

# **Development of a Performance Index for Stormwater Pipeline Infrastructure**

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Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

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In  
Civil Engineering

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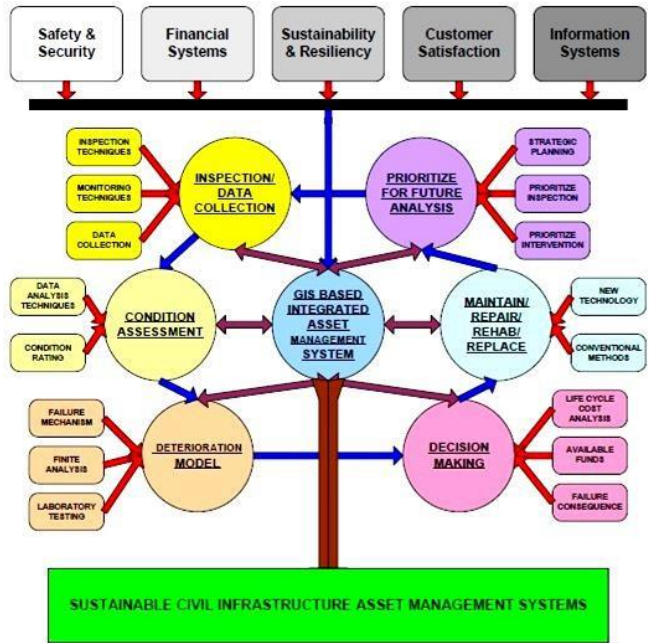


Figure 2: Framework for sustainable municipal asset management program (Gay, L. F. and Sinha, S. K. (2014). Water Infrastructure Asset Management Primer, Report No. INFR9SG09b, Water Environment Research Foundation, Alexandria, VA, 2-14. Used under fair use 2015.)

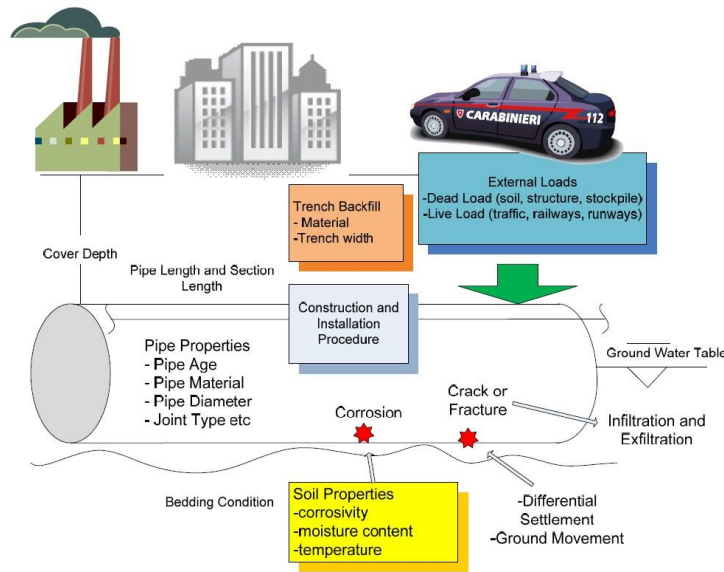


Figure 6: Factors affecting the performance of a buried pipe (Sinha, S., Angkasuwansiri, T., and Thomasson, R. (2008). "Phase 1: Development of standard data structure to support wastewater pipe condition and performance prediction." *Development of protocols and methods for predicting the remaining economic life of wastewater pipe infrastructure assets*. Report No. 06-SAM-1 CO, Water Environment Research Foundation, Alexandria, VA. Used under fair use 2015.)

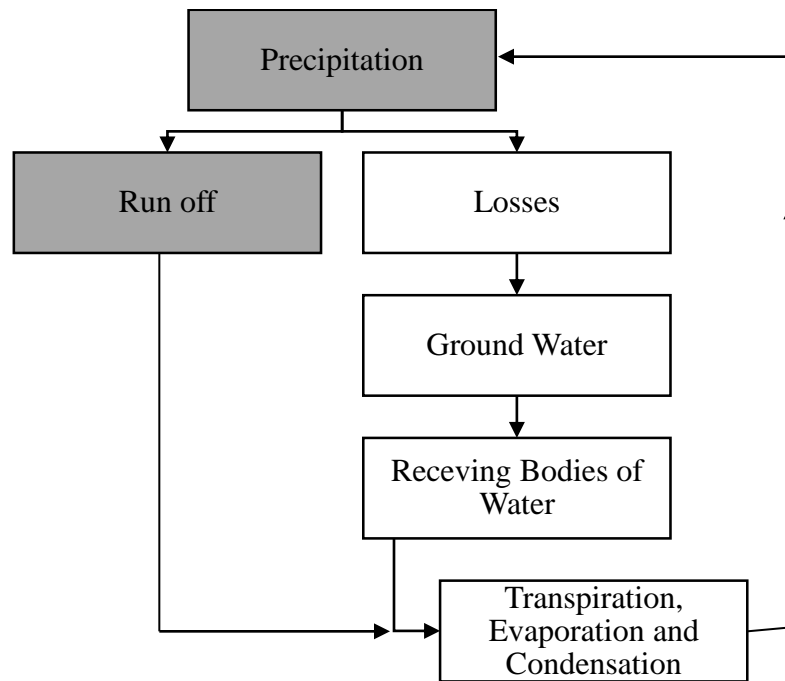


Figure 7: The hydrologic cycle. Precipitation and runoff need to be estimated to design stormwater pipe. (Adapted from National Corrugated Steel Pipe Association. (2008). *Corrugated Steel Pipe Design Manual*. Dallas, TX.)

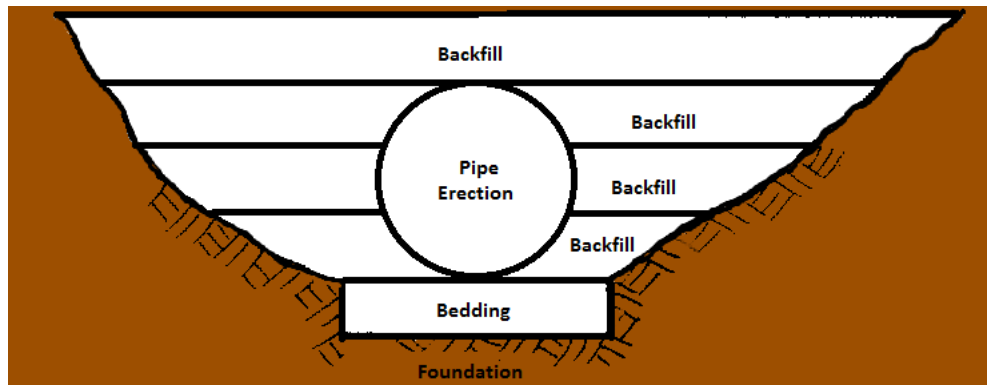


Figure 8: The sequence of construction of an underground pipe includes foundation preparation, bedding preparation, pipe erection, and backfilling in layers (Adapted from National Corrugated Steel Pipe Association. (2008). *Corrugated Steel Pipe Design Manual*. Dallas, TX.)

Table 2: NASSCO's PACP Grades (Sinha, S., and Angkasuwansiri, T. (2010). "Phase 2: Development of a robust wastewater pipe performance index." *Development of protocols and methods for predicting the remaining economic life of wastewater pipe infrastructure assets.* Report No. 06-SAM-1 CO, Water Environment Research Foundation, Alexandria, VA. Used under fair use 2015.)

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Table 12: Parameter Confidence Scale (Sinha, S., and Angkasuwansiri, T. (2010). "Phase 2: Development of a robust wastewater pipe performance index." *Development of protocols and methods for predicting the remaining economic life of wastewater pipe infrastructure assets.* Report No. 06-SAM-1 CO, Water Environment Research Foundation, Alexandria, VA. Used under fair use 2015.)

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