

## **PULAU INDAH, INDUSTRIAL PARK, Malaysia**

**Client:** Central Spectrum (M) Sdn Bhd

**Country:** Malaysia

**Length of Pipe:** 5 km

**No. of Valves:** 100

**Peak Flow:** 30 litres/second

**Specialist Feature:** Reduced sewer depths through innovative design to negotiate the deep storm water drains



Pulau Indah is an island off the coast of Malaysia, South-west of the capital city Kuala Lumpur. The ground conditions on the island are mangrove swamp overlain with fine sand and a water table approximately 1 metre below the existing ground levels. With storm water drains installed at depths of up to 3 metres, the previously designed gravity system had main sewers 5 metres deep and 4 pumping stations each at a depth of 10 metres from the finished ground levels. With the existing soil conditions, the difficulty and cost of installing the gravity system made it an unattractive solution for the client.

Iseki Redivac designed a vacuum system with the "crossover" pipes from the valve chambers passing through the storm drains at a high level, thereby allowing the main vacuum sewers to be installed at shallow depths. A single vacuum station replaced the four gravity pumping stations by collecting the sewage from the entire development and pumping it directly to the nearby sewage treatment plant. With sewer and chamber depths being considerably reduced, a 40 % capital cost saving was passed onto the client and the single vacuum station significantly reduced the operation and maintenance costs of the local water authority.



Reclaimed Swamp Land

## **Vacuum Pipework**

Vacuum sewers constructed from PN8 polyethylene pipes jointed using electro- fusion welding techniques.

## **Vacuum Station Equipment**

The two storey station comprises three rotary vane vacuum pumps, a 13.5m<sup>3</sup> vacuum vessel and three centrifugal screw sewage discharge pumps.

A motor control centre complete with PLC logic controls the M&E equipment automatically and notifies the local water authority when attendance is required at the station via an automatic dial-up facility built within the control centre.

## **Summary**

Iseki's innovative approach to design overcame the engineering problems caused by the difficult ground conditions and offered a 40% capital cost saving to the client and reduced the operational costs of the local water authority.

## **Applications for Iseki Redivac's Technology**

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

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Deep Storm Water Drains



Cable works and trenching



High Water Table

Cost effective solutions to many difficult drainage problems