TORISHIMA Service Solutions

CASE STUDY

Mitigating Flash Floods

Temporary Pump Stations for Dubai Municipality - April 2024

Snapshot

Organisation: Dubai Municipality

Event: Severe flash flooding in April 2024 (over 220 mm in less than 24 hours) led to extensive flooding across major roads and infrastructure.

Response: The deployment of emergency rental pumps was severely constrained by limited local availability, obstructed roads, and inadequate transportation infrastructure.

Compounding the issue, the stormwater drainage network had already exceeded its capacity, and with no viable discharge outlets, these control efforts were significantly hindered.

Outcome: The stormwater project team engineered an above-ground HDPE pipeline network in close collaboration with Torishima Service Solutions, meticulously selecting optimal pump models to minimise the risk of recurrent disruptions.

Background

In April 2024, Dubai experienced unprecedented rainfall - over 220 mm in under 24 hours, overwhelming its existing drainage and pumping infrastructure.

In response, Dubai Municipality and the Roads and Transport Authority launched an emergency operation involving over 2,500 personnel, 400+ pumps, 300 tanks, and 200+ heavy equipment units to restore normalcy across the emirate.

Key Challenges

Extreme Rainfall: One-day totals exceeded designed system capacity, leading to severe surface flooding.

Critical Infrastructure at Risk: Major thoroughfares, Sheikh Zayed Road, Sheikh Mohammed Bin Zayed Road, Airport Road - faced dangerous water accumulation.

Urgency for Rapid Action: Prevent prolonged traffic collapse and safety threats.

Operational Bottlenecks: Conventional pump priming delays could slow down response time.

Technical Solution

Pump Technology Deployment:

Element	Specification
Pump Model	Torishima TDMH300S17 (12" discharge, 440 L/s at 3 bar)
Engine	Doosan PU126TI with integrated fuel tank and pressure-regulating valves for autonomous performance
Priming System	Twin diaphragm solid-handling with 100 CFM capacity - minimises priming time under emergency conditions

Strategic Deployment:

- Installed temporary pump stations at flood-prone zones
- Semi-permanent setup: Pump connected to HDPE and high pressure hoses, discharging to temporary lagoons and sea outlets
- Continuous operation maintained by rotating field teams

Results & Impact

- **Rapid Activation:** Near-instant operation thanks to fast priming mechanism
- **Increased efficiency:** Each pump delivered ~1,584 m^3/hour of dewatering capability (440 L/s at 3 bar)
- **Advanced material selection:** Key roads cleared swiftly, reducing traffic delays and ensuring commuter safety
- **Monoblock construction:** The one-piece cast design replaced the previous split configuration ('top and bottom half'), eliminating weak points and improving overall structural integrity
- **Operational stability:** Integrated engine and fuel tank design enabled sustained pump function with minimal external support

Pump station - Ras Al Khor Wildlife Sanctuary

Pump station - Nad Al Sheba

Conclusion

Dubai Municipality's deployment of temporary pump stations - equipped with Torishima Service Solutions dewatering pumps, demonstrates remarkable agility in crisis infrastructure management, swiftly addressing the aftermath of the unprecedented April 2024 rainfall and significantly mitigating flood-related disruptions.

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Torishima Service Solutions | Tel: +971 4 880 7344 | Email: sales@tss-ae.com | Website: www.tss-ae.com