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MECHANIZED PIPE REHABILITATION DESIGN AND CASE STUDY

ABSTRACT
Larger diameter sanitary sewer conveyance pipelines may be re-lined with Glassfibre Reinforced Polyester (GRP) Fiberglass pipes using specialty made sliplining jacking machines. While winches or hydraulic jacks have been used to pull or pushed the new GRP into existing brick lined or reinforced concrete sewers, these are less effective in larger diameter greater than 1600 mm (66 inches) in diameter.
In the United States, the contractors use large sliplining machines with twin hydraulic motors and synchronized caterpillar chain drive to traverse the pushing arm at the flow level in both directions in a very rapid manner. This method allows for sewer to be in full service and causes no interruption to service in live flow and without a need for flow bypass systems. The cost savings of long-distance pushing (jacking) capacity, live flow without bypass and controlled jacking loads and speed are a few of the benefits of these new highly mechanized systems. The longest drives to date, utilizing centrifugally cast GRP pipes are as follows;
1700 meters (5,200 LF) 1250 mm (51 inch)
1370 meters (4,500 LF) 1400 mm (57 inch)
761 meters (2,500 LF) 2500 mm (96 inch)
This paper will discuss the design and construction of such sliplining machines and field assembly and operations of the method that was utilized in Oakland, California; 3rd Street Sewer Rehabilitation project. Challenges and success of the project will be discussed, and future upgrades to the system will be considered. Use of modern automated pipe relining equipment and high strength GRP jacking pipes results in an overall cost effective solution to CIPP, SPR and other lining methods currently being marketed.