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NX INFRASTRUCTURE STAINLESS STEEL CLAD DOWELS

The new standard for corrosion resistant load transfer dowels.

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NX is a Stainless Steel Clad Composite with a Carbon Steel Core

NX Infrastructure Limited (NXIL) is a unique steel company using advanced technology to produce high quality infrastructure materials. It is headquartered in South Wales, United Kingdom.

The Company is distinguished by its patented and fully integrated stainless steel bar-cladding process, leading the world in producing a composite stainless steel cladded carbon steel. This stainless steel alternative is known as NX-SCR™.

NX Stainless Clad Dowels (NX-SCD™) are made through a patented “green” process, which results in a metallurgical bond during hot rolling between a durable outer stainless steel cladding and a carbon steel core.

NX-SCD are designed to optimize the very high corrosion resistance of stainless steel with the yield strength and elastic modulus characteristics of low alloy carbon steel, with the lowest life cycle cost in the industry.

Applications

Long-term pavement performance is a growing issue with many state departments of transportation. The FHWA study No. FHWA-RD-96-164 found that all epoxy coated dowel bars exhibited various degrees of corrosion after only 5-10 years. In many cases, the corrosion was sufficient to cause joint lock-up and other pavement distresses.

High Performance Rigid Paving was used in reconstruction of I-35 leading to the “Mall of America” in Minneapolis, one of the most highly trafficked freeways in the US. In excess of 120 tons of 38mm and 44mm diameter NX-SCD were used in this project so as to reach a “60 Year Pavement Life”, setting a new standard in pavement design and construction in the US and raising awareness of long-term performance of concrete pavements.

NX-SCD are an ideal material for longitudinal expansion joints in highway pavements, with their relatively thick stainless steel cladding of at least 0.8mm of stainless steel, compared with epoxy’s thin coating of less than 0.2mm. Wet Corrosion-Abrasion tests resulted in a Resistance Index of 3.62 for stainless steel versus carbon steel’s 1.0 (Material volume loss with increasing abrasion frequency).

Properties and Characteristics

- NX-SCD conforms to AASHTO MP13M/MP 13-04 (2006) Standard Specification for Stainless Clad Deformed and Plain Round Steel Bars for Concrete Reinforcement, which is based on ASTM A 955 and ASTM A 615.
- NX-SCD provide superior corrosion resistance relative to epoxy, galvanized and black bar and have been proven in long term field trials and tests since trials began around 20 years ago. NX-SCD have a superior critical chloride concentration threshold to induce corrosion of over 11.8 lb/yd^3 (7 kg/m^3) in comparison to only 1.2-2.0 lb/yd^3 (0.7-1.2 kg/m^3) for epoxy coated rebar.
- NX-SCD require no maintenance because of the superior corrosion resistance and will therefore eliminate traffic disruption for the lifetime of the highway.
- NX-SCD are chemically pickled to remove all trace of oxide before dispatch.
- NX-SCD have been fatigue tested to 2 million cycles (150MPa-275MPa) with no impairment to the metallurgical bond.
- Our unique manufacturing process provides a high bond shear strength between core and cladding of 300MPa when tested according to ASTM A 263-88.
- An average stainless steel clad thickness of 0.03" (0.8mm) results in a durable outer cladding enabling NX-SCD to be easily welded (using 316 welding wire) into support cages or be handled using normal procedures for black bar, without impairment to cladding integrity.
- Extra-low adhesion of NX-SCD to concrete when coated with release agent.
- NX-SCD are currently available in 1¼" (32 mm) and 1½" (38 mm) diameters, in 20 ft (6.0 m) standard lengths or cut-to-length sections.