

ZAYED SPORTS CITY STADIUM, UAE

Client: Abu Dhabi Municipality
Country: United Arab Emirates
Length of Pipe: 300 m
No. of Valves: 36
Volume of Flow: 50 litres/second
Specialist Feature: Collects sewage from 70,000 seat stadium



Situated in the heart of Abu Dhabi the Capital City of the U.A.E. is the prestigious Zayed Sports City Stadium, the venue of international sporting events and competitions. Guided by the belief of H.H. Shaikh Khalifa Bin Zayed, the Crown Prince in 1974 the complex was completed by 1980 and has a seating capacity of 70,000 spectators.

The Stadium plumbing and waste water collection system lies deep within the structure and finds its way into a gravity collector sewer constructed in a gallery around the perimeter of the stadium, at depths exceeding 4 metres.

Located in saline water conditions with an upper surface just below the ground level, the prospects of re-laying the sewer in such ground conditions was a daunting if not impossible task. An alternative consideration to reline the damaged pipes was also very difficult primarily due to severe access problems.

Iseki offered the vacuum technology as a solution. The proposal was to intercept the incoming gravity flows above ground in collection sumps and via a vacuum interface valve and ring main collect the sewage in a steel vessel located in the vacuum station cleverly positioned beneath the seating.

Careful design ensured comprehensive operation of the system both under maximum design conditions of 70,000 spectators attending the 1994 Arab Gulf Football Tournament and normal day to day attendance with the very small flows generated by the employees at the complex.

The system whilst being fully automatic is monitored via telemetry in the Town Drainage central control complex thus alleviating maintenance costs but ensuring efficient and continuous working. With the installation now totally above ground future inspections or replacements will be particularly straight forward and cost effective.



Stadium



Opening Ceremony

ZAYED SPORTS CITY STADIUM

Vacuum Pipework

200 mm diameter polyethylene pipework around the service gallery connecting into the vacuum station

Vacuum Station Equipment

3 No rotary vane vacuum pumps each rated at 400m³/hr

2 No dry well discharge pumps each rated at 50 l/sec duty-assist

Vacuum collection vessel volume – 16 m³ fully protected with epoxy coating and tested to Lloyds certification

Motor control cabinet - fully automatic with switchable programmable PLC. All pumps start in rotation and all conditions are remotely monitored via station telemetry in the Town Drainage dept central control which minimises personnel attendance.

Bespoke valve monitoring system which monitors the open / closed mode of each interface valve located around the stadium, the data is transmitted onward to central control such that each point of discharge within the Stadium can be individually observed.

Exhaust gases are filtered by passing them through an activated carbon filtration unit and are finally discharged via a vent stack to the rear of the stadium.

Summary

This project demonstrates the unique versatility and Engineering flexibility of the technology in providing solutions to difficult drainage problems.

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



Interface Valve mounted in wall cabinet



Collection Sump



Discharge Pump and Pipework