Case Study

DETECTING INFLOW AND INFILTRATION WITHIN A WASTEWATER SEWER NETWORK

INTRODUCTION

Detectronic were commissioned by a UK Water company to help investigate infiltration and inflow (I&I), entering the waste water sewer network.

The catchment under investigation suffers from tidal influence. Of particular importance to the client and a key focus of the project was to uncover the impact of saline I&I into the waste water sewer.

Detectronic was tasked with identifying, with a certain level of confidence, where water from the tidal river was entering the sewer.

OBJECTIVE

Detect Saline Inundation within the wastewater sewer network.

PLANNING & IMPLEMENTATION

Owing to the fast rate of rise from the expected tidal influence within the sewer network, it was not possible to use conventional monitoring technology. The fast rate of rise and high tide, limits the use of non-contact ultrasonic level sensors, and compression sealed manholes prevent the use of vented pressure sensors.

The chosen technology used to gather seamless level data throughout the sealed part of the waste water network under both normal and surcharged conditions, was the LIDoTT®.

The LIDoTT® has patent pending technology which integrates level, depth and temperature sensors into one compact device. As such it is proficient in delivering reliable data during normal and surcharged conditions.

For conventional surface water runoff I&I reporting a raingauge was used.

The horizontal or detailed point of entry is then calculated by evaluating the varying crest height of the transient pressure between the four monitoring nodes, and the time of transition between the crest traveling

Tide ebb at 4.2m chart Datum
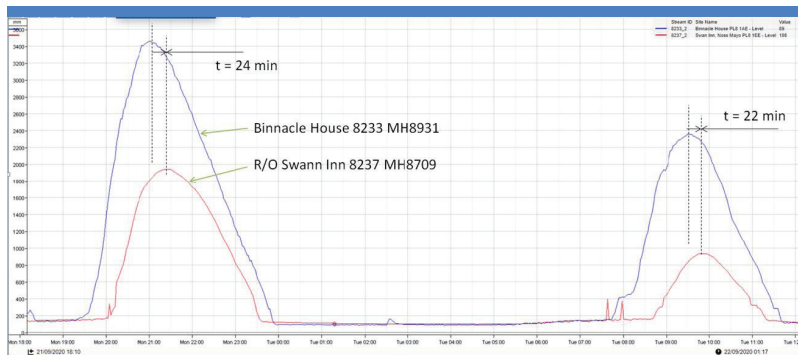
along the sewer network.

The above data shows the crest height and time taken for it to be present at MH8709. Time of travel = 9.402m/min

Using this information together with the known height above chart Datum (750mm), it is possible to estimate where the entry point of the river is.

The LIDoTT® provides seamless data transition between normal condition and surcharge, thus allowing the transient crest H_2O m to be mapped through the network.

RESULTS

Using transient pressure recording from the LIDoTT® (H_2O mm), scaling the spring & neep tides, and a simple timing against distance algorithm, it has been possible to pinpoint with a high degree of confidence where the river is entering the sewer network.

As a result of the steep catchment, I&I from rainfall precipitation is present throughout the entire wastewater network. Although there has only been a few significant rainfall events, it can be concluded rainfall has a major impact on the available capacity within the waste water network when coupled with a spring tide.

Products and Services
- LIDoTT® Level Sensor
- Raingauge
- MSFM Flow Meters
- MSFM Lite
- Data screening
- Weekly reports

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