

TAI WAI & TAI PO, Hong Kong

Client: Government of Hong Kong

Country: Hong Kong

No. of Vacuum stations: 2

No. of Valves: 110

Volume of Flow: 40 litres/second

Specialist Feature: Vacuum sewers installed in narrow streets that restricted access.

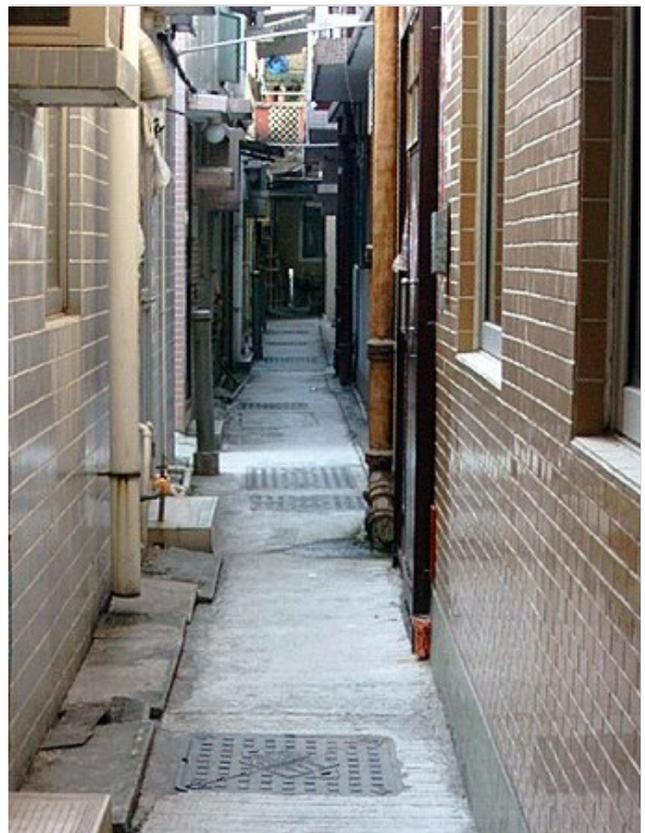
When the villages of Tai Wai and Tai Po in the New Territories of Hong Kong urgently required a replacement for their old septic tanks with a proper sewer system they were faced with a serious problem. They needed a completely new sewerage network, but the very narrow streets would not allow for trench digging machinery and conventional large bore sewage pipes simply could not facilitate the complexity of pipe runs required. Therefore a conventional gravity system could not be used.

Iseki Redivac provided the answer. The Iseki Redivac technology only requires shallow narrow trenches to be dug enabling the connection of approximately 400 buildings. Connection to some of the more remote properties was a challenge to the designers and construction teams with each property seeming to present more obstacles and needing tighter connections.

The principle of the system is that when sufficient effluent has entered the valve chamber it 'triggers' an Iseki Redivac interface valve which introduces vacuum to the chamber drawing the effluent into the sewer pipe at velocities of around 6 meters/second. At this speed the sewers can accommodate tight bends, curves and even inclines whilst providing a self cleaning, low maintenance system.

Vacuum Pipework

Vacuum sewers in PN10 polyethylene pipe sized from Ø90mm to Ø160mm with electro-fusion joints.



Narrow Streets unsuitable for conventional gravity sewerage system

Vacuum Station Equipment

Two vacuum stations each operate with two rotary vane vacuum pumps. The two sets of pumps in Tai Wai and Tai Po stations are rated at 630 m³/hr and 250m³/hr respectively.

The sewage discharge pumps installed are centrifugal screw type pumps supplied by Hidrostal.

Both vacuum vessels are fully coated inside and out as well as being certified to Lloyd's standards. The motor control centre is fully automatic with PLC logic control. All pumps start in rotation and all conditions are monitored with a data logging system.

Summary

For Tai Wai vacuum technology was the only option available to the designers, as the trenches had to be dug by hand. At Tai Po the substantially lower installation costs and the need for fewer pumping stations made the Iseki Redivac system the preferred choice based on cost efficiency alone. The two sewer systems were installed over ten years ago and are still providing a reliable efficient service to the community.

Possible Applications of the Vacuum Way

- Rural community sewerage schemes
- Industrial developments
- Supply bases
- Housing developments / compounds
- Hazardous waste collection
- Airports & military installations
- Beach developments
- Remote villages

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Narrow Passageways



Interface Valve in bespoke chamber



Vacuum Vessel being installed

