

**Detention Tank
Flood Mitigation**

Project Location

Manchester, UK

Project Details:

**ATTENUATION TANKS
MANCHESTER FORT SHOPPING PARK**

Completion

2004

Date

Client

Pillar Property PLC

Catchment Area:

29,730 m² (320,000 sq ft) includes roofs and pavements

Module Type

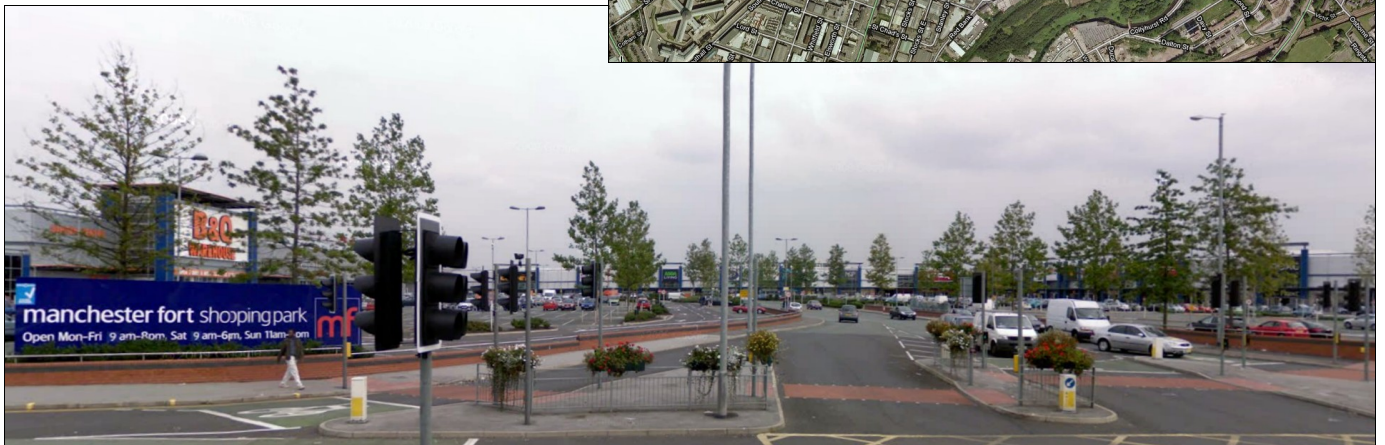
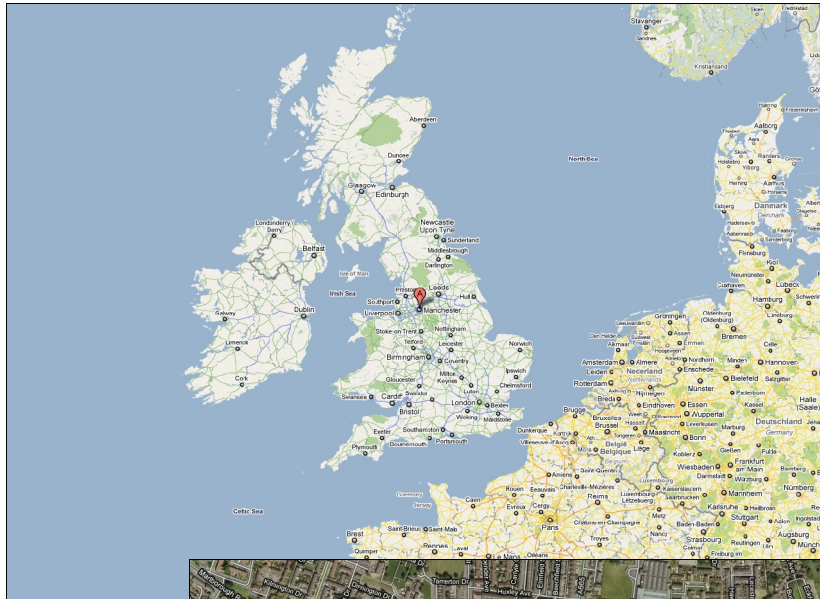
Triple Module (3 High) with 4 small panels (1.31 x 0.41 x 0.685 meters each module 3 high).

Total volume:

1,910 m³

Depth back fill cover:

800 – 3,000 mm



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Challenge:

Manchester Fort Shopping Park development in Cheetam Hill, Manchester is 29,730 m² (320,000 sq ft) area with more than 60% of it is commercial developments. The development had a restriction placed on the discharge of runoff from the greenfield site to the existing main line sewer imposed by the Local Authority.

Engineering Requirements:

The following engineering requirements and issues for dissipating the stormwater were assessed.

- ⤴ Restricted flow into the sewer system
- ⤴ High cover of backfill
- ⤴ Large storage tank required in a restricted limited space

Four separate attenuation tanks proposed were for the site. Stormwater from the roof area and the site is collected in the Atlantis Matrix Tank modules attenuation tanks.

The site has three discharge points into the existing main combined sewer system.

Attenuation Tank 1 – 250 m³

The attenuation tank is made up of triple Atlantis Matrix Tank modules to achieve the required volume with an average backfill cover of 1.5 m. The tank has a 450 mm diameter inlet pipe connected with a bypass interceptor before the tank. The outlet pipe of 225 mm diameter from the tank is connected to the outflow manhole with a flow control device restricting the flow to 80 lts/sec into the existing main combined sewer system.



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Attenuation Tank 2 – 1240 m³

The attenuation tank is made up of triple Atlantis Matrix Tank modules to achieve the required volume with an average backfill cover of 1.5 m. The tank is positioned under the main car park. The tank has two inlet pipes of 750 mm diameter connected with a bypass interceptor before the tank inlet. One of the inlets is the outlet from the attenuation tank 3. The outlet pipe of 225 mm diameter from the main tank is connected to the manhole with a flow control device to reduce the flow to 118 lts/sec into the existing combined sewer system.



Attenuation Tank 3 – 290 m³

The attenuation tank is made up of double Atlantis Matrix Tank modules to achieve the required volume with an average backfill cover of 2.75 m. The tank is positioned under the second main car park.

The tank has two inlet pipes connected with a bypass interceptor before the tank inlet. The outlet pipe of is connected to the manhole with a flow control device to reduce the flow to 80 lts/sec into the Attenuation tank 2.



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Attenuation Tank 4 – 130 m³

The attenuation tank is made up of treble Atlantis Matrix Tank modules to achieve the required volume with an average backfill cover of 3.0 m. The tank is positioned under the loading bay near the warehouse. The tank has two inlet pipes of 225 mm diameter connected with a bypass interceptor before the tank inlet. The outlet pipe of 375 mm diameter from the tank is connected to the manhole with a 225 mm diameter orifice flow control device to reduce the flow into the existing main combined sewer system.

Attenuation tanks constructed using Atlantis Matrix Tank modules are sealed using impermeable geomembrane to form a water storage system and thereby reducing the peak storm flow into the combined sewer system achieving the required discharge of the Local Authority.

Benefits:

- ⤴ Flexible ideal site solutions (High void ratio and High load bearing capacity)
- ⤴ More efficient design e.g., several tanks making design simpler
- ⤴ Less excavation required
- ⤴ Installation time reduced (from 3-4 weeks to 5 days)
- ⤴ Innovative, Site flexible and Economical solutions