Application Guide

Smarterwater® Manhole Sensor

Scan for more information

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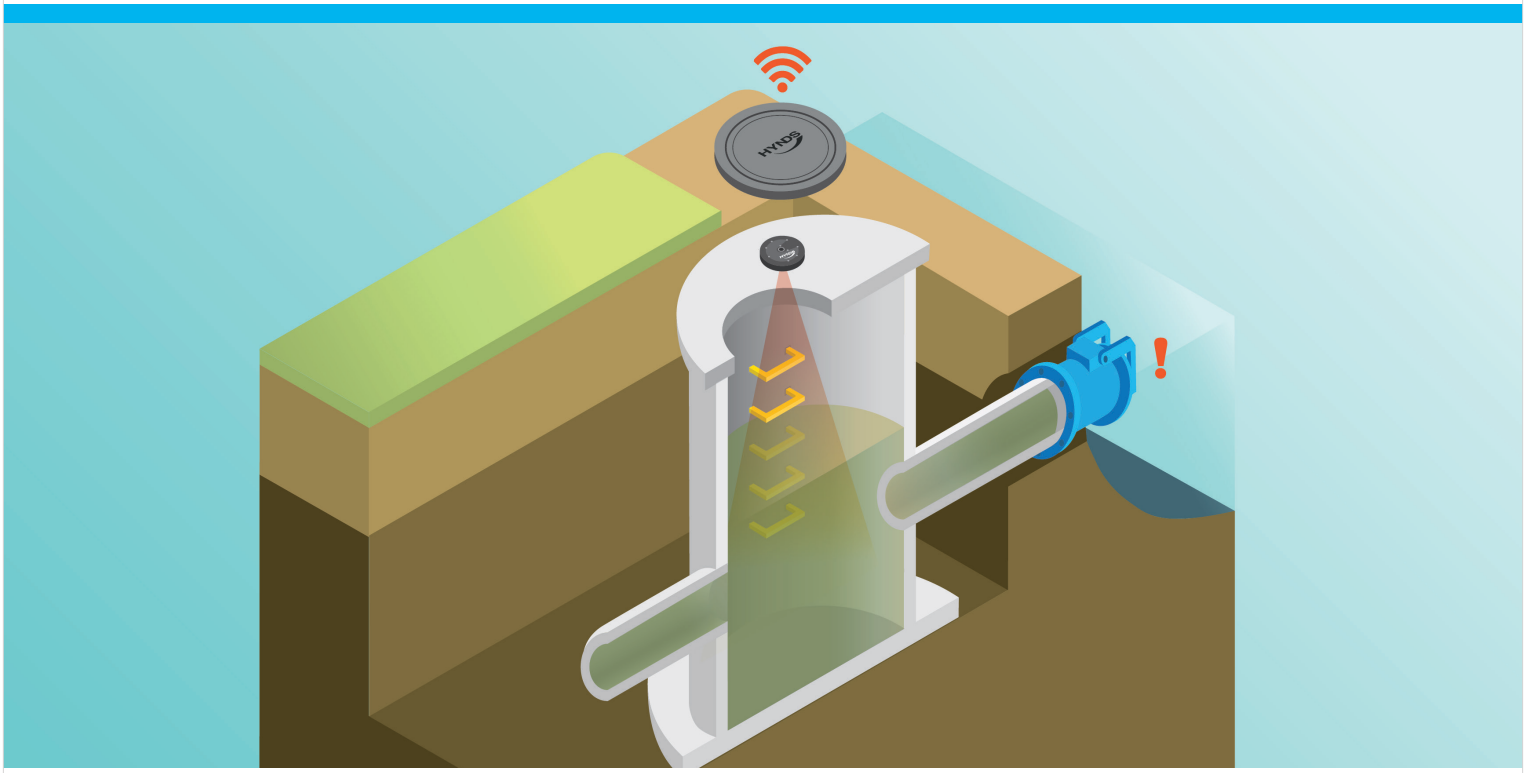

Check Valve Failure

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. A very large number of these systems flow into the ocean along our estimate 15,000 to 18,000 km's of coastline.

One of the key issues around gravity network capacity is infiltration. While damaged pipe systems allow additional ground water influent, and cross connection and illegal connections are also of concern, one of the largest

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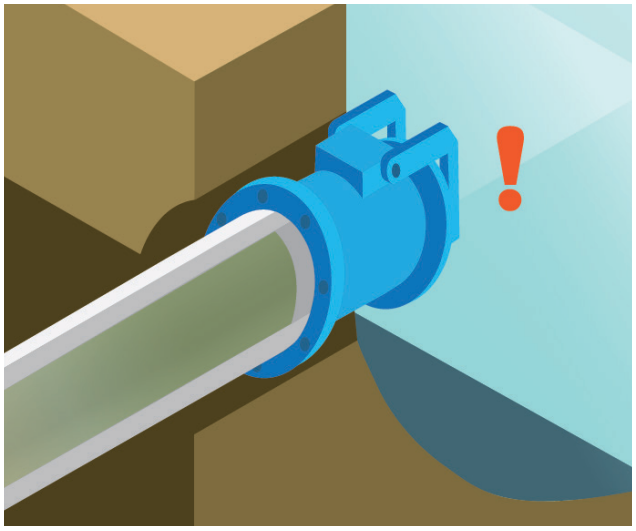
Application (continued)

influences on our network capacity can be tidal infiltration. With climate change providing less stable weather patterns and prediction of more frequent storms, failure of ocean outfall check valves can be a serious concern. Many end of line check valves do not seal, and like all mechanical devices, failures can occur.

With king tides, low pressure systems causing storm surges and other related weather events, we need the capacity of our stormwater systems to protect communities from flooding and networks from corrosive saltwater damage.

Flooding poses a risk to public health through contamination and potentially exposed manhole entries, as well as environment, property, and asset 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 check valve performance through change in manhole behaviour, allows the work teams to focus on repairing the damage before it becomes a failure event.

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

Measure to Manage, Measure to Act.

Solution

The levels in a manhole have a natural set of behaviours for that application. When the Smarter Manhole sensor is applied, the change in the functional behaviour of the check valve against the tide has a very specific appearance in the data.

Coupling the normal rain events to check valve performance in the lower catchment or the lowest hydraulic point, the Smarter Manhole sensor will allow the asset owners to learn what the natural behaviour of any location is, review and manage check valves and ocean outfalls, and optimise the capacity of existing systems.

Without needing to add any additional information such as rainfall or analytics, the check valve failure monitoring 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. System wear or failure can be repaired before it becomes an undesirable or damaging event.