You might have seen some of these headlines over the past few months:

December 20, 2004—Engineering News Record projects 10% increase in structural steel prices in 2005

January 3, 2005—Wall Street Journal reports steel prices could drop by $200 a ton in 2005

January 14, 2005—The Kiplinger Letter: “Steel prices will rebound by early spring after a slight drop this winter.”

January 17, 2005—Engineering News Record reports study projects $200 drop in steel prices

Confused? You are not alone! Design and construction professionals are approaching the 2005 construction market much like Punxsutawney Phil, the famous Pennsylvania groundhog who pokes his head out of his burrow each year in early February. But rather than wondering about the weather, this year’s question is, “Will the volatility in the price and availability of construction materials we experienced in 2004 continue into 2005?” The answer is simple—volatility will continue to be present for all construction materials in 2005.

Does this mean the prices for construction materials, including structural steel, are going to increase in 2005? Not necessarily. Volatility is best defined as unpredictability. The only predictable trend we’ll see in 2005 construction material pricing is that it will be unpredictable.

The market for all types of construction materials has changed radically in the past year. No longer are we participating in a domestic market governed by the economics of domestic demand and global supply. This is the measure of the speed at which the supply can reach the end user. Even if excess capacity exists in the production process, availability problems will still exist if that process cannot meet the demand for specific products. Structural steel mills are on an industry standard six to eight week rolling cycle where their product line is produced within a single cycle. In addition, steel service centers stock one million tons of steel (25% of annual demand) of all sizes for delivery on an immediate demand basis. Also impacting the velocity component of a construction material is the availability of transportation to move the material from production locations to project sites. This may be the largest challenge on the horizon for all construction materials.

The Five Vs

When evaluating the market behavior of various construction materials, it is helpful to view that behavior through a defined framework. Perhaps the most helpful framework is that of the five Vs: Volume, Velocity, Variety, Value, and Volatility.

Volume is a measure of the capacity of the market to supply the demand of the marketplace. The concrete industry is dependent on a significant percentage of imported cement to satisfy domestic demand. Overall, nearly 20% of cement used in the United States is imported. In some areas of the country (Florida), over 40% of cement is imported. Recent shipping and supply problems have limited the capacity of the market to supply the growing demand of the construction marketplace. This volume constriction has created allocations and project delays in 29 states.

In contrast, the domestic structural steel industry has an annual capacity to produce nearly six million tons of wide-flange structural shapes. In 2004, domestic demand approached four million tons. This excess capacity translates into adequate volume to meet both the current and long term demands of the domestic market. This is not true of all segments of the steel industry. Capacity restrictions are affecting sheet rolled and plate products, which impact pipe, tube, plate, and sheet metal products.

Velocity is the measure of the speed at which the supply can reach the end user. Even if excess capacity exists in the production process, availability problems will still exist if that process cannot meet the demand for specific products. Structural steel mills are on an industry standard six to eight week rolling cycle where their product line is produced within a single cycle. In addition, steel service centers stock one million tons of steel (25% of annual demand) of all sizes for delivery on an immediate demand basis. Also impacting the velocity component of a construction material is the availability of transportation to move the material from production locations to project sites. This may be the largest challenge on the horizon for all construction materials.

Variety is a measure of the different number of items within a product family that are being used in the marketplace. During 2004, certain materials such as metal studs, reinforcing bars, and post-tensioning strand have been difficult to obtain. Because these products have few variations (a limited number of items within the product family) some contractors, pre-casters, and rebar fabricators...
increases in project costs of 61%. For a typical project, the cost of the total structural steel package (material, detailing, fabrication, transportation, and erection) will represent 10% to 12% of the total project cost. As a percentage of the steel package, the mill material will typically represent 30% to 40%. This means that of total project cost, the structural steel material will account for only 3% to 4%. An increase in mill product costs of 61% will translate into an increase in project cost of about 2%. But the overall project costs are increasing more than 2%. The reason behind the higher rates of increase is that there are many other components that are affected by rising steel prices. Some are included in the steel package (plates, tubes, and metal decking) while others are not (piping, sprinklers, elevators, door frames, HVAC ductwork, and reinforcing bar). When all of these are taken into account, the anticipated increase in project cost is 3.5% per $100 increase in steel price, independent of the framing system used on the project. Because of the amount of reinforcing steel in concrete structural members (often over 50% of the equivalent weight of a steel beam or column), and increases in cement and forming costs, the overall comparative value of alternative structural systems has remained relatively unchanged. The resulting project price increase in 2004 was in the neighborhood of 12% to 15%.

This means that the bottom line for the owner, architect, structural engineer, or general contractor is that when evaluating the value of selecting a particular structural material on a particular project, a current comparison must be made of competing systems rather than relying on traditional rules-of-thumb. In addition, care should be taken to evaluate the total project cost utilizing competing structural systems, not just the structural frame itself. Often, using steel framing can result in reducing foundation and other project costs—these differences must be taken into account.

**Volatility** is the predictability of the price and availability of a construction material. There can be no question that over the past 12 months, all construction materials have experienced significant volatility characteristics. This volatility has manifested itself across the board with all materials. Some materials, notably cement and concrete, have experienced “smoother” price increases while other materials, such as structural steel, have been more erratic in pricing behavior. On the flip side, steel supply has much more predictable than cement and concrete supply.