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Barbara Matejka reviews "Specifying Duplex Systems" for publication in The Construction Specifier

Barbara is on the Editorial Advisory Board for The Construction Specifier, a publication of the Construction Specifications Institute, Alexandria, Virginia. The article, written by Melissa Lindsley, can be found in the August 2013 edition and discusses coatings on steel products (shown in part below).

Barbara is a Certified Construction Specifier and LEED-Accredited Professional in Building Design and Construction. She has been with HHS DR for 27 years and is an Associate with the firm.

HHS DR celebrated its 60th year of providing professional design services to our clients. We Build Relationships by providing responsive, quality services. The Pittsburgh Builders Exchange continues to rank our firm as the most active in terms of projects in the bid phase or under construction.

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Specifying Duplex Systems

Aesthetics and protection with hot-dip galvanized steel and coatings

by Melissa Lindsley
All photos courtesy American Galvanizers Association

BRIGHTLY PAINTED STADIUMS IN TEAM COLORS. RAINBOW-HUED ARTISTIC SCULPTURES. INSTANTLY RECOGNIZABLE SAFETY MARKINGS—ALL THESE ITEMS CAN BE HIDING A POWERFUL SECRET: BENEATH THEIR VIBRANT PAINT OR POWDER COATINGS: HOT-DIP GALVANIZED STEEL.

Hot-dip galvanizing is the process of dipping fabricated steel into a kettle or vat of molten zinc. The process is inherently simple, which provides a distinct advantage over other corrosion protection methods. While the steel is in the kettle, the iron in the steel metallurgically reacts with the molten zinc to form a tightly-bonded alloy coating that provides superior corrosion protection to steel. In the duplex method discussed throughout this article, the hot-dip galvanized steel adds the benefit of durable, low-maintenance corrosion protection beneath a superficial coating.

Though many people are familiar with one or the other type of corrosion protection system, few realize the intrinsic value of using both in tandem—a duplex system—to grant a project the protection of hot-dip galvanized steel, while allowing a desired color/aesthetic using paint or powder coating.

It is a common misconception to think painting or powder-coating over galvanizing is difficult or not worth the extra step. To the contrary, it is often possible to duplex with minimal additional effort, and the results can greatly extend the project's life. A duplex system can withstand some of the toughest environments imaginable, with little to no maintenance. In fact, due to the synergistic effect, a structure can last up to 2.5 times longer, maintenance-free, by incorporating a duplex system. By following a few simple preparation steps outlined in ASTM specifications, a galvanized piece can be painted or powder-coated to meet any color requirement.

Duplex applications

A duplex system can be applied to structures from public and private sectors; everything from radio towers, bridges, pipes, stadium structures, and artistic sculptures can successfully implement a system of paint or powder coating over galvanized steel. Specifiers may elect to call for duplex for numerous reasons, but 'aesthetics' is often the chief one. For instance, many sport stadiums want to take advantage of durable hot-dip galvanized steel, but need to feature team colors in the stands or bleachers. Painting or powder coating over galvanized steel allows the best of both worlds.

Perhaps the structure is meant to blend in to the surroundings, or maybe to stand out with a vibrant color, as with the Chinatown Park Entrance Gate on page 44. Duplexing opens up a world of visual options, without sacrificing low-maintenance corrosion protection.

A duplex system also might be used to accommodate safety regulations. Duplexing can enable the color-coding of gas, steam,

or chemical pipes. It can also identify hazardous work areas and walkways, and mark high-voltage electrical lines and equipment. For example, the Federal Aviation Administration's (FAA) requires structures taller than 61 m (200 ft) to be painted in the alternating pattern of white and international orange. Duplexing these types of projects will ensure the proper color-coding is in place without sacrificing corrosion protection on often difficult to maintain structures.

Perhaps more important than superficial appearance concerns, an overlooked benefit of duplexing is the extended corrosion resistance. When galvanized steel is painted or powder-coated, the system provides a more sophisticated manner of corrosion protection through a synergistic effect. The exterior layer of paint



The Thurston Avenue Bridge on Cornell University's campus (Ithaca, New York) showcases a duplex system of galvanized steel and powder coating.

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