

**STEP, STEG AND VARIABLE GRADE SEWERS, CRANSTON, R.I.**

**Client:** City of Cranston, R.I.

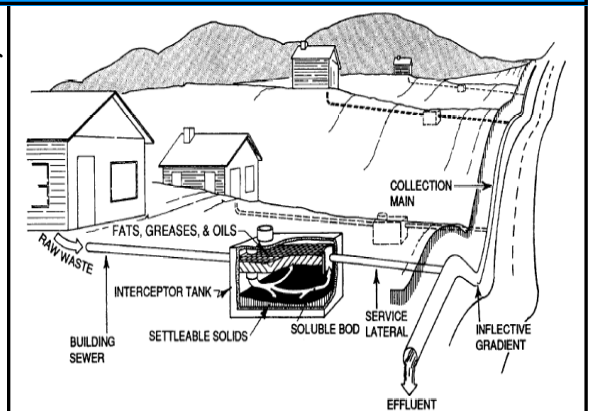
**Project Manager:**

**Daniel J. Coughlin, P.E.**

Mr. Coughlin was Project Manager for the development, evaluation and design of several innovative wastewater collection systems within the City of Cranston, to service fringe areas of that community. Mr. Coughlin's developed analysis techniques to simulate the filling, flushing and draining of innovative variable grade sewer methods which allow a partially clarified wastewater to traverse miles of undulating terrain while simultaneously creating periodic scouring velocities within the system to better maintain the pipeline. These innovative wastewater collection/conveyance system methods better known as Variable Grade Sewers (VGS) were also structured into hybrid alternative methods now commonly referred to as STEP (Septic Tank Effluent Pumping) and STEG (Septic Tank Effluent by Gravity) systems.

The largest VGS was a 3 mile, 14 inch variable grade sewer serving Western Cranston, with a 3.9 MGD municipal Pump Station serving as the pipeline feed. A second system included a 1.5 mile, 4 inch variable grade sewer with STEG feed system serving a new elementary school with dual 16,000 Gal. septic tanks. These Innovative/Alternative method significantly reduced the impacts and costs to the community.

The total value of facilities was over \$3,000,000.



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