Demonstration Project

8-9 NOV 97

Moisture Cure Urethane Paint System on Bridge

Product:

Sherwin-Williams Corothane I Zinc Primer
Sherwin-Williams Corothane I Coal Tar

Discussion:

Corothane I product line is manufactured by Sherwin-Williams Industrial and Marine Coatings. The coatings are moisture cure urethane. The products tested contain micaceous iron oxide which reportedly results in increased abrasion resistance and reduced moisture transmission. Literature indicates application down to 20° F without regard to dew point differential if the surface is dry. Primer requires SSPC SP10 blast cleaning for immersion; SSPC-SP6 for atmospheric and can be used on water assisted abrasive blasted surfaces which have flash rusted. Coating may be compatible as an overcoat on existing lead based systems. Coatings are VOC compliant. Conversation with manufacturer representatives revealed these products are relabeled Wasser products. Sherwin Williams did not begin marketing their own moisture cure urethane formulations until a later date.

Site: Highway bridge between Rock Island Arsenal Island and the city of Rock Island, IL.

Discussion:

The contract limited the work to blasting and coating the steel above the 8 piers (numbering system includes the 2 abutments) where the road salts had passed through the expansion joints in the roadway. (Rubber expansion joints had apparently been installed a number of years ago.) The specific work areas extended about 4 feet each direction from the expansion joint but EXCLUDED the area between the beams directly under the joint. (This is the area that would have seen the greatest amount of salt and was indeed very corroded. Blasting and painting would have been difficult because of the narrow space.) The contract called for a white metal blast and an E-303/C-200/C-200 paint system. The contractor delayed work so long that the application requirement of 50° F minimum temperature could no longer be met. The contractor proposed the substitution of the Sherwin-Williams system consisting of 1 coat of primer and 2 coats of the topcoat. Both products are moisture cure urethanes with a minimum application temperature of 20° F. The existing coating consisted of a red lead primer and a black oil based topcoat with a total thickness of about 5-6 mils.

POC: Carol Shaffer, CELRL (309-782-1680) construction rep
Al Beitelman, CECER-FL (217-373-7237)

Application:

Contractor: Brighton Painting
Existing Coating: TT-P-86 Type II in most areas

	Type I in some areas Topcoat probably TT-P-61 or CE-506 Coating thickness was mostly 4-5 mils.
Substrate Condition:	Heavily pitted in area immediately under expansion joint Excellent condition away from the joint area
Blast Equipment:	850 cfm compressor Two ½ inch nozzles GL 40 steel abrasive IPEC abrasive recovery system air handler (bag house) Eagle shower trailer
Surface Preparation :	SSPC-SP5 specified (All existing coating was removed but random areas remained that had dark residues of original mill scale. Flash rust was forming. Total area blasted above pier 7 was approximately 450 sq.ft.)
Weather conditions:	Day temp 44-43° F. Overnight low temp 35° F Light condensation (mist with occasional snow flakes) Light wind Surface remained dry inside containment
Spray Equipment:	Airless Spray 317 Tip
Primer:	Sherwin-Williams Corothane I Zinc Primer This is a 2 component moisture cure urethane zinc-rich paint containing micaceous iron oxide. It has an application temperature range of 20-100F but paint should be >45F. Can be applied at 99% relative humidity but surface must be dry. Recommended thickness is 3-4 mils DFT. Recoat in 4-8 hours. No thinner was required for airless spray.
Topcoat:	Sherwin-Williams Corothane I Coal Tar This is a 1 component moisture cure urethane paint containing coal tar and micaceous iron oxide. It has an application temperature range of 20-100F but paint should be >45F. Can be applied at 99% relative humidity but surface must be dry. Recommended thickness is 5-7 mils DFT. Recoat in >4 hours. No thinner was required for airless spray.

Discussion: I observed the application of the Corothane I zinc primer above pier # 7 (First pier on Rock Island end.) on Sunday, 9 NOV 97. The product consisted of a pigmented vehicle and dry zinc dust. There was very stiff settling in the vehicle buckets. Power stirring and boxing appeared to satisfactorily break up the settled material. The zinc had soft chunks most of which were broken up during the mixing. Very little zinc was retained on the strainer. Application began at 4PM. A light mist was in the air (100% relative humidity). The steel had a very light brownish cast of flash rust. Two painters were in the containment area: one handled the gun; one brushed out runs and moved the ladder. Each had a flashlight for illumination of the area in which he was working. Application was by airless spray. A 317 tip was used. Tailing was minimal. Runs

occurred in complex areas. Brushing them out resulted in a satisfactory appearance. A wet film thickness of 6+ mils appeared to be quite consistent. I left the area at 5:30 PM at which time about half the area had been primed. Primer was being applied to all areas that had been damaged by the blast. This meant that a fair amount of existing oil based paint was topcoated with the moisture cure system. Application appeared satisfactory. When the Corps inspector arrived on-site the following morning the area had received the first topcoat. The second topcoat was applied after 10 AM.