

Project Profile

Project:

Region of York Culvert Rehabilitation, King St., Newmarket, ON

Customer Issue:

Fully deteriorated 2500 mm x 2100 mm ellipse CSP culvert located underneath a 4-lane road and bridge located on King St in Newmarket, ON.

Customer Request:

Full structural relining of the fully deteriorated ellipse CSP culvert on King Street, 1.33 KM East of Keele St., utilizing Nukote's fully structural SAPL (spray applied lining) system.

Products Utilized:

Nukote PP300

Nukote ST M

Application Method:

Nukote 360 Ringtech RCOSH System

Client:

Region of York

Material Distributor:

IMC Distributors Inc.

Applicator:

Aqua Tech Solutions

Engineered By:

Nukote Coating Systems

Application Area:

2200mm x 2100mm Ellipse CSP
Culvert

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Project Description:

The purpose of this project was to rehabilitate a fully deteriorated ellipse CSP culvert. Being located under 4 lanes of traffic and a bridge, rehabilitation of the culvert, as opposed to replacement, was the most cost-effective option with the least amount of disruption to traffic flow.

The culvert buried depth was approx. 3.5m under the roadway so traffic loads were taken into consideration. For the project design it was assumed that the existing deteriorated corrugated steel pipe would not contribute to carrying loads and all dead and live loads would be applied directly to the PP 300 structural liner.

The Nukote PP300 was recommended as it has significantly high tensile strength and has been tested in laboratory to increase the capacity of elliptical, oval, and circular pipes. Nukote ST M was to be applied over the PP300 for additional corrosion and impact resistance. Total thickness of the PP300 applied was 1" (25mm) with 2mm of Nukote ST-M.

The Region had concerns that flow might be impacted due to liner thickness and calculations were performed to demonstrate that the liner would lead to a 5% increase in flow, as opposed to a decrease, as a result of its smooth surface.

As the culvert had creek beds located at both culvert exits Fisheries and Oceans Canada had concerns around which products would be utilized in the rehabilitation. They reviewed the recommended products and provided approval. The Nukote SAPL system is ANSI NSF 61 certified, has no solvents, VOCs or styrenes.

Prior to the coating application the interior of the culvert was cleaned and all areas where screws were present were striped for added reinforcement. The Nukote PP300 and Nukote ST M were applied utilizing Nukote's 360 Ringtech RCOSH System.

Products Utilized:

Nukote PP300 is a specialized, high performance polyurea coating designed and developed to protect buried and exposed structures. It can be applied in a variety of industrial facilities including power, manufacturing and mineral processing industries in addition to AWWA Type III and IV SAPL applications. This aromatic Polyurea Elastomer displays good resistance to a broad range of chemicals including hydrogen sulfide, methane, excellent thermal stability, abrasion resistance and UV resistance. Nukote PP300 exhibits excellent adhesion to most substrates with or without use of a suitable Nukote primer.

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Nukote ST M is a multipurpose, specially formulated, two-component, 100% solids, pure Polyurea that significantly reduces downtime in new as well as old construction and is suitable for metal, non-metal, SPU, and concrete structures and assets. This aromatic Polyurea Elastomer displays good resistance to a broad range of chemicals including hydrogen sulphide and methane. It has excellent thermal stability, abrasion resistance, and UV resistance. Nukote ST M is ideal for industrial applications in severe and demanding applications that require very high abrasion resistance, combined with hydrolytic stability, high impact as well as tear resistance.

Before Rehabilitation:



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Striping:



Robotic Application:



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Culvert Complete:

