Closed Circuit Television Sewer Line Inspection Camera Transporter

Project Name: The Pipe Crawler

Client:
Mr. John Smith, Superintendent
Lexington Department of Public Works
890 Shop Road
Lexington, VA 24450

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Prepared By:

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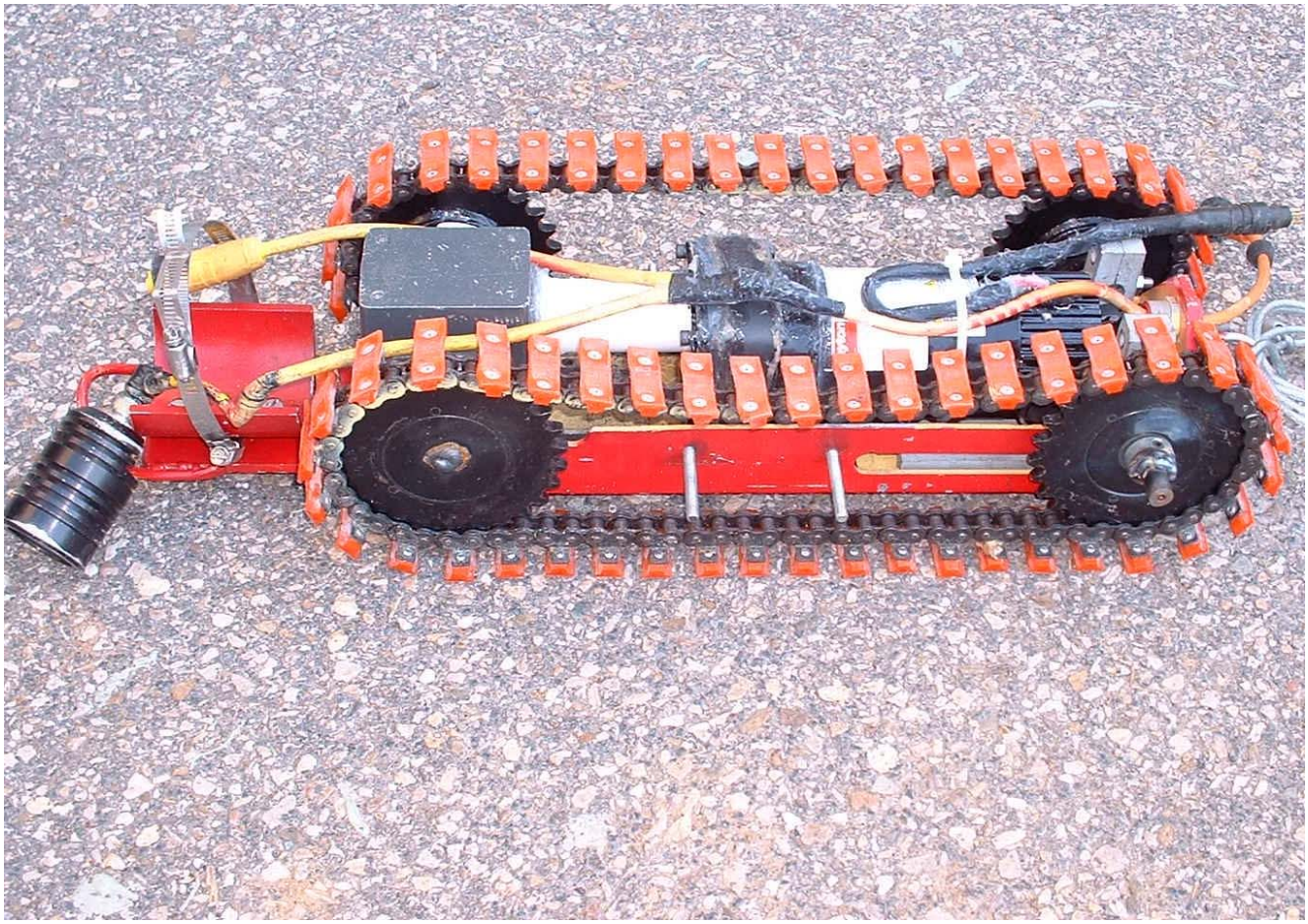
Project Background – 2.0

Mr. John W. Smith, Superintendent of the Lexington Department of Public Works, the design team composed of Cadets Eric Waters (Team Leader), Peter Bennett (Team Engineer), and Chi-Wen Ke (Team Engineer) to redesign the closed circuit television sewer line inspection camera transporter, also known as the Pipe Crawler. Design criteria specified that the Pipe Crawler would be no longer than 24 inches, be able to operate while submerged, travel inside a minimum 8-in diameter sewer pipe, and travel a distance of 500 ft.

The system that was used by the Lexington Department of Public Works, before the Pipe Crawler project, was a "hard wire" system that was pushed through the sewer pipe. Due to the flexibility of this system the camera could only be pushed a maximum distance of 190 ft. Other systems were used such as using a water jet to push the camera through the pipe. This proved to be very difficult to operate because of the velocity that this system operates at. Various commercial transporters were rented for use in the past, but they encountered dilemmas because they were not designed for use in the winding terracotta pipes.

Problem Statement –3.0

Mr. John W. Smith tasked the team with redesigning or constructing a new closed circuit television sewer line inspection camera transporter that improved the capabilities of the 2002 design. The Pipe Crawler must be able to pull the supplied "soft wire" a distance of 500 feet. The cable weighs 110 pounds per 1000 feet. The Pipe Crawler must also be waterproof, which is a criterion that was added because the

2002 design failed when it was submerged. The Pipe Crawler also had to run in a pipe ranging from a 6-inch diameter to a 36-inch diameter. Mr. Smith instructed the team that the old gear motor, if still operable, was acceptable for use, or a new gear motor could be found. The 2002 Sewer Tank was also supplied for modifications.