Application Guide
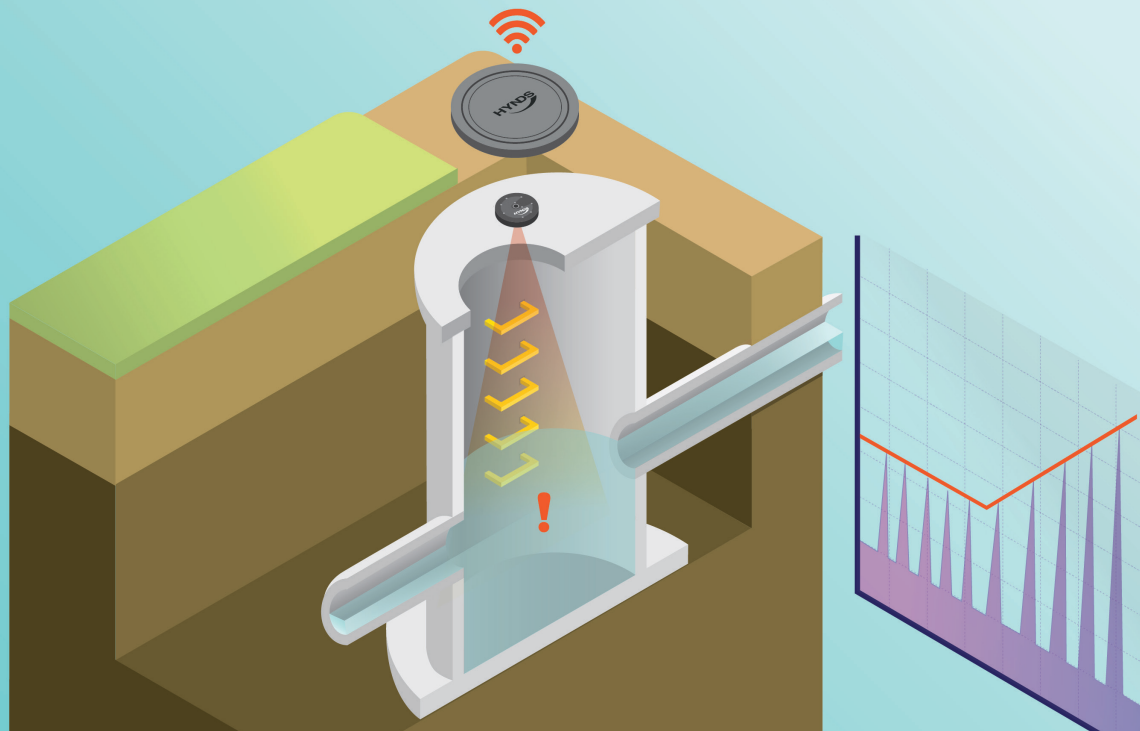
Smarterwater®
Manhole Sensor

Trend Change

Sensor

The Smarter Manhole sensor is a product 100% developed in New Zealand by Hynds Smarterwater to respond to the need for measurement of water in gravity infrastructure so that the various water resources can be managed. Measure to Manage, Measure to Act.

The Smarter manhole Sensor is the first of its kind, being an in-manhole IoT level measurement sensor that does not diminish the effectiveness of the access point. We developed the sensor to discretely fit into the manhole cover itself, automatically measure level and tamper events, and transmit them to the asset owner.

Application

In most gravity systems the manhole acts as a detention device and provides added capacity to the network. The level behaviour in the manhole is an indication of the amount of hydraulic load the device it is experiencing. When the flows are minimal, they enter and exit the manhole within the benching, however when the load is larger, the manhole capacity above the bench is used.

As we typically have very little instrumentation in our gravity systems, we cannot determine what "normal" looks like for any specific location or area of the network. Changes in the trend load on each manhole that can result from urban intensification, progressive blockage, infiltration from damage pipes and many other causes, goes undetected.

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measure to manage, measure to act

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Application (continued)

The manhole can then progress from loaded, to stressed, and eventually failure, with the only indication being the final event of breach and flood at the surface.

This poses a risk to public health through contamination and potentially exposed manhole entries, as well as environment and property damage. It also means the work teams need to work in more hazardous environments or are unable to resolve the problem until after it subsides, leaving communities in distress.

Knowing that there is significant change in a manhole's performance through change in trend behaviour, allows the work teams to focus on resolving the causes such as a progressive blockage, illegal connections, or unexpected flows before they become a failure event.

By utilising the smarter manhole sensor in various locations such as lower stormwater catchments and wastewater systems, the sensor can tell the work teams where to look, and when to look. Measure to Manage, Measure to Act.

Solution

The manhole itself has an easily calculated capacity. With the Smarter Manhole sensor is applied, the change in trend behaviour of that manhole can be measured. This process can be applied to a single manhole or many.

For gravity systems, normal rain events tend to place the maximum load on the capacity of the lower catchment or the lowest hydraulic point, so the Smarter Manhole sensor will allow the asset owner to learn what the normal behaviour of any location is and map the trend.

Without needing to add any additional information such as rainfall or analytics, the trend change alarm will alert the team to the fact that this location is now seeing a significant change in behaviour that requires attention from the maintenance team.

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