A few years ago our Service Group, Mi- 
mari Expert Coatings, Inc. was contracted to 
complete repairs and a recoat for a contin-
uous 1000 feet length of a 12” OD oil products 
pipeline that ran under a major eight-lane 
highway on the island of Montreal in Can-
da.

**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 en-
trances—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 inspec-
tion. It entered the main entrance of the tun-
nel through a buried, 16” OD steel casing 
pipe.

The oil products pipeline left the grade of 
the casing pipe and proceeded into the tun-
nel, 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
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
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.
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.