engineer's notebook

Lally Columns in Residential Construction

By Jim DeStefano

Lally columns are commonly used in residential construction for supporting wood or steel girders. They are available in 3 ½ inch and 4 inch diameters. Lally columns are manufactured from 16 gage steel tubing, which is filled with concrete.

Lumber yards and building material suppliers stock lally columns in various lengths, ranging from 6 feet to 12 feet. Carpenters can easily cut them to exact length in the field without the need for any special tools.

Loose cap and base plates fabricated from 9 gage steel are supplied with the columns. Each cap and base plate has four raised lugs, which hold it in position on the column. Pre-drilled holes are provided to allow for nailing the plate to the supported girder. The plates can be welded to the column, but are more commonly left loose.

Column Load (kips)				
Unbraced Length	3½" diameter		4" diameter	
	P_U Ultimate	P_A Allowable	P_U Ultimate	P_A Allowable
6'	13.4	8.8	17.4	11.4
7'	12.9	8.5	16.9	11.1
8'	12.4	8.2	16.3	10.7
9'	11.8	7.8	15.7	10.3
10'	11.1	7.3	15.0	9.9
11'			14.3	9.4
12'			13.4	8.8

Lally columns are intended for interior use only. The thin outer steel shell is very vulnerable to corrosion. They should never be used in an application, which exposes them to the weather, constant moisture, or corrosive chemicals. In basements susceptible to frequent flooding, column bases should be elevated on masonry pedestals.

Lally columns are engineered to resist concentric vertical loads. They are inefficient at resisting lateral loads or flexural forces. Consequently, they should not be used in exterior walls or other situations where they may be subjected to substantial lateral loads.

Lally Column Load Table

The column loads were calculated based on the AISC LRFD Specification for Structural Steel Buildings. It is recognized that the column load is never applied perfectly concentric to the column axis. Consequently, the column load was assumed to be applied with a 1 inch eccentricity. To convert ultimate loads to allowable loads, a live load/dead load ratio of 4:1 was assumed.

The following material properties were assumed:
- steel yield strength F_y = 33 ksi
- concrete compressive strength f'_c = 3000 psi

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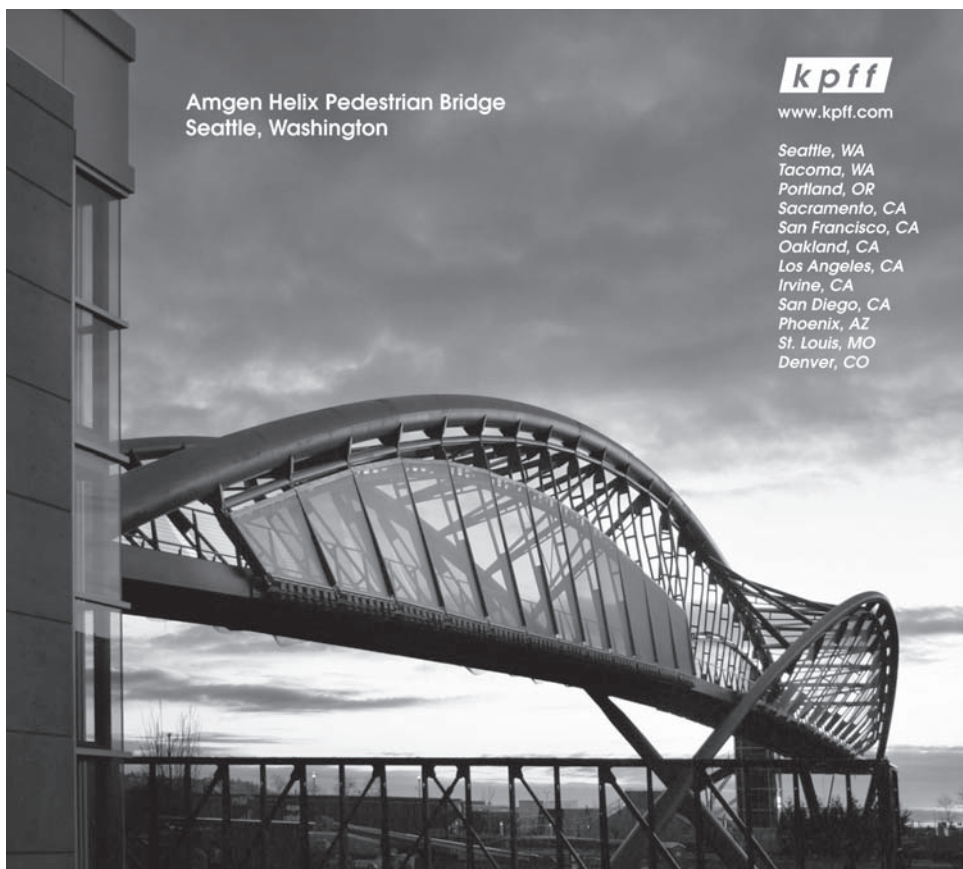
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