www.pipelines.com

KemaSeries60 Module Sealant — A Pipeline Recoat Project

The Coating Chronicles
January 2002

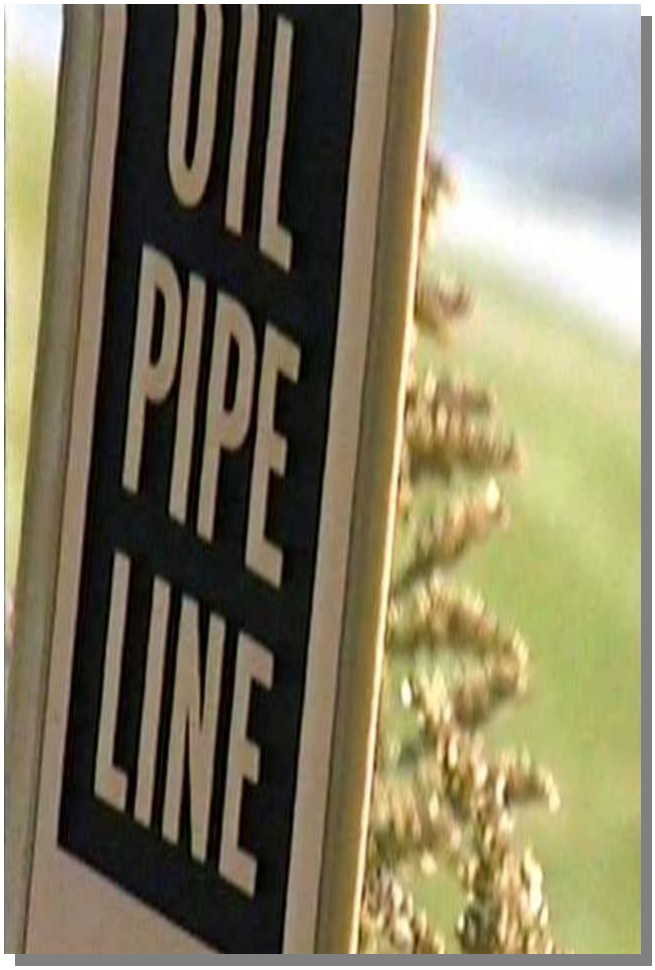
A few years ago our Service Group, Mimar Expert Coatings, Inc. was contracted to complete repairs and a recoat for a continuous 1000 feet length of a 12" OD oil products pipeline that ran under a major eight-lane highway on the island of Montreal in Canada.

Initial Site Inspection

The project location included a 1000 feet long, concrete, storm drain tunnel that had been constructed from cinder block, concrete pipe and poured concrete. It had two entrances—one on either side of an eight lane highway. The main entrance was always open and measured six feet wide by nine feet high whereas the secondary entrance was of a grated, manhole design that was flush with grade.

The 12" OD steel pipe had been installed some fifteen years prior to our site inspection. It entered the main entrance of the tunnel through a buried, 16" OD steel casing pipe.

The oil products pipeline left the grade of the casing pipe and proceeded into the tunnel, around a small bend, then through it as an elevated pipe which had been secured to the tunnel wall with steel brackets. These brackets were spaced about every twenty feet. Each bracket had a rubber pipe support



Atop storm drain at road level looking out and across access road to highway.

Looking down at water-filled tunnel entrance.

Water run-off from tunnel feeds creek that needed protecting.

KemaSeries60 Module Sealant

attached to it.

Clearance distance between the wall and the back side of the elevated pipe was approximately five inches and the height of the pipe from the floor of the tunnel was about eight feet.

There appeared to be a constant volume of water within the tunnel at all times. Water depth was 12" at the time of inspection.

The concrete walls and ceiling were dry above the water line, however, watermarks along the walls chronicled much higher water levels.

Preliminary Pipe & Coating Assessment

The closer to each entrance one was the more serious the pitting and corrosion cells. As one proceeded further into the tunnel the protective coating appeared to be more intact however very weak interfacial adhesion was also observed.

The original pipe coating appeared to be in tape form and of a rubber adhesive/polyethylene film composition. It had a total thickness that was slightly greater than black electrical tape. There was only a marginal amount of adhesive remaining across the whole length of pipe and in some areas there was no sign of a liquid primer application being completed prior to the tape wrap installation.

The steel pipe wall bracket assemblies

The destructive result of coating loss, environmental exposure and time.

Poor surface preparation and continuing moisture produced these corrosion cells.

Precise pit depth readings were taken to help assess extent of damage.

A Pipeline Recoat Project

including the wall mount screws and the attached rubber roller kits had been installed uncoated. Many brackets were in an extreme state of metal loss and advance corrosion. The rubber rollers had long since become dry, cracked and many had split under the weight of the pipe.

A Plan Of Attack

Following inspection and assessment it was decided that the repair program would have three parts.

1. Quantify the extent of metal loss of pipe and bracket assemblies. Replace metal components found to be outside of Code;

2. Clean and recoat all piping and bracket assemblies; and,

3. Isolate all piping and bracket assemblies from contact with adjacent metal and concrete.

Coating Selection

KemaSeries60 Module Sealant, a 65 mils. thick coating, was chosen to protect the exterior of both the casing pipe and the product pipeline. It was applied with a 50% overlap over a cured, specified, liquid primer following a Power Wire Brush cleaning. Total thickness was 130 mils.

A Kema liquid epoxy was used to coat the steel pipe brackets after each was sandblasted to NACE 2. The Kema epoxy was also injected into the bracket bolt holes and each bolt was first dipped in the epoxy before it was installed. Epoxy dry film thickness was 20 mils. minimum.

Safety practices included escape ladders harnesses and supplemental air supply.

Underground—where pipe cleaning with aluminum oxide paper is the norm.

Power wire brush cleaning in preparation for liquid primer application.

The Coating Chronicles
January 2002

Published by kema coatings limited

Kema 250 Module Sealant, a 125 mils. thick polymer compound, was used as a gasket material to isolate the pipe wall brackets from the concrete wall surface.

Replacement rollers were of urethane.

A Basis For Coating Selection

We realized early on that the recoated pipe would not be exposed to any undue mechanical forces as found with buried service. The one exception was the exposed casing pipe to product pipe transition that was eventually over wrapped with a perforated rock jacket material. The KemaSeries60 was strong enough to withstand any temporary impact with floating flotsam at times of high water.

We knew that KemaSeries60 chemistry would resist attack from such environmental agents as organic liquids and vapor, moisture, ozone, sunlight and biodegradation. And, we knew that it would perform better than amorphous, heterochain and photosensitive polymers as well as polymers with Short-chain N. KemaSeries 60 also outperforms unsaturated elastomers such as polyisoprene and polybutadiene in the same application.

Conclusion

It is now four years later and the pipeline owner remains satisfied with the work performed. Each year the site is inspected. Each year the coatings appear as good as new.

Casing end was first sealed then both pipes were wrapped with KemaSeries60.

6” wide KemaSeries60 was used with a 50% overlap.

The final view from within. The recoated pipe in place and awaiting deliveries.