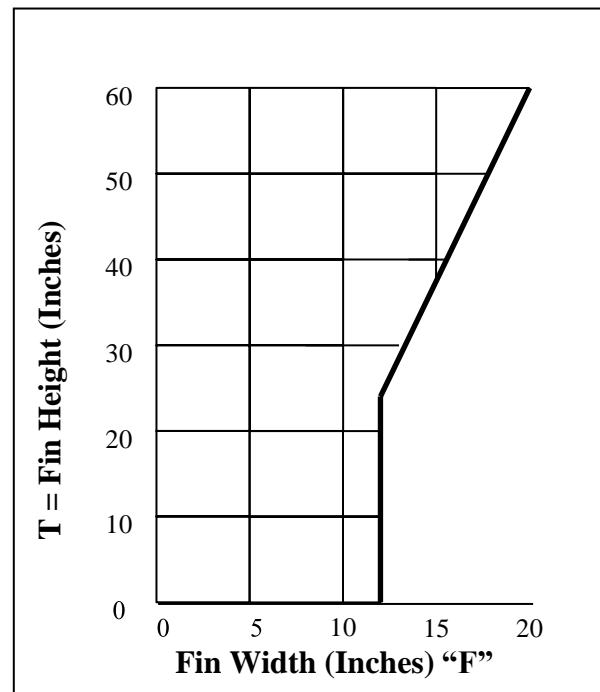


Figure 4



**Figure 3
Stabilizer Fin Width Recommendation**

NOTE: Although we will offer as much assistance as possible, our involvement must be understood as informal and limited to providing information for the customer's review and final approval by the structural engineer, architect, or other design professional. Design criteria such as integrity, strength, thermal movement, air infiltration, static pressure, and other structural considerations are the sole responsibility of the customer, glazing contractor, structural engineer, and/or architect.