Tellus Utilities

Innovation Engineered

HYDRAPULSE

www.tellusutilities.com

www.aussietrenchless.com

AUSSIE
TRENCHLESS
SUPPLIES

About Tellus Utilities

- Spin off from an engineering design and development company, Reece Innovation
- Tasked with introducing new innovative technologies developed with the utility sector, for the utility sector
- Partnering with Aussie Trenchless Supplies to bring technology to new geographic markets
- Development of new products with technology development partners
- Leverage cross-sector experience to deliver innovative solutions;
  - Oil & Gas, Utilities, Offshore Engineering, Electric Vehicles, Healthcare, Biotechnology, Chemicals & Pharmaceuticals, etc.

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Addressing the Market Need

- Sewers subject to low flow, silting issues or Gas build up can require expensive routine maintenance
  - Cleaning a main sewer is expensive & inconvenient
  - The regular need to clean a low flow, low gradient sewer causes customer issues, de-silting requirements & is an ongoing problem with in-house maintenance staff
- A low maintenance passive device such as a HYDRAPULSE™ Flusher Gate can be installed in-situ to ensure sewer cleanliness by the regular release of slugs of effluent to create a down - and up - stream flushing effect when strategically positioned
- Flood defence strategies can also utilise the HYDRAPULSE™ Flusher Gates to hold & distribute effluent throughout the network to avoid surcharging
- Positioned correctly, the key attributes of a successful installation is:
  - Reliability
  - longevity
  - anti-blocking
  - ease of maintenance

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Overview of the Technology

- Primarily based on well established ‘tipping’ design
- With the gate in the closed position, effluent level builds until a sufficient head pressure of fluid opens the gate, creating a down - and up - stream flushing effect on stagnate solids.
- The HYDRAPULSE™ Flusher Gate is ideal for existing sewer systems with ongoing silt build ups that require regular cleaning
- The gate seal is designed in such a way to maximise reliability and ease of maintenance

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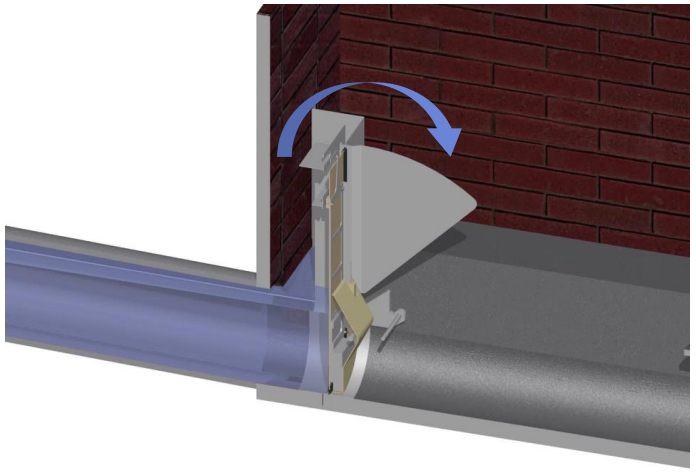
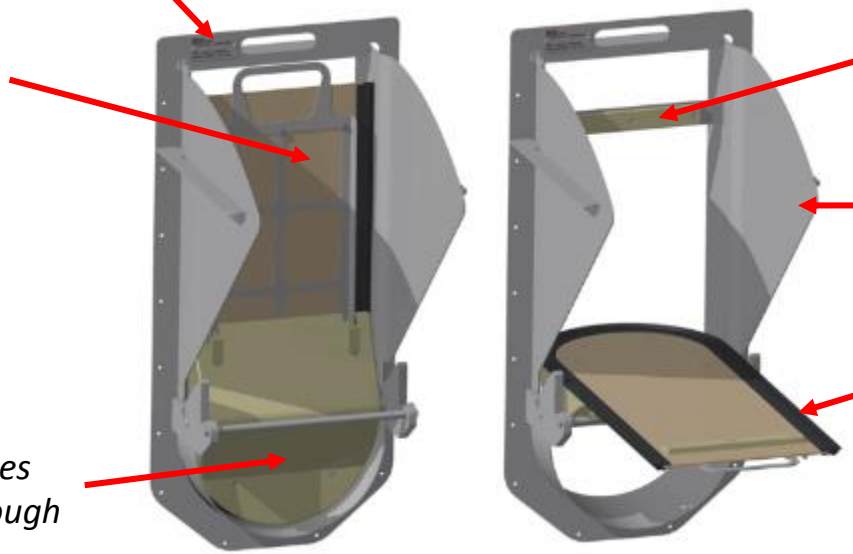
Design Features



Framework offers overflow route during storm conditions, so in inherently "fail safe".

Advanced material selection suitable for harsh environmental conditions



Features to ensure 'digital snap' effect between open and closed states

Instantaneous gate opening ensures high energy flush wave.

Advanced gate seal technology to ensure high reliability and ease of maintenance.

Anti-snag design features ensuring clear flow through the gate.

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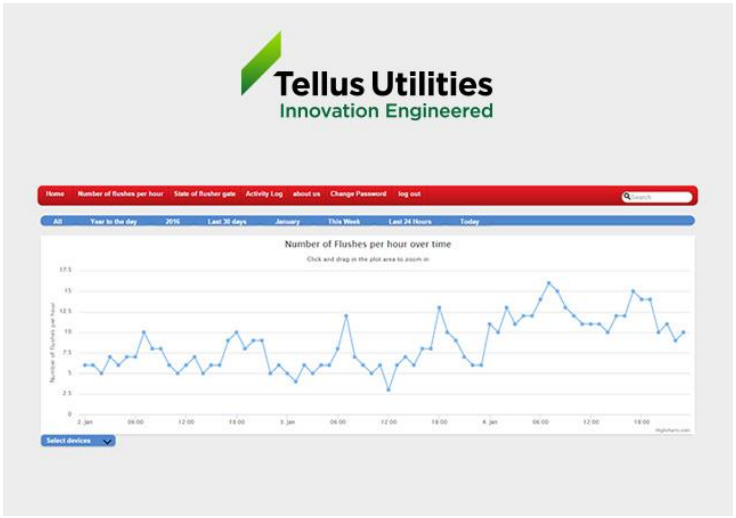
Data Logger & Telemetry Module

- Sensor used to record gate activations
- Time stamp information supports evaluation of gate utilisation
  - Flow rate can be inferred
  - Supports continuous and remote monitoring of the gate
- Relays data remotely via GSM or radio network
- Uploads data onto Tellus Utilities server



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Videos

Test Sewer Video… (https://www.youtube.com/watch?v=hKQq5i3XCuc)

Live Installation Video… (https://www.youtube.com/watch?v=223ITr792Vo)

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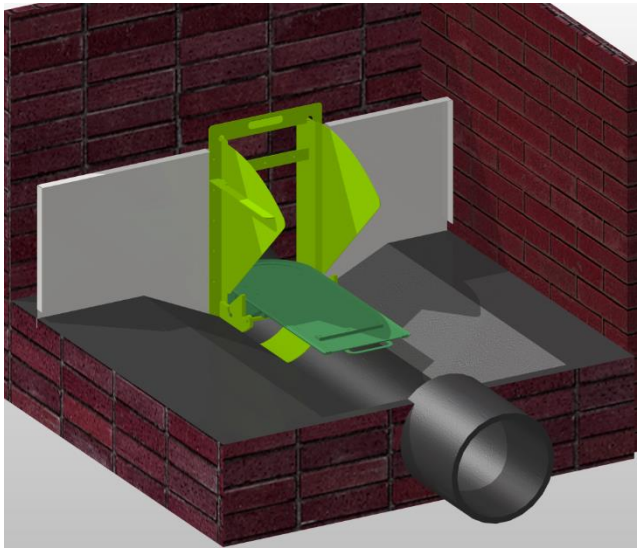
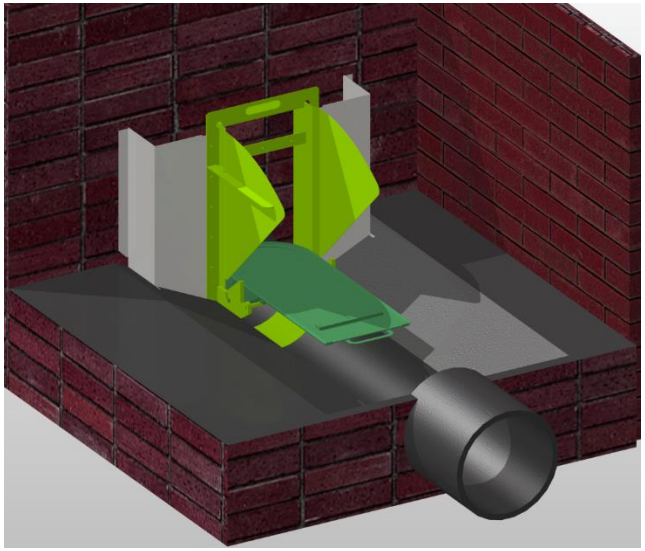
Installation

- Various sewer sizes can be accommodated
  - Our standard sizes are 200mm and 300mm
  - Accessories available to extend up to 450mm
  - Bespoke systems can be developed for larger sewers
- Different side panel and framework options to accommodate different manhole geometries, whilst retaining overflow (fail-safe) route for effluent
- Installation can be performed by water companies or their preferred contractor
  - Full training & support is available





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Operational Effectiveness

- Device is designed to;
  - Maintain cleanliness in sewer systems after jetting, and to dramatically reduce the need to re-jet
  - Reduce the likelihood of blockages, including Fat Oil and Grease build up.
  - Operate with minimal maintenance requirements
  - Accommodate storm conditions through ‘fail safe’ design
- Research shows that for a 2000mm diameter pipe with a 1600mm dam height, a useful flushing distance of 1500m can be achieved [*]
- The maximum flushing distance is affected by the gradient of the sewer, the dam height at the point of release and the storage length of the sewage.
- The HYDRAPULSE^{TM} design maximises the conversion of stored potential energy into kinetic energy during the flush in order to improve cleansing effect.

[*] - Numerical Investigations on the Function of Flush Waves in a Reservoir Sewer - Dipl.-Ing. JÅNorg Schaffner aus RÅNusselsheim (2008)

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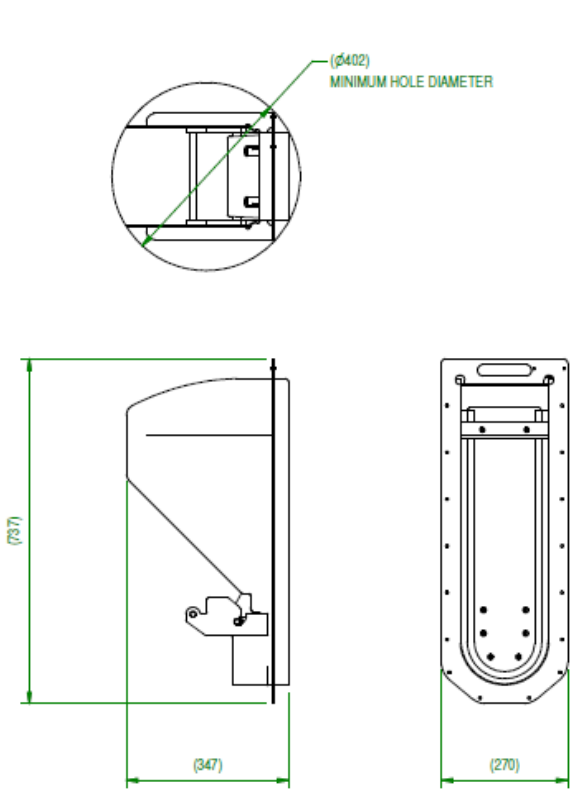
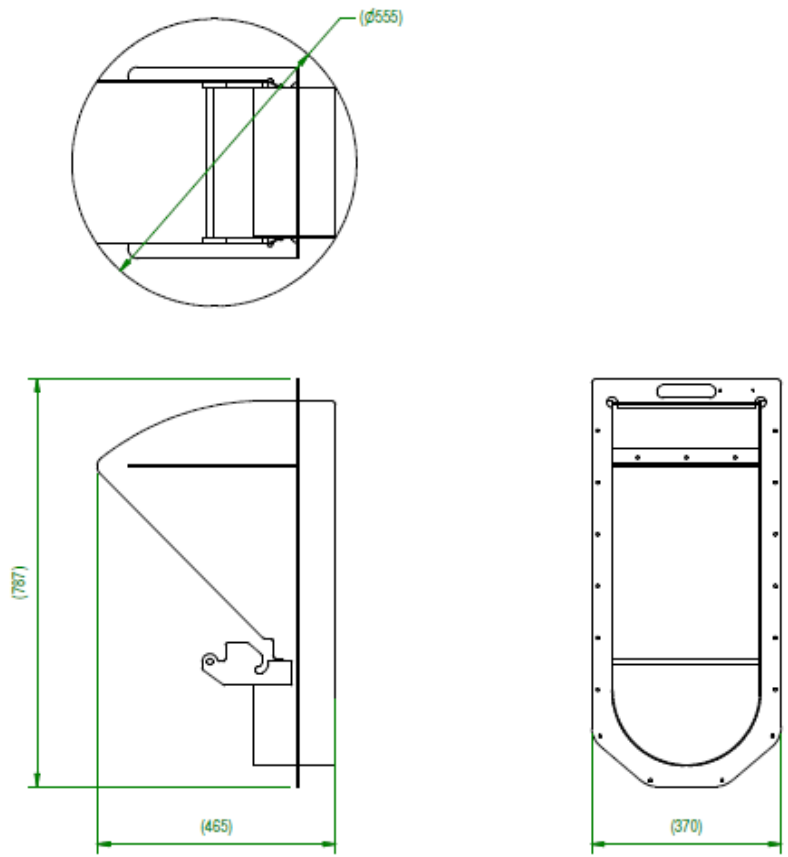
Size Envelopes – 200 & 300 Continuous Seal Gate



*200 Gate size envelope with minimum manhole diameter of **450 mm***



*300 Gate size envelope with minimum manhole diameter of **570 mm***

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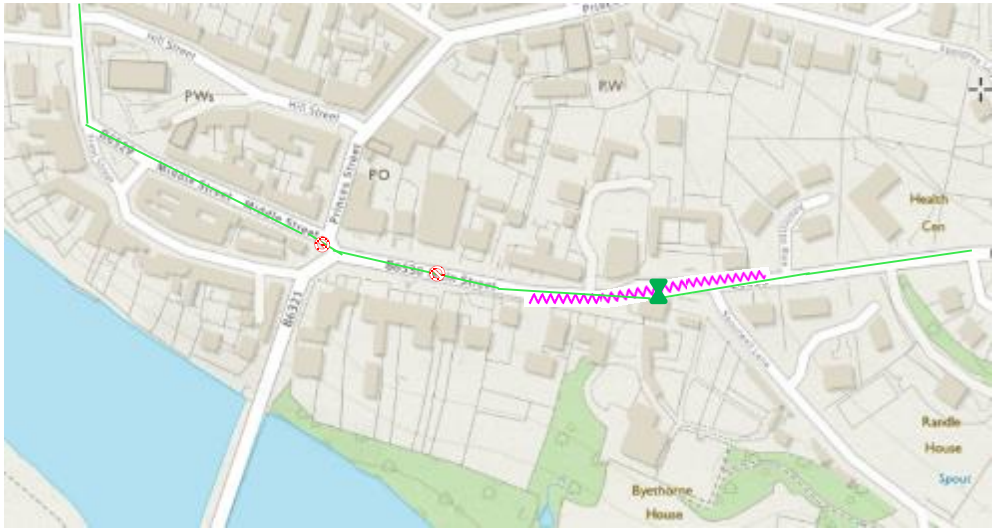
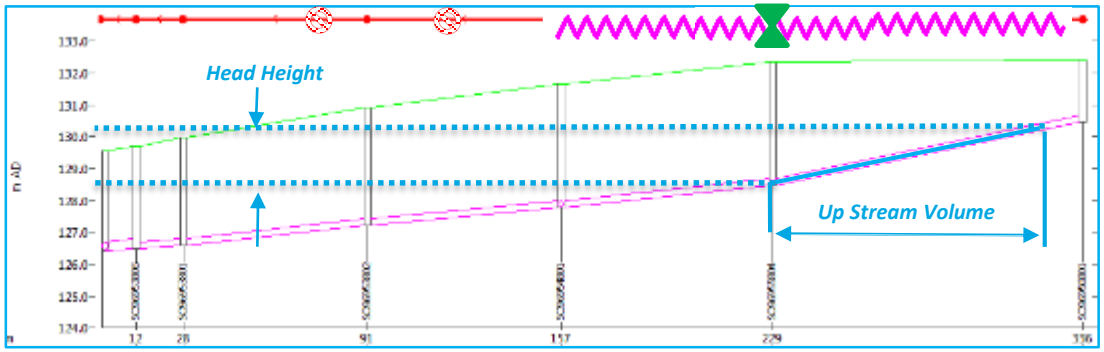
Site Selection Example



- HYDRAPULSE™ location chosen to have maximum effect in order to;
  i. Reduce frequency of planned cleansing operations
  ii. Prevent blockages from occurring immediately downstream.



Flusher Gate

Reported Blockages

Planned Cleansing

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Product Adoption

- Accelerated testing undertaken in high effluent volume test facility
  - Installed for >3 months
  - 20000+ flushing cycles with zero maintenance requirement
  - During RAG testing the gates anti snag features performed as expected. On subsequent flushes rags were flushed downstream of the gate.

- Product now being installed in UK networks
  - 8 cycles per day on average
  - Data thus suggests the potential for ~10 years plus maintenance free operation
  - Gates can be replaced without removing the frame therefore long working life

- Ongoing product development in relation to different sized sewers and installation requirements

- Talk to us about your interests and requirements (standard or bespoke)
  - We would be pleased to discuss a product trial

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