



1. Scope

To assess the performance of JFC Manufacturing Co. Ltd's "HydroChamber". The plastic HydroChamber product is used to construct underground soakaways or open-top detention tanks for surface drainage systems.

The "HydroChamber" system operates with the storm water entering the structure through the perforated distribution pipe which then permeates through the voids in the stone backfill and into the storage capacity created by the HydroChamber. There is also a direct manifold connection between the distribution pipe and a minimum of four rows of chambers. When the storm event subsides the attenuated water is discharged by gravity to the drainage network at the allowable discharge rate.

Each "HydroChamber" has a nominal capacity of 1.4m³, with the system having a storage volume of between 2.1m³ and 2.8m³ per chamber depending on foundation depth and distribution pipe size. The system can be built up using a number of chambers to create the required storage volume. The arched shape of the "HydroChamber" makes economic use of an excavation by providing the necessary volume and the surrounding granular material provides the load bearing capacity.

The "HydroChamber" soakaway system uses a non woven geotextile to line the excavation and roof of the system which allows the water to infiltrate the ground.

The open-top detention tank system uses a geomembrane lining installed on the side walls and base only with a non woven geotextile on the roof. This allows infiltration into the tank from the ground above (e.g. permeable pavement). It does not therefore provide a fully sealed underground detention tank.

Where the "HydroChamber" is installed with a plastic or rubber based geomembrane, a protective geotextile is used to protect both faces of the geomembrane.

All components that make up the "HydroChamber" are manufactured by JFC Manufacturing Co Ltd and their sub contractors using high density polyethylene (HDPE) and medium density polyethylene (MDPE):

- main chamber;
- end cap 1 (flat for pipe connection);
- end cap 2 (domed no connecting pipe);
- distribution pipe and manifold.

The "HydroChamber" components are detailed on the following drawings:

- HydroChamber: P06037-006 (HDPE);
- Pipe Cut Out End Cap: P06036-000 (MDPE);
- Domed End Cap: P06053-000 (MDPE).

Note: The designer should be aware that the "HydroChamber" is not fully encapsulated therefore if the ground water level rises above the level of the geomembrane it can enter the attenuation area and discharge into the storm water system. Similarly when an extreme event occurs, greater than the maximum design, the



attenuated water would overflow into the surrounding ground.

2. Assessment schedule

- 2.1 Review of type test data and witness testing;
- 2.2 Audit of the production quality control systems;
- 2.3 Review of design guidance for the "HydroChamber" system;
- 2.4 Review of guidance for installers including on-site witnessing of installation;
- 2.5 review of operational practices.

3. Type Testing

Loading tests shall be carried out to verify the guidance provided in the HydroChamber Design Manual on structural design. Type testing results in the Final Report⁽¹⁾ shall be audited to check the test results.

4. Production quality audit

An audit of the production quality control systems procedures of the manufacturer shall be undertaken and a visit to the manufacturing premises made to witness the production process.

The quality control records for the manufacturing process shall be checked.

5. Design review

The structural and hydraulic design procedures in the Design Manual⁽²⁾ for the "HydroChamber" system for use as both soakaways and open-top detention tanks shall be reviewed.

A number of actual project designs shall be selected by WRc and reviewed with respect to long-term operations and maintenance.

The information provided to designers shall be reviewed to check for completeness, accuracy and compliance with JFC's structural and hydraulic design procedures.

6. Installation

The installation manual⁽³⁾ for the "HydroChamber" system for use as both soakaways and open-top detention tanks shall be reviewed.

WRc shall witness an installation of the "HydroChamber" system and audit these against the installation manual⁽³⁾.

Note: All installations are carried out or supervised by an experienced JFC trained supervisor or installation team. This ensures the quality of materials and installation practices are in accordance with the design specification and installation manual.

7. Operational Practices

WRc shall inspect an operational "HydroChamber" open-top detention tank with respect to long-term operations and maintenance.

The guidance provided in the Design Manual⁽²⁾ for the operations and maintenance for the "HydroChamber" system for use as both soakaways and open-top detention tanks shall be reviewed.

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**Assessment of JFC Manufacturing Co. Ltd's
HydroChamber**



independent certification of your products & services

8. Reference documents

1. HydroChamber Structural Design and Testing Final Report. HC800-SDT May 2008.
2. HydroChamber Stormwater Management System Design Manual. Document D-HC-DM Revision 012 09/06/2008. JFC.
3. HydroChamber Storm water Management System Installation Manual. Document D-HC-IM Revision 002 09/06/2008. JFC.