



**Product Version**

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Flo-Tank® XD

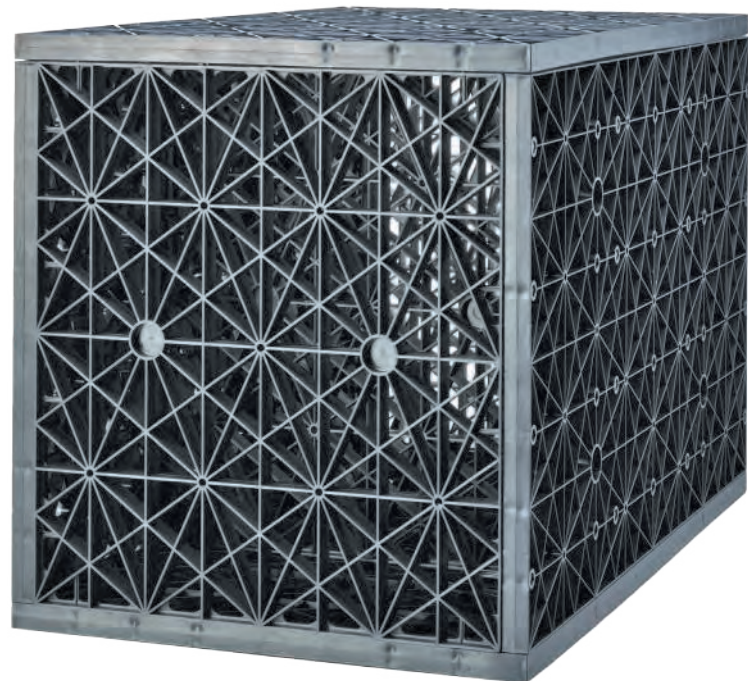
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22-10-2021 AM/CU

# **Flo-Tank®**

**MODULAR UNDERGROUND TANK SYSTEM**



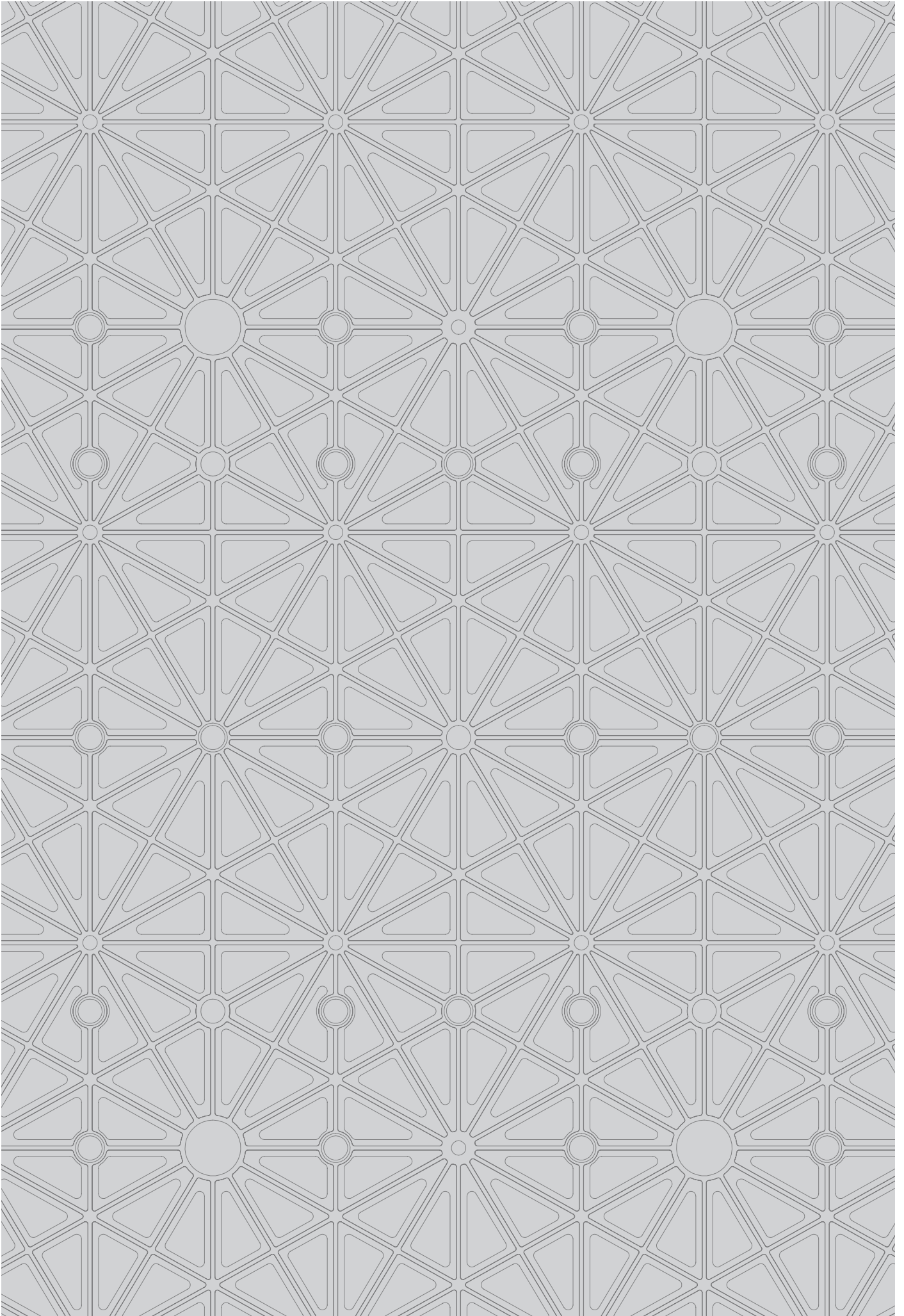
**APPLICATIONS COVERED:**

- Infiltration Tanks
- Re-use Tanks (Rainwater Harvesting Tank)
- O.S.D (On site Detention Tanks)

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## **Assembly & Installation Guide**

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## Additional Materials Required

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### Backfill Materials

- Washed River Sand (Technical specifications available upon request)
- Aggregate / Gravel 20mm (3/4") (Technical specifications available upon request)
- Growing Media, in accordance to local guidelines.

### Other Materials

- Duct Tape
- Firestone Butyl Tape or equivalent (For pipe boot connections to liner)
- Stainless Steel Pipe Clamps
- PVC Pipes

### Machinery

- Hand Held Compactor
- Excavation Machinery
- Equally distributed load light vehicle (PT-30/50 Terex or similar)

### Geo Membranes

- Hydrophilic Geotextile
- Geo Grid, BX-1200 or equivalent if specified by engineer.
- Plastic Liner
  - 0.75 mm (0.03") HDPE (Suitable for welding)
  - 1 mm (0.04")HDPP (Suitable for welding)

### Pre Filtration Devices

- Atlantis Flo-Screen® small
- Atlantis Flo-Screen® large
- Standard Sediment and Gross Pollutant Trap
- Expanded steel mesh, galv. /zinc coated (Maximesh RH3030 or equiv.)
- Proprietary Sediment, Grease and Gross Pollutant Traps from various manufacturers
- Infiltration Swales with Flo-Tank® or Flo-Channel® for optimum flush-out.

## Atlantis Flo-Screen® filtration units

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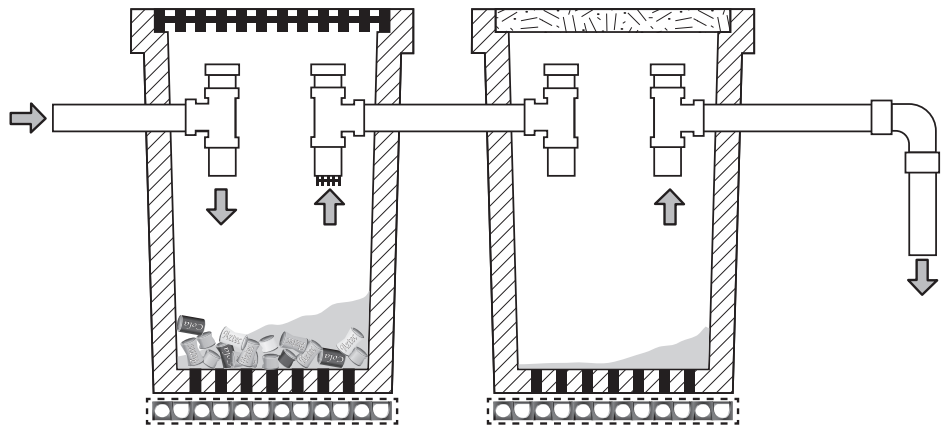
These in line filters are designed to remove gross pollutants, such as vegetation matter and silt from roofs and stormwater pits before allowing water to enter the Atlantis tank system.



## Double Pit Design Sediment & Gross Pollutant Trap for Commercial Applications

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This in line filter removes gross pollutants and sediments from entering the Atlantis modular tank system. It is assembled on site from standard stormwater components commonly available in the market place. This pit design is scalable to suit the flow requirements of the project.





# Important Design & Installation Considerations

## 1. CONSTRUCTION OF ATLANTIS SYSTEM WITHIN A PROJECT

Review Atlantis installation procedures and engineering drawings and specifications thoroughly, if in doubt contact Atlantis Technical support team at [technical@atlantiscorp.com.au](mailto:technical@atlantiscorp.com.au) or call Atlantis on +61 2 9417 8344 on Australian Eastern Standard time between 8:30am and 5 pm Monday to Friday.

For determining up to date time from your location visit [www.timeanddate.com](http://www.timeanddate.com)

Carefully plan and coordinate the installation of the Atlantis system with other work on the project such as grading, excavation works, utilities installation, construction of access roads, site compaction and erosion management. The following documents shall be submitted to the engineer: Geotechnical design report and all relevant design information (elevation plans, site photos, hydrological/hydraulic studies etc.)

## 2. CONSTRUCTION & SITE TRAFFIC

Keep all construction traffic away from the limits of excavation until the project is completed and final surface materials are in place as approved by engineer or project manager in charge. Provide for a minimum setback of 5 m (16.4 ft)

- Prevent all non-installation related construction traffic from being around the Atlantis underground system when work is in progress.
- Ensure adjacent work does not negatively impact the installation of the Atlantis system.

## 3. POST CONSTRUCTION SIGNAGE

After installation is finalized install permanent signs that display warnings of maximum loadings allowable over the tank installation. *See appendix 1.*

## 4. APPOINTED CONTRACTOR PERFORMING INSTALLATION

Installation must be performed only by skilled and competent contractors with satisfactory record of performance and quality on underground installations. Contractors must adhere to the Atlantis installation guidelines and engineering specifications. If the plans or drawings conflict with our installation guide, please notify our office.

## 5 INSTALLATION APPROVAL CONSIDERATIONS

Engineering specifications must provide adequate *Partial Factors of Safety* for creep, static and dynamic loads as per AS4678, AS2566, AS5100 and AS1170. Other factors that must be taken into consideration are geo technical evaluation of the site for ground conditions that are seasonal, telluric and contains soils that is prone to liquefaction.

## 6. INSTALLATION APPROVAL

Installation approval constitutes acceptance of existing conditions and the chain of responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact the Specifying Engineer for further advice.

## 7. SUITABLE SUBSTRATE FOR INSTALLATION

Check that substances that can deteriorate the plastic are not present at excessive concentration.

It is highly suggested to carry out a size specific check on this.

For OSD, the geomembrane around the system will prevent cross contamination, however an appropriate geomembrane should be chosen.

## 8. SITE CONTAMINATION

When considering the use of Atlantis System in contaminated ground one should insure substances that can cause deterioration of plastics are not present at excessive concentration levels.

## 9. INFLOW WATER QUALITY

All water entering the system must be filtrated, free of gross pollutants, silts, litter, grit, sediments, oils and associated aromatic chemicals that can cause deterioration of the system, as the following chemicals: Benzene and derivatives, Acenaphthene Benzo-perylene, Carbon, Tetrachloride, Heptane, Kerosene Mineral Oil (White), Nitric Acid, Sulphuric Acid and Toluene chemicals are not recommended for polypropylene.

## 10. GEOTEXTILE REQUIREMENTS

For all applications, the geotextile should be **HYDROPHILIC**. The molecular properties of Hydrophilic geotextiles attract and absorb water. Geotextiles that are HYDROPHOBIC repel water due to the molecular structure and are not suitable for use with Atlantis products.

### Recommended Geotextile:

- Infiltration: 125 g/m<sup>2</sup> (3.69 oz/yd<sup>2</sup>)
- Onsite detention tank: 250 g/m<sup>2</sup> (7.37 oz/yd<sup>2</sup>)
- Characteristics - Hydrophilic nonwoven geotextile made of polypropylene high tenacity staple fibres, with added carbon black for a UV exposure, needle punched and calendered. Not produced with any use of glues or chemical binders and post-consumer raw material.

## 11. HYDROPHILIC GEOTEXTILE TEST

A simple test to determine whether the geotextile is Hydrophilic is to use a square piece of geotextile 150mm (6") in size. Take the geotextile sample and place it over a drinking cup. Use tape to secure it around the cup to form a spanned surface. Then place a few drops of water onto the surface. If the geotextile immediately attracts the water and allows the water to drain through it is Hydrophilic. If the water sits on top of the geotextile and forms droplets it is Hydrophobic. Hydrophobic geotextiles may require a head of pressure to perform however they are NOT suitable for use with Atlantis products.

## 12. DISTANCE FROM EXISTING STRUCTURES

Before excavating please check soil types to determine the minimum distance of the excavation from existing structures.

| Soil Type                   | Typical Hydraulic Conductivity (cm/s) | Typical Hydraulic Conductivity (mm/hr)<br>(inches/hr) | Modification Factor (U) | Minimum Setback Distances from structures and boundaries (m) (ft) |
|-----------------------------|---------------------------------------|---|-------------------------|---|
| Sand                        | 5.00E-03                              | 180 (7.08")   | 0.5                     | 1.0 (3.28 ft.)  |
| Sandy Clay                  | 1.00E-03 - 5.00E-03                   | 36 - 180 (1.42 - 7.08")                               | 1.0                     | 2.0 (6.56 ft.)  |
| Weathered or Fractured Rock | 1.00E-04 - 1.00E-03                   | 3.6 - 36 (0.14 - 1.42")                               | -                       | 2.0 (6.56 ft.)  |
| Medium Clay                 | 1.00E-04 - 1.00E-03                   | 3.6 - 36 (0.14 - 1.42")                               | 2.0                     | 4.0 (13.12 ft.)   |
| Heavy Clay                  | 1.00E-06 - 1.00E-04                   | 0.036 - 3.6 (0.0014 - 0.14")                          | 2.0                     | 5.0 (16.4 ft.)  |

**13. ATLANTIS PRODUCTS ARE MANUFACTURED FROM 100% RECYCLED MATERIALS**

Atlantis products are manufactured from 85% recycled polypropylene and 15% proprietary selected materials.

**14. EXCAVATION, BACKFILL & TANK LOADING REQUIREMENTS**

The excavation for Atlantis tank modules must consist of the following parameters:

**EXCAVATION DEPTH = Base Fill + Tank Height + Specified Backfill Height**

**EXCAVATION AREA = Tank Footprint + Minimum Side Backfill**

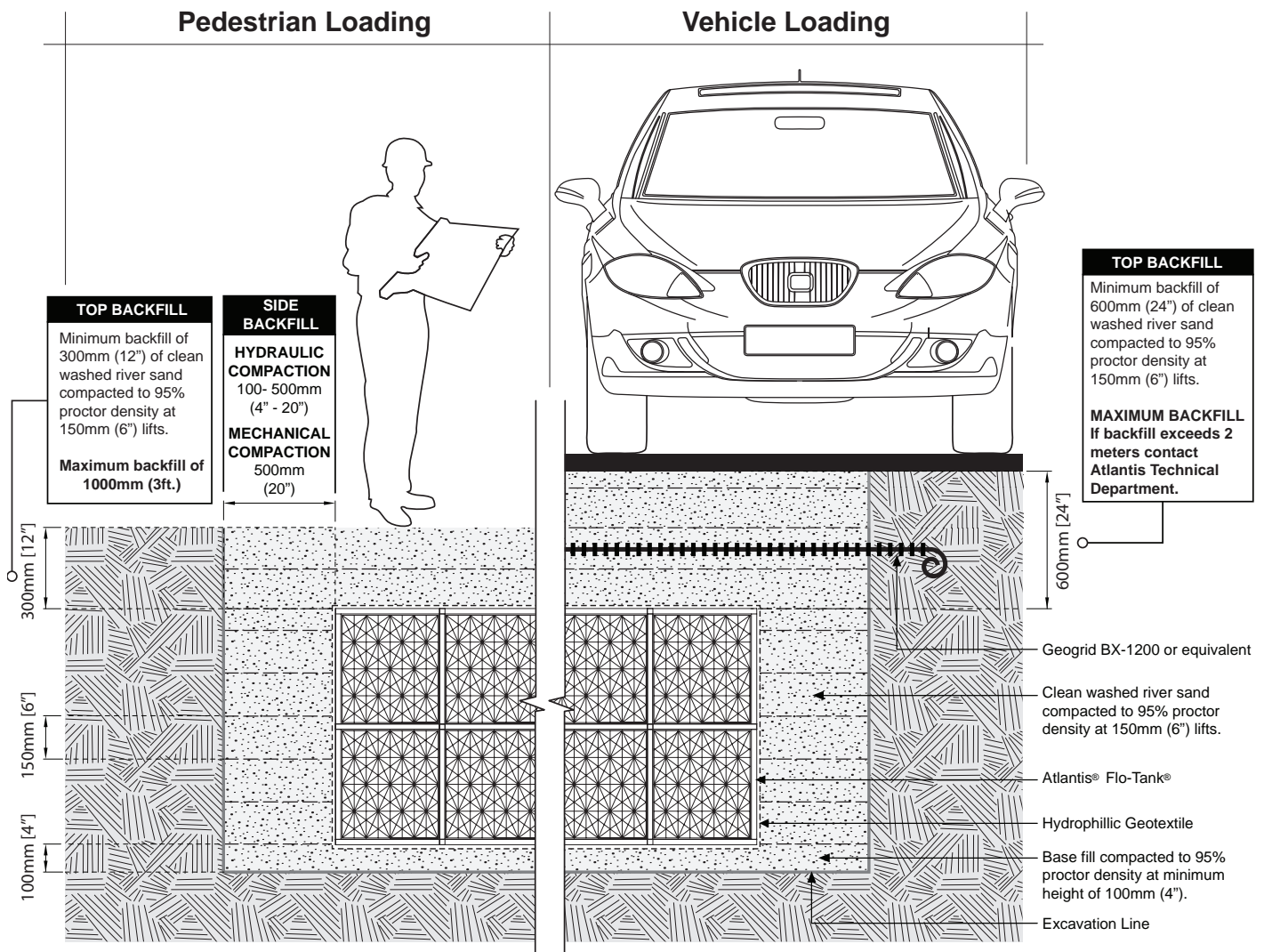
**ATLANTIS FLO-VAULT® MINIMUM TOP COVER & BACKFILL REQUIREMENTS**

| FILL                     | PEDESTRIAN TRAFFIC             | VEHICLE TRAFFIC                |
|--------------------------|--------------------------------|--------------------------------|
| BASE FILL                | 100mm (4")                     | 100mm (4")                     |
| <b>SIDE BACKFILL*</b>    | <b>300 - 500mm (12" - 20")</b> | <b>300 - 500mm (12" - 20")</b> |
| <b>BACKFILL HEIGHT**</b> | 300 (12")                      | 600 (24")                      |

**\*SIDE BACKFILL**

For installations that have limited footprint available, 100mm (4") can be applied if approved by specifying engineer. Narrow side backfill must be compacted to 95%. For installations into reactive soils or clay a minimum of 500mm (20") side backfill is required.

**IF BACKFILL EXCEEDS 2 METERS CONTACT ATLANTIS TECHNICAL DEPARTMENT.**





## 15. SUITABLE STRUCTURAL BACKFILL

**S** = Coarse Washed Sand with less than 5% fines passing 75 micron sieve

**A** = Aggregate of angular material up to 19mm (3/4")

|                      | Infiltration | Rain Harvesting | Detention |
|----------------------|--------------|-----------------|-----------|
| <b>Base Backfill</b> | <b>S</b>     | <b>S</b>        | <b>S</b>  |
|                      | <b>A</b>     | <b>A</b>        | <b>A</b>  |
| <b>Side Backfill</b> | <b>S</b>     | <b>S</b>        | <b>S</b>  |
|                      | -            | <b>A</b>        | <b>A</b>  |
| <b>Top Backfill</b>  | <b>S</b>     | <b>S</b>        | <b>S</b>  |
|                      | -            | <b>A</b>        | <b>A</b>  |

**Note:** Technical specifications available upon request

## 16. INSTALLATION OF POLES, DEEP FOOTINGS, SERVICES NEAR TANK INSTALLATION

Any excavation of Light Poles, Closed-circuit Television (CCTV) Poles or any similar structure above or below ground must be kept 5 meters (16.4 ft) away from the excavation perimeter. Ensure piling machinery is kept 3 meters (9.8 ft) away from the excavation perimeter. The zone of influence of any adjacent excavation could extend up to approximately 2 to 3 times the depth of the excavation producing ground movements. These recommendations must be reviewed and approved by a suitable qualified engineer.

## 17. EARTHWORKS NEAR ATLANTIS UNDERGROUND TANKS

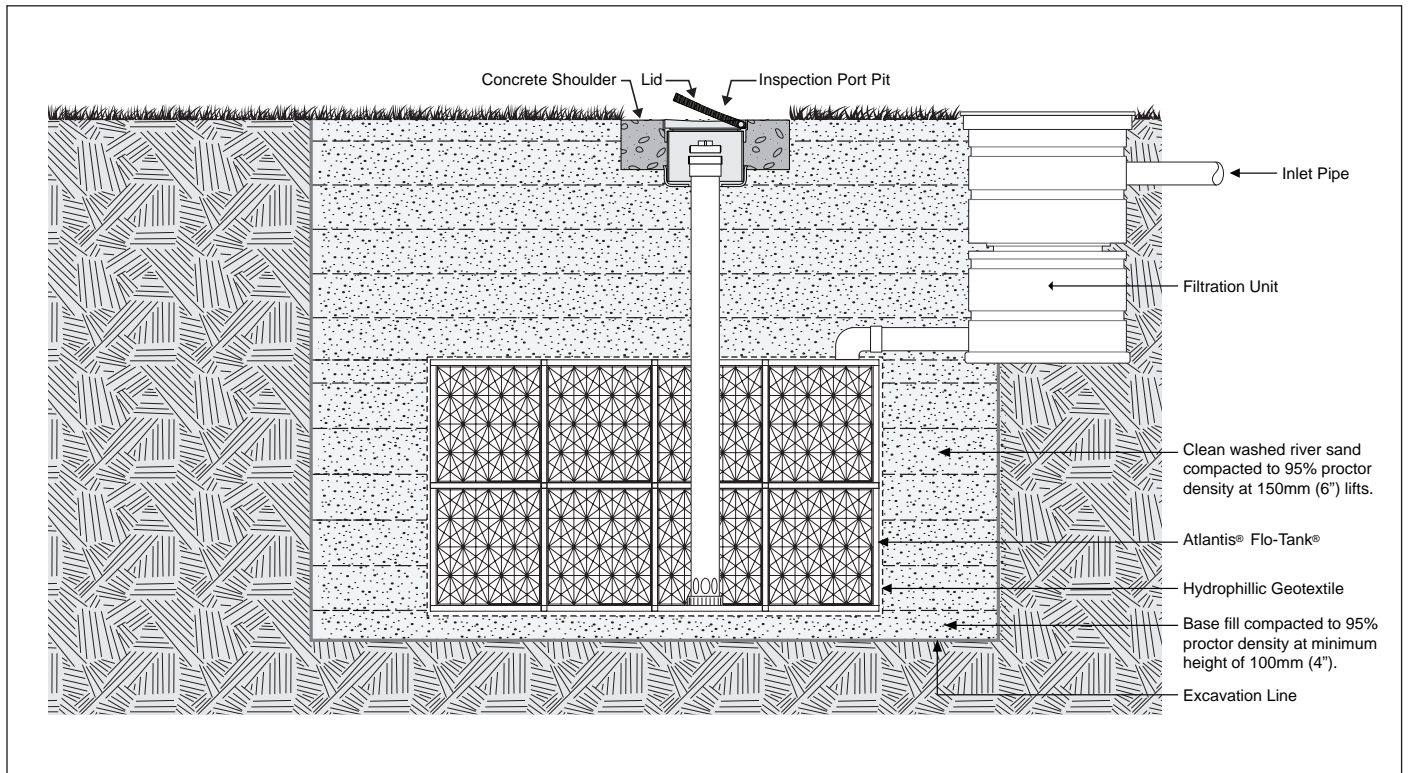
When excavating adjacent to the Atlantis tank there is a risk of destabilising the pre-excavation ground stress. This ground stress is established soon after the installation of the Atlantis tank and keeps the tank in force equilibrium. Proposed excavations in close proximity are therefore not permitted if there is risk of structural failure or potential collapse of the Atlantis tank.

It is the owners responsibility to ensure all parties proposing excavations near the Atlantis tank, whether external to or within the owners property boundaries, have been granted approval from qualified structural and geotechnical engineers. This approval should be in the form of a certificate by a competent structural/geotechnical engineer with relevant engineering authority based on results of an appropriate geotechnical or structural investigation.

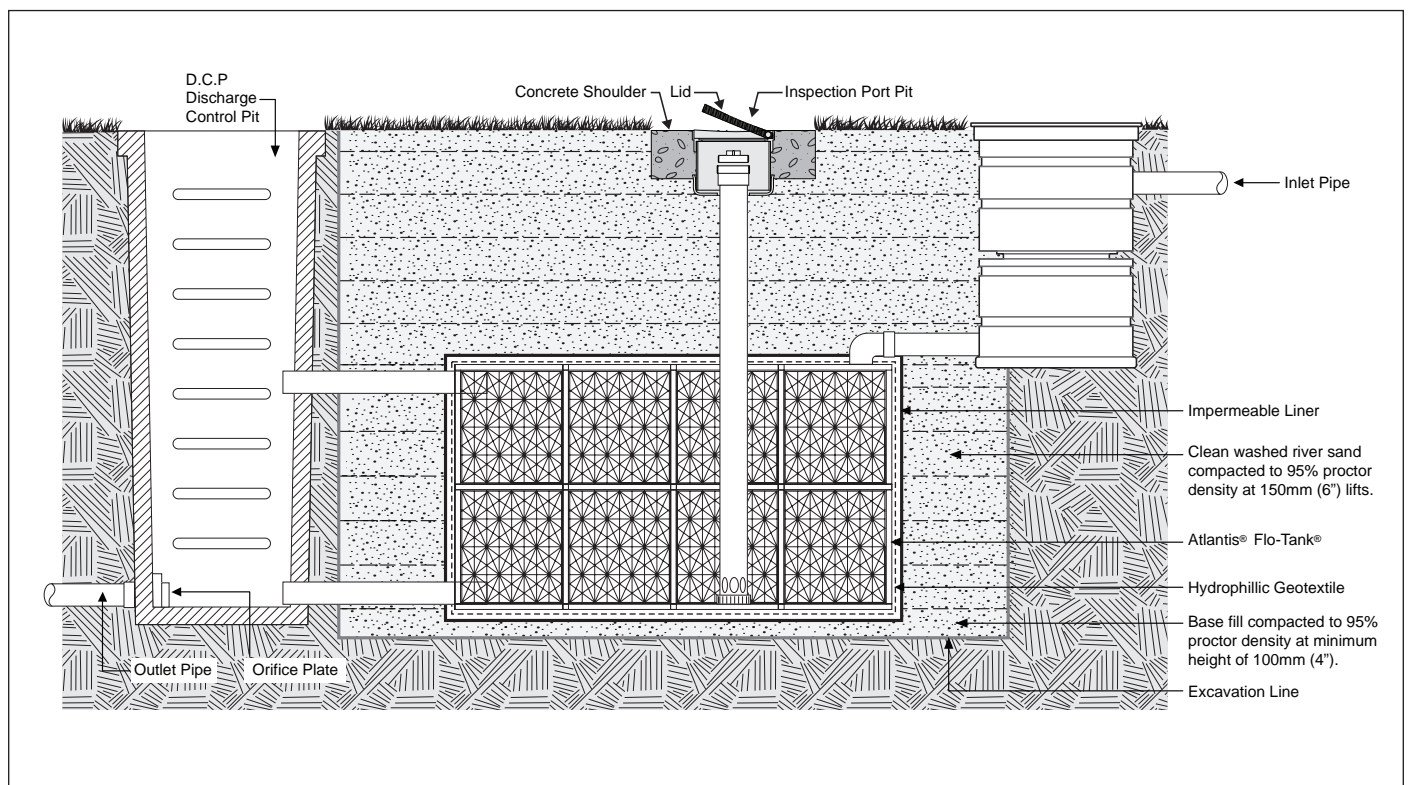
**IMPORTANT: THE GROUND STRESS SURROUNDING THE ATLANTIS TANK MUST BE PERSEVERED TO ENSURE THE STRUCTURAL INTEGRITY OF THE TANK SYSTEM.**

## Tank Applications

### Infiltration Tank (Absorption)

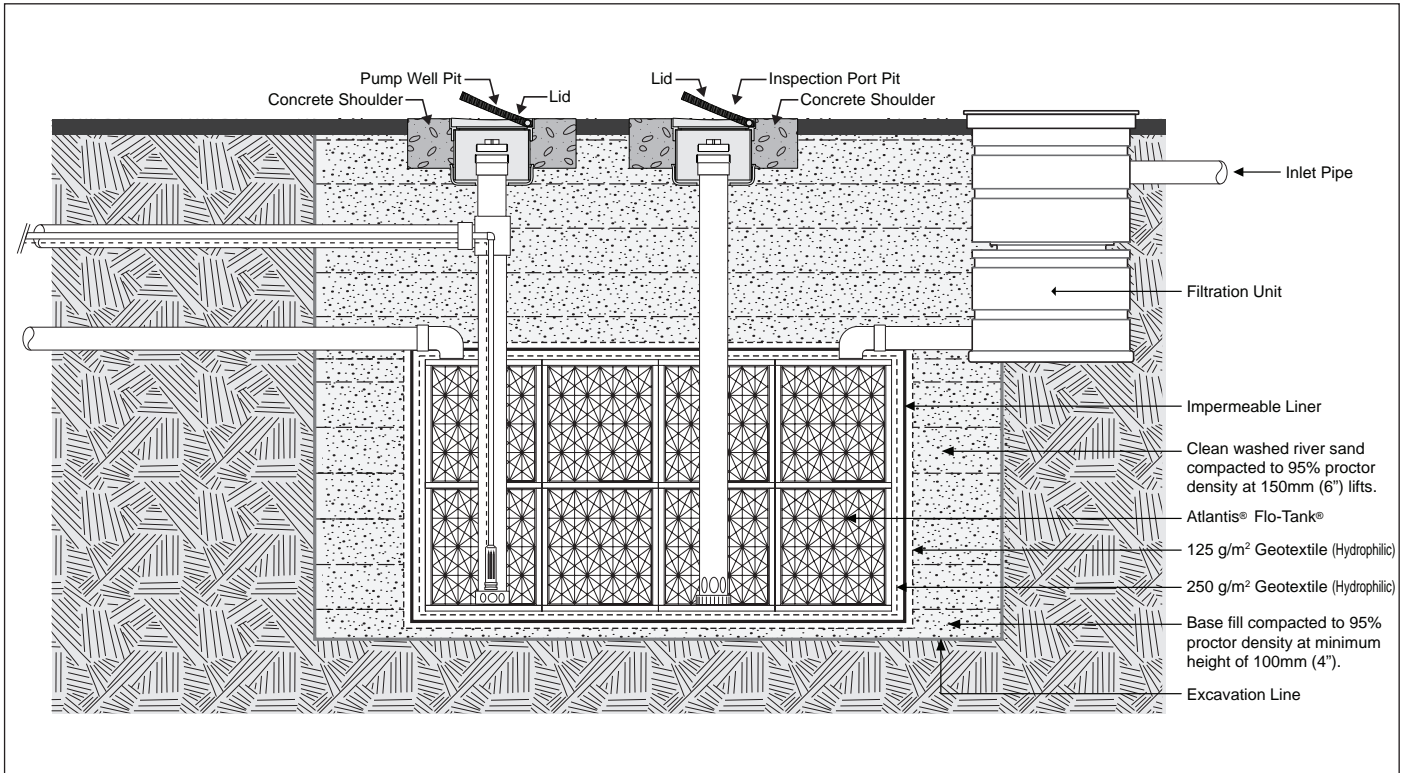


### O.S.D Tank (On-Site Detention)

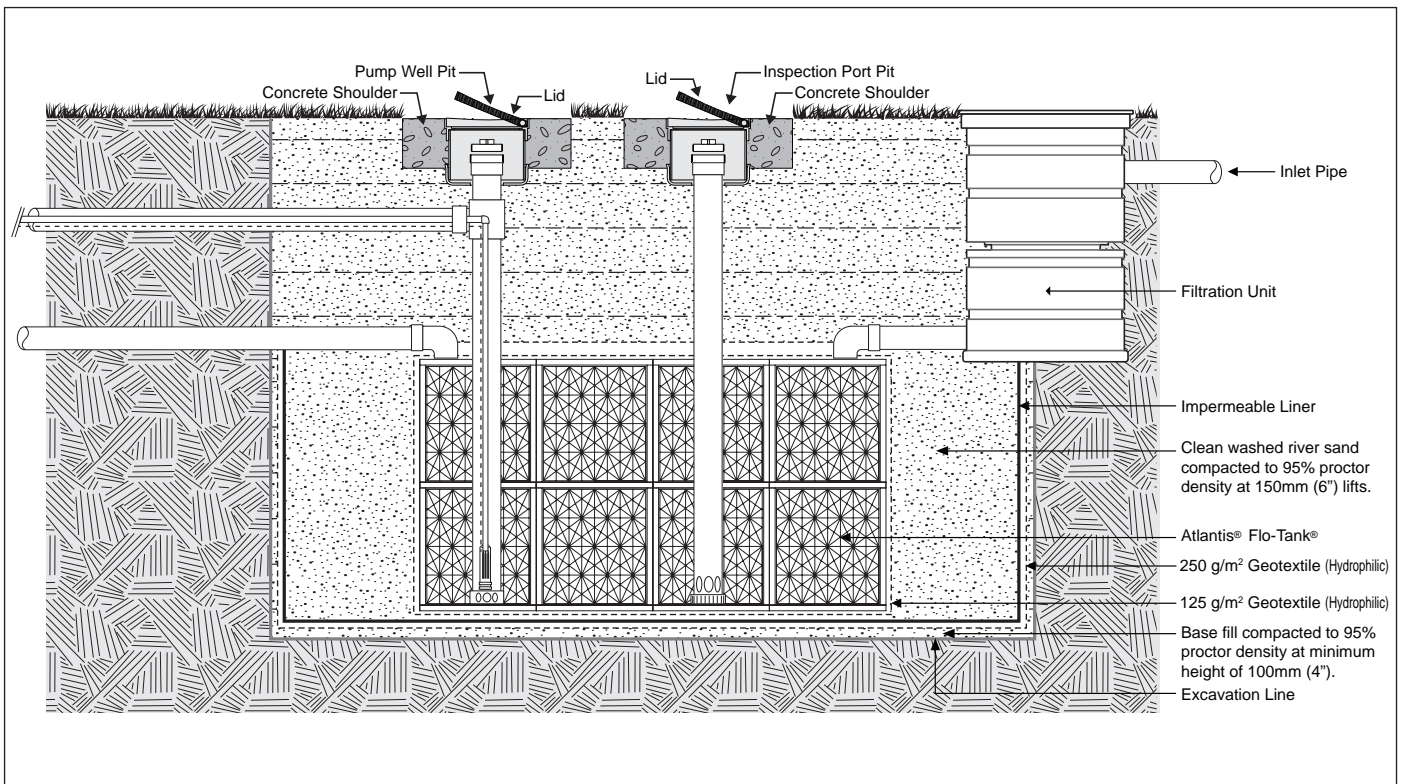


Tank Applications

## Rainwater Harvesting (Sealed Version)

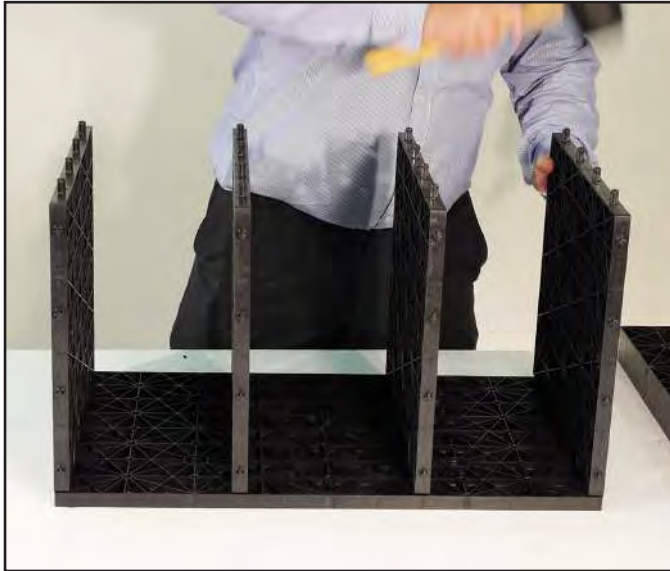


## Rainwater Harvesting (Sand Lined Version)



## Flo-Tank® Module Assembly Guide

Atlantis Flo-Tank® modules are shipped as flat pack components that need to be assembled into modules on site.



### Module Assembly Time

The time required to build a 4 plate configuration Flo-Tank® modules are as follows:

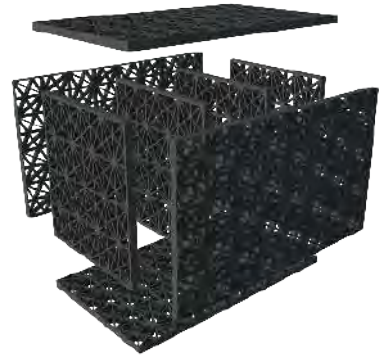
|        |   |           |
|--------|---|-----------|
| Mini   | = | 1 minutes |
| Single | = | 1 minutes |
| Double | = | 2 minutes |
| Triple | = | 4 minutes |
| Quad   | = | 6 minutes |
| Penta  | = | 7 minutes |

**NOTE:** Completed tank modules should be staged as close to the installation area as possible, in order to avoid excessive handling.

## Flo-Tank® Strength Configurations

Atlantis tank modules can be configured to suit your project design life requirements.

### 4 PLATE CONFIGURATION



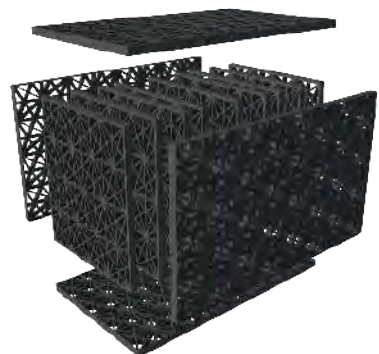
### 5 PLATE CONFIGURATION



### 7 PLATE CONFIGURATION



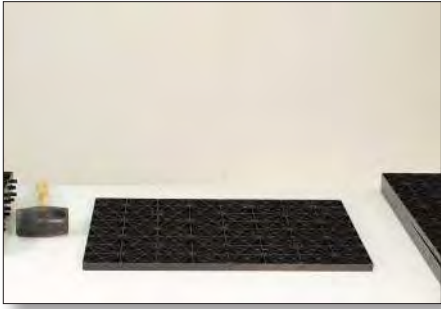
### 9 PLATE CONFIGURATION



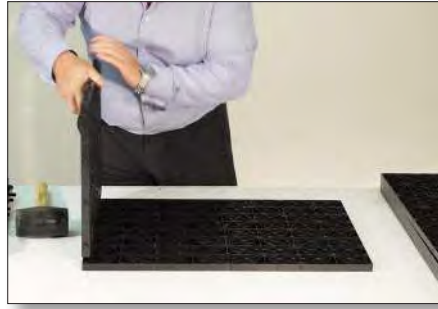


## Flo-Tank® 4 plate module assembly.

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Place large plate onto work bench.



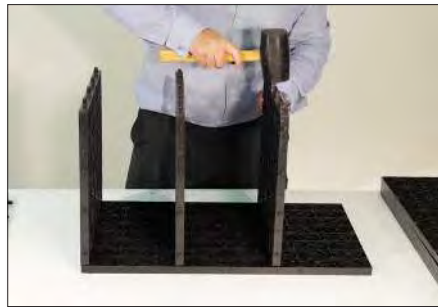
Align small plate pins with the holes on the large plate.



Insert small plate into large plate.



Position the 2nd small plate and insert into the large plate.



Repeat the insertion process for the small plates.



Firmly insert the small plates into the large plates.



Align the pins on the small plate with the top large plate and insert into place.



Use a rubber mallet to hammer the pins to ensure a tight fit.



Flip the Flo-Tank® module onto its side.



Place the large plate on top of the semi assembled module and fit into place. Use a rubber mallet to securely fit the pins into place.



Flip the module over again and repeat the last step.

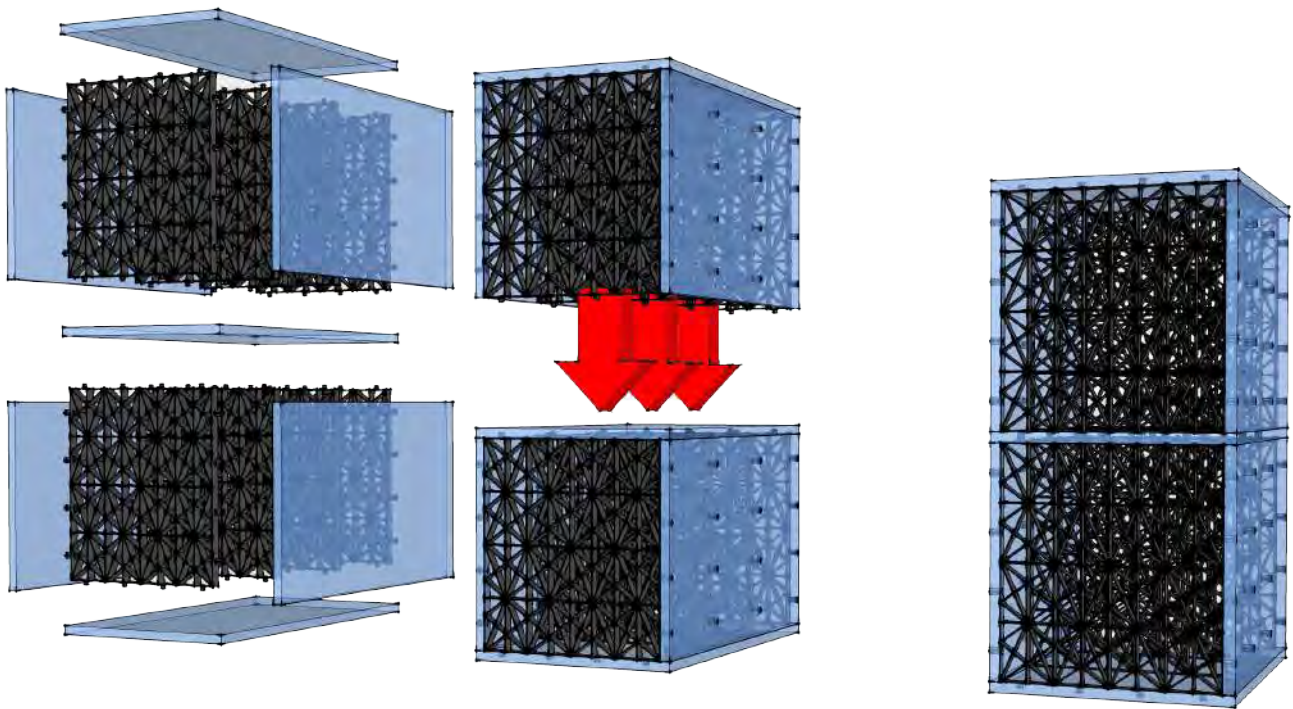


Completed Flo-Tank® module.



## Flo-Tank® Double, Triple, Quad and Penta Assembly Guide.

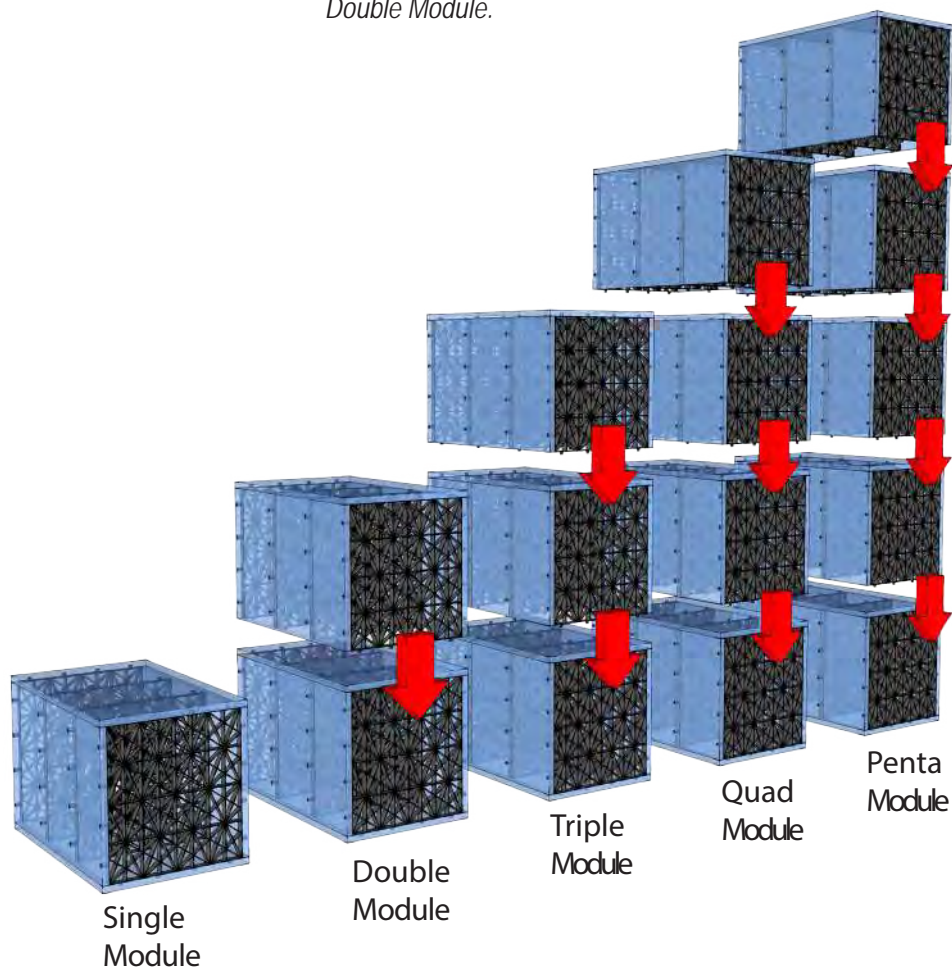
The Atlantis Flo-Tank® modules can be configured into taller modules by simply attaching an additional module on top of a single module. Tall Flo-Tank® modules use a common plate in between. The additional modules must be constructed without a bottom plate. The exposed pins are used to clip into the single module.



*Exploded view of the Flo-Tank® Double Module.*

*Attaching the additional module to the Single Module to create a Double Module.*

*Completed Flo-Tank® Double Module.*



Single Module

Double Module

Triple Module

Quad Module

Penta Module

## STEP 1 - EXCAVATE



### EXCAVATION FOOTPRINT

(Tank Length) + (Tank Width) + (Minimum Side Backfill)  
**= (EXCAVATION FOOTPRINT)**

### EXCAVATION DEPTH

(Tank Depth) + (Minimum Top Cover) + (Base Layer)  
**= (EXCAVATION DEPTH)**

Prepare excavation as per geo technical engineer's specifications and/or as shown on engineering drawings. The excavation must be level before the base fill can be applied.

Examine prepared excavation and conditions for level smoothness and compaction. Correct unsatisfactory conditions before commencement of base preparation layer.

Check for the presence of soft or muddy soils. Insure the presence of a high ground water table is at least 1m (3ft) feet below the bottom of the Atlantis Tank structure at all times.

Ground foundations with a clay profile are considered non-standard conditions. The design must be approved by a geotechnical engineer.

**HEAVY RAINFALL EVENTS:** If a high ground water table is likely to rise during a heavy rainfall event then adequate sub surface drainage is required to alleviate hydrostatic pressure on the tank structure.

## STEP 2: PREPARE BASE



### Base Layer Installation

Apply a level base of 100mm - 200mm (4" - 8") of smooth clean washed sand, free from lumps and debris or any other sharp materials and compact to 95% modified proctor density.

Structural fill material of either washed sand or gravel of 19mm (3/4") in size is acceptable for base materials. Technical specifications are available upon request.

The foundation should achieve a CBR of 3-5% and be checked by the authorised engineer.



### STEP 3: PLACE GEOTEXTILE TO WRAP TANK



Ensure the geotextile is hydrophilic. Refer to the geotextile guide lines for more information. Lay the geotextile into the excavation. Use sandbags or heavy objects to temporarily secure the geotextile at the top of the excavation to prevent the fabric from falling into the excavation.

Over lap the edges by a minimum of 300mm (12"). Ensure 300mm of geotextile is available on the ends to wrap over the tank system.

### RAINWATER & O.S.D TANKS ONLY

#### STEP 3 B: LAYING THE IMPERMEABLE PLASTIC LINER ALONG THE BASE AND UP THE SIDES



Lay impermeable liner into the excavation and spread out evenly. Ensure the Impermeable liner is centred into position and that the minimum allowable overlap of 1m (3ft.) is available on all edges of the tank system to fold over the top of the tank system.

Take care not to tear or puncture the liner. Overlapping edges and joins should be welded by an experienced polyplastic welder. Tank configurations should have as few welded joints as possible.

#### STEP 3 C: LAYING PROTECTIVE LAYER OF GEOTEXTILE

Lay geotextile fabric into the excavation as a protective layer between the impermeable liner and the Atlantis Flo-Vault® modules.

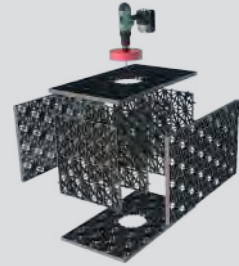
Secure overlapping edges with duct tape.





## STEP 4: INSTALL TANK MODULES

**IMPORTANT:** Before assembly of the tank structure check plans to evaluate positions of MAINTENACE PORTS and INSPECTIONS PORTS and take note of their position. Where these ports are to be installed the Flo-Tank® modules must have the center cut out with a 6" holesaw to allow the pipe to be inserted through the modules. Place these cut modules aside and install them into their correct location during the assembly of the main tank structure. The base of the module located at the bottom of the tank does not require the center cut out.



The boundaries of the tank is best carried out by surveyors to ensure a straight installation. Commence the tank assembly in the area where critical pipe connections need to be made. Place the modules into the corner of the excavation following the string lines as a guide.

STRING LINES FACILITATE INSTALLATION OF BASE LAYER



INSTALLING FLO-CELL® CAPPING LAYING OVER TANK MODULES



INSTALLING TANK MODULES





## STEP 5: INSTALL MAINTENANCE PORTS

### INSPECTION • MAINTENANCE • VENTILATION

For large tank systems in the order of over 10,000L and over it is recommended to use multiple maintenance ports, as an estimate, one for every 25,000L of volume.

Typically made from PVC pipe, these provide vertical access into the system. They should be long enough to sit on the base plate of the Flo-Tank® module, rising to the finished surface where they are capped.

Prior to installation, the large plates for the modules that will incorporate the PVC inspection/maintenance ports must be cut out prior to module assembly.

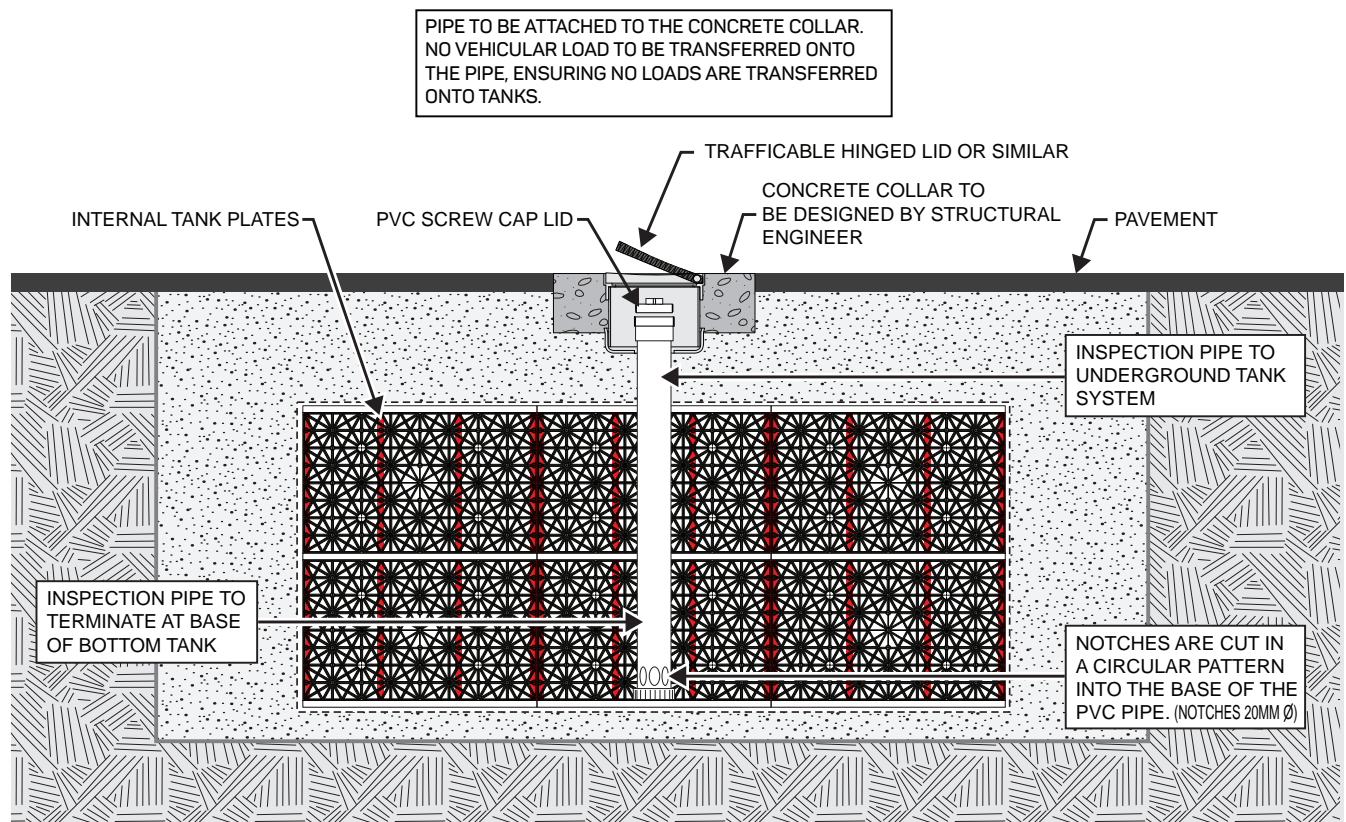
1. Ventilation ports can be installed with a single pipe protruding from different equally spaced sections of the tank. These pipes should be placed in all underground tanks, whether for infiltration, detention or retention. A perforated pipe with a diameter of 150mm (6 inches). This is drilled into the center of the module. These ports allow the system to breathe and prevents a vacuum from forming when large quantities of water is withdrawn from the tanks.



**NOTE:** ENSURE INSPECTION PIPES ARE CAPPED TO PREVENT DEBRIS ENENTERING THE SYSTEM.

2. Maintenance ports or inspection ports are used as access openings for flushing the system or for cameras/ visual aide instruments respectively. They are important for flushing (with vacuum trucks) and removing blockages due to sedimentation from failed filters. These are highly recommended for large and small tank systems.

### INSPECTION / MAINTENANCE PORTS DETAIL





## STEP 6 A: WRAP TANK IN GEOTEXTILE



Wrap Geotextile placed in Step 3, over the Flo-Tank® modules.

Seal all the seams and joins of the geotextile using duct tape. There should be a minimum of 300mm (12") overlap at the joins and seams.

Sealing the system insures that backfill materials are kept out of the system.

Put utility tape on all corners of the tank to determine sub-surface location in the future.

## RAINWATER & O.S.D TANKS ONLY

### STEP 6 B: SEAL SYSTEM WITH LINER



Constructed tank is wrapped in geotextile.

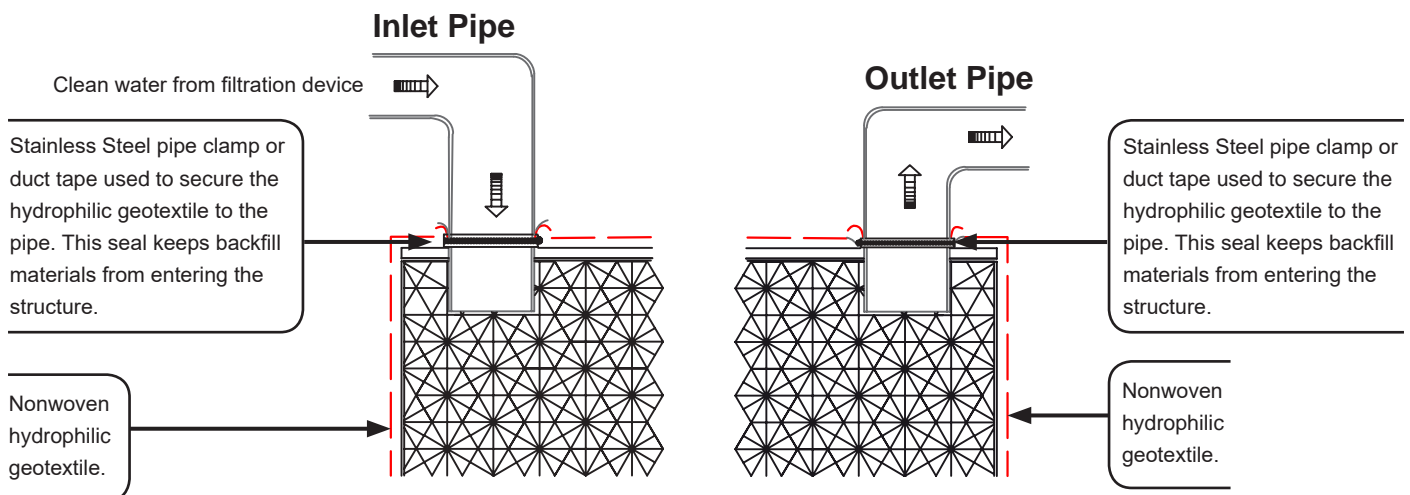


Liner is pulled up over the constructed tank.

## STEP 7 A: Connect Inlet / Outlet Pipes

**IMPORTANT: All water entering the Atlantis system must be filtered by an approved filtration device. Raw stormwater containing gross pollutants and heavy sediments must be kept out of the Atlantis system.**

### Typical Pipe Inlet Outlet Connection



Wherever a pipe must pass through the geotextile, cut an “X” in the geotextile, pull the four flaps back over the pipe. Use duct tape to seal around the pipe, then attach stainless steel clamp to securely fasten the connection.



**NOTE: Flo-Tank® tank systems should not be activated or brought on-line until construction is completed and the site is stabilized. This will prevent construction debris and heavy sediments from contaminating the system.**



## STEP 8: Backfill Sides

NOTE: **Compact back fill layers in 150mm (6") lifts.**

Side backfill must consist of clean washed sand free from silt and clays. Backfill materials containing clay should NEVER be used.

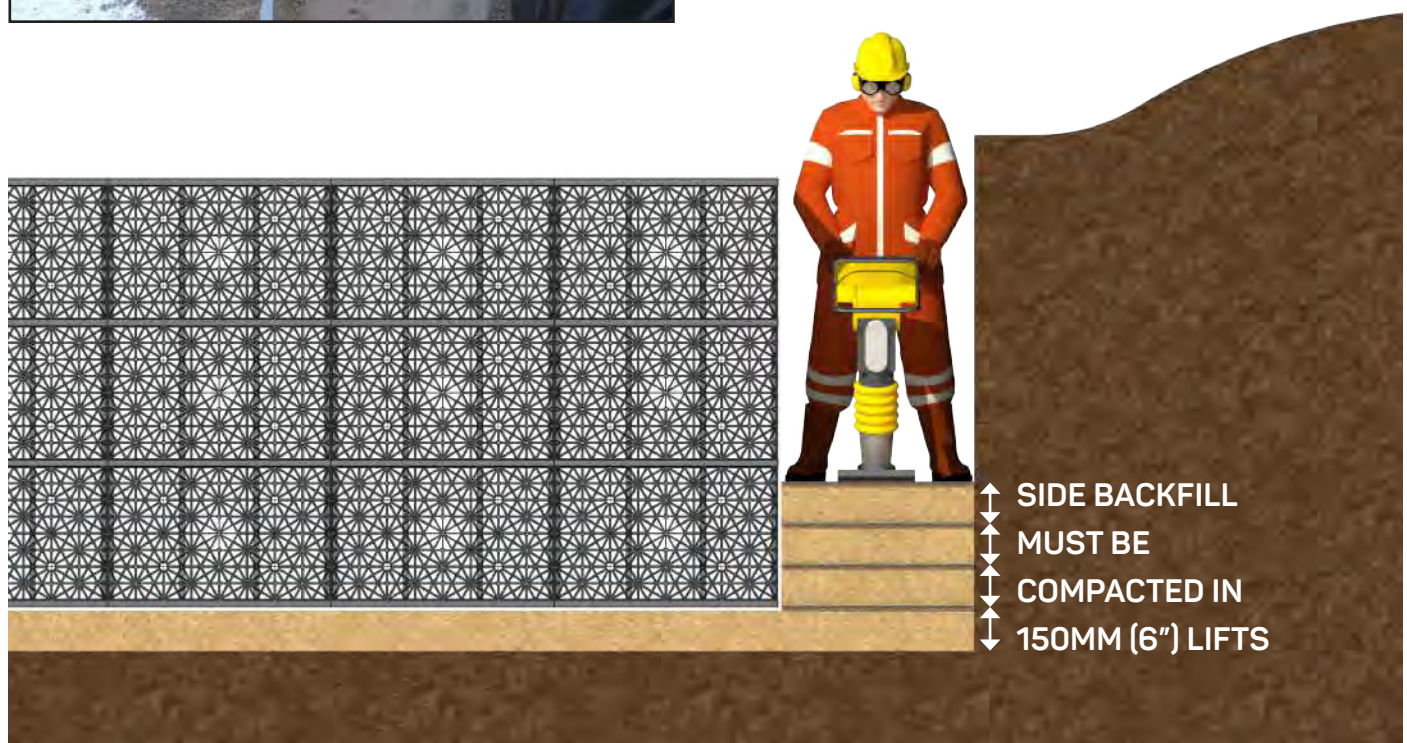
Compact side fill in 150mm (6") lifts and compact to 95% proctor density. Each compacted lift must be constructed on all sides of the tank structure before the next lift can be constructed. Use a powered mechanical compactor to compact the lifts.



When using a mechanical compactor cover the side of the tank system with a sheet of plywood to protect the fabric and tank modules from damage. Move the plywood sheet as the compactor moves.

Side backfill can range in width from 200mm (10") to 500mm (20") for standard applications. If you have a minimal footprint and have to limit your side fill please contact our technical department for directions.

For installations into reactive soils or clay a minimum of 500mm (20") side backfill is required.



## STEP 9: Backfill Top

### MINIMUM TOP COVER REQUIRED

Pedestrian Traffic 300-500mm (12"-20")

Vehicular Traffic 600-1000mm (24"-40") including any road base and surfacing materials

**MINIMUM BACKFILL UNDER CONCRETE SLAB for lightweight traffic load:** A minimum of 100mm of top backfill can be applied when specified under a 150mm reinforced concrete slab. Seek approval from a structural engineer.

**MAXIMUM BACKFILL:** If backfill exceeds 2 meters contact Atlantis Technical Department.



When placing backfill materials be careful to avoid damage or displacement of the tanks and geotextile fabric. Excavator equipment shall remain clear of the excavation. Material shall not be dropped vertically on the tank from a distance greater than one-foot.

Exercise care when placing the first 150mm (6") lift on the tank structure. The next 150mm (6") lift may be placed using lightweight vehicle with tracks. Place at least 500mm (20") of material and blade down to 300mm (12"), where required, then compact to 95%.



**NOTE: NO VEHICLES** are to drive directly over the tank modules unless the initial 150mm (6") compacted layer of backfill material has been laid.

**\*CONTACT ATLANTIS FOR MAXIMUM ALLOWABLE CONSTRUCTION LOADS**



\* For large scale projects, spread the backfill material with a low ground pressure skid steer loader (i.e. Posi Track)



## STEP 10: Place Geogrid (optional)



Geogrid is required for load-bearing applications such as systems placed below parking lots.

Geogrid should be BX-1200 or equal and should extend 1m (3ft.) beyond the excavation footprint.

Overlap all edges by 500mm (20") or as recommended by manufacturer or engineer. Continue backfilling to recommended levels in 150-300mm (6"-12") lifts with compaction to 95%.

## STEP 11 - Site Final Cleaning

Perform final cleaning of work and remove all excess material, debris and equipment. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

## STEP 12 - Surface Materials

Place surfacing materials such as ground covers, shrubs or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.

## STEP 13 - Erect Perimeter Fencing



Following completion of the work, mark the perimeter of the system footprint and place temporary fencing to restrict heavy traffic or impact above the system until construction of the site is complete.

## STEP 14 - Permanent Perimeter

When necessary install permanent signs that display warnings of maximum loads allowable over the tank installation. Permanent bollards (traffic post) can also be installed to prevent any traffic from entering the tank location.

## STEP 15 - System Commissioning / Bringing the System Online

Direct all site stormwater runoff away from the installation area during construction. The installation area shall not receive any run off. To maintain the area provide temporary erosion control devices and landscaping that minimizes the entry of silts and clay into the infiltration installation area.



## **For Rainwater Harvesting & O.S.D Detention Tanks ONLY**

### Step 7 B: Installation of Pipe Boot to Liner

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#### **Liner Preparation**

When installing pipe boots it is important that the liner is flat against the modules without creases or wrinkles and the surface is clean and dry. The liner should now be secured against the crates in its final location.

#### **Determine Position of Pipe and Cut Out Hole In Liner**

With the pipe in place, carefully cut the liner around the pipe and remove the section of liner.

#### **Prepare Final Position of Pipe**

Slide the pipe boot over the pipe, then position pipe at its final location and fix into place with compacted backfill. It is important that the pipe does not move after the pipe boot is bonded to the liner as this movement may break the seal or damage the pipe boot causing failure.

#### **Mark Flange Position**

Slide the flange of the pipe boot against the liner, then mark the liner around the flange with a felt tip marker.

#### **Primer Application**

Slide the pipe boot back along the pipe out of the way. Then, with the application pad supplied, apply a good thick bead of primer 100mm (4") wide around the inside of the line. Overlap the line by about 10mm (0.4") Even out the primer with the pad as much as possible so there is a uniform thickness. Allow the primer to flash off till touch dry. This should be less than 10 minutes depending on the ambient temperature.

#### **Position Flange**

When the primer is touch dry slide the pipe boot back into place lining up the edge with the primer. Carefully remove the backing paper from one edge of the flange then push the flange against the primer making sure that there are no wrinkles in the liner or flange.

#### **Install Flange**

Tightly rub the back of the flange making sure that all of the flange is bonded to the liner. It may be a good idea to install a thin sheet of plywood or similar substance between the crates and the liner to give a firm backing. Repeat this process for the other 3 sides of the pipe boot flange always making sure that there are no wrinkles or folds in the liner or pipe boot flange. Give the flange a good firm rub making sure that there are no bubbles in the bond and that the flange is firmly bonded to the liner. Remove the plywood.

#### **Apply Sealant to Flange**

With the tube of sealant supplied, apply a bead of sealant around the outside of the flange about 15mm (0.6") wide.

#### **Sealing the Pipe Boot to the Pipe**

Put a bead of sealant between the pipe boot and the pipe then apply a stainless steel pipe band around the pipe boot and pipe.

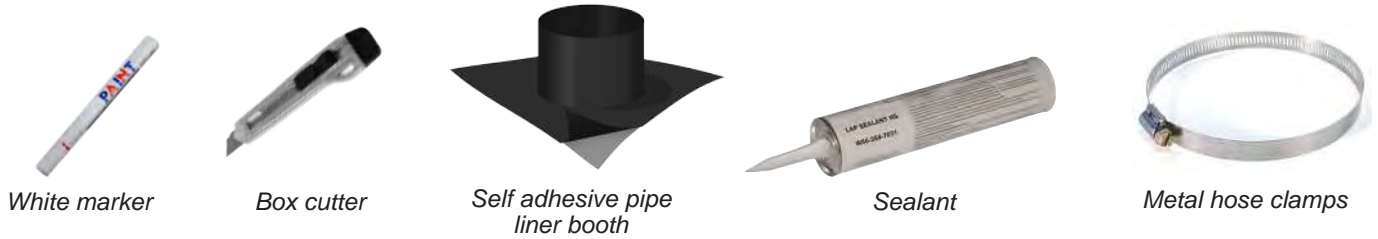
#### **Wrap Protective Layer of Duct Tape Around Pipe Clamp**

To protect the pipe boot from the sharp edges of the pipe clamp it is a good idea to run a couple of layers of duct tape around the pipe boot prior to installing the pipe clamp.

## Self Adhesive Pipe Boot Instructions page

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### Materials needed



**1.** Clean the area where the boot is to be installed



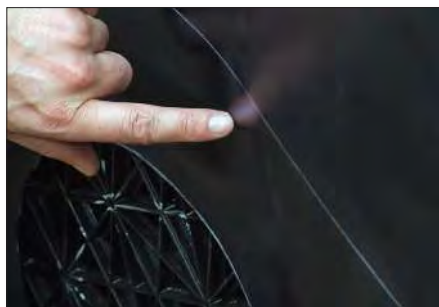
**2.** Trace the edge of the boot onto the tank liner



**3.** Cut the opening for the pipe



**4.** Prepare the area of the boot flange with a polypropylene glue



**5.** The area is ready when the surface is dry to the touch



**6.** Peel the back corner of the flange to expose the sticky side



**7.** Mount the boot liner starting from the corner.



**8.** Insert the pipe and push all the way against the tank



**9.** Apply the sealant between the liner and the PVC pipe.



**10.** Move the clamp over and around the boot and tighten

## DESIGN CHECKLIST

The following checklist is strictly for the use of a certified engineer who has been given the authority to design for the project in which the tanks will be used.

### Atlantis system specified:

Infiltration

Harvesting (Reuse).

*Impermeable liner required*

On Site Detention (OSD)

*Impermeable liner required*

|            |   | YES                      | NO                       |
|------------|---|--------------------------|--------------------------|
| <b>1.</b>  | <b>Have Project Drawings and a Geo-technical Report been provided?</b><br><br>If NO: Please contact an engineering consulting firm to obtain a geotechnical report and relevant project sections, and then continue completing the rest of the form.  | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>2.</b>  | <b>Have expected loads been incorporated into the design?</b><br>Vertical Dead Load: _____ kPa / _____ psi<br>Vertical Live Load: _____ kPa / _____ psi<br>Vertical Combination /<br>Uniformly distributed loads (UDL): _____ kPa / _____ psi<br>Lateral Load: _____ kPa / _____ psi<br>Uplift Load: _____ kPa / _____ psi<br>Diagonal Load: _____ kN / _____ lb<br><br><small>*According to AS4678, AS1170.1, AS 2566.1, AS 5100, AUSTRROADS, BS EN 1997-1:2004 and CIRIA C680</small> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>3.</b>  | <b>Have the following requirements been considered?</b><br>Top Cover/backfill: _____ m / _____ (ft)<br>Setback / Adjacent structure at: _____ m / _____ (ft)<br><br><small>*Please review minimum top cover according to AS2566.1 and AS3500 and minimum setback according to Engineers Australia (2003-2006) in Atlantis technical specification</small>   | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>4.</b>  | <b>Is there presence of high water table?</b><br>If YES: please specify distance from level _____ m / _____ (ft)  | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>5.</b>  | <b>Are there any nearby hills or steep slopes?</b><br>If YES: How far from the tank perimeter? _____ m / _____ (ft)<br>What is the slope gradient? _____<br><br><small>*Please note that the coefficient of earth pressure may be greater in presence of nearby hills. Atlantis does not recommend tank installations near hills or steep slopes.</small>   | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>6.</b>  | <b>Main soil type present on the site, identified in geotechnical report?</b><br>Soil type: <input type="checkbox"/> Coarse sand <input type="checkbox"/> Sandy loam <input type="checkbox"/> Sandy clay <input type="checkbox"/> Clay <input type="checkbox"/> Other: _____<br>_____   | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>6.1</b> | <b>Is there presence of soft soils (such as clay) and/or the tank will be used as a foundation system?</b><br><br>If YES: Please check settlements and bearing capacity of soils.   | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>7.</b>  | <b>Design Life of the project:</b> <input type="checkbox"/> 20 years <input type="checkbox"/> 30 years <input type="checkbox"/> Other: _____  |                          |                          |
| <b>7.1</b> | <b>Has a creep reduction factor been taken into account for compressive strength capacity?</b><br><br><small>* According to AS4678</small>  | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>7.2</b> | <b>Is the tank height greater than 2m (6.5 ft)?</b><br><br>If YES : Contact Atlantis Technical Department   | <input type="checkbox"/> | <input type="checkbox"/> |

|     |  | YES                      | NO                       |
|-----|--|--------------------------|--------------------------|
| 8.  | <p><b>Pre-treatment/filtration system:</b></p> <p><input type="checkbox"/> Atlantis Large / Small Filter</p> <p><input type="checkbox"/> Gross Pollutant Trap (GPT)</p> <p><input type="checkbox"/> Biofiltration</p> <p><input type="checkbox"/> Other: _____</p> <p><b>If NO:</b> The end-user is responsible for the performance of the tanks if there is not a pre-filtration system installed/specified.</p> <p><b>Note:</b> Sediments, debris and contaminants must be kept out of the system.</p> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.  | <p><b>Backfill material specified?</b></p> <p><input type="checkbox"/> Washed sand (less than 5% fines passing 75 micron sieve)</p> <p><input type="checkbox"/> Aggregate of angular material (up to 19mm - 3/4")</p> <p><input type="checkbox"/> Other: _____<br/>(Material graded to AS 1141)</p> <p><b>If NO:</b> Please seek approval from a geotechnical/structural engineer as to what backfill should be used.</p>  | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. | <b>Is the strength capacity of the tank greater than the loads applied on it?</b>  | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. | <b>Project was consulted upon and approved by qualified engineers</b>  | <input type="checkbox"/> | <input type="checkbox"/> |

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Designer: \_\_\_\_\_ Signature: \_\_\_\_\_

## INSTALLATION CHECKLIST

Atlantis system specified:

Infiltration

Harvesting (Reuse)

On Site Detention (OSD)

*Impermeable liner required  
Always include section 4*

*Impermeable liner required  
Always include section 4*

YES NO

Does the P.O./ Batch Number match the designed load specified by the authorized engineer?

### 1. EXCAVATION

**Note:** Please ensure a temporary perimeter fence is erected before excavation.

YES NO

a. Is the base compacted and leveled?

*If NO: Correct unsatisfactory conditions before commencement of base preparation layer.*

d. Are contaminated/acid soils and/or filling present? Is the site a landfill?

*If YES: Design must be approved by an authorised qualified engineer*

c. Are clay/soft/muddy soils and/or high water table present?

*If YES: Design must be approved by an authorised structural engineer*

### 2. GROUND FOUNDATION - BASE PREPARATION

YES NO

a. Does the foundation of the excavation have a minimum CBR of 3-5% in accordance with AS 1289.6.1.1?

*If NO: Design must be approved by an authorised structural engineer*

b. Is the base layer minimum meeting authorised engineer's depth requirements?

c. Is the base well compacted according to AS 1289.5 and the site graded?

### 3. GEOTEXTILE USE

YES NO

a. Is your geotextile hydrophilic?

*If NO: Ensure the geotextile is hydrophilic*

b. Is there enough overlap available to fold over the top of the tank?

*If NO: Ensure an overlap by a minimum of 300mm (12")*

### 4. OSD & REUSE INSTALLATION

YES NO

a. Is there enough overlap for the impermeable liner?

*If NO: Ensure overlap is available to fold over the top of the tank. Minimum overlap of 1m (3 ft.)*

b. Is there a geotextile layer to protect the liner?

*If NO: Ensure a geotextile/sand protection layer*

**Note:** Please consider the use of an extra strip of geotextile on the corners to protect the liner.

### 5. INSTALLING ATLANTIS MODULES

YES NO

a. Are string lines around the boundaries to ensure straight lines

*If NO: Ensure the tanks are aligned according to original design*

**Note:** Best practices recommend that boundaries of the tank should be carried out by surveyors to ensure a straight installation.

b. Are the modules stacked firmly against each other?

*If NO: Gaps should not be greater than 5mm (1/4").*



## INSTALLATION CHECKLIST (Continued)

### 6. INSTALLING MAINTENANCE PORTS

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| <b>a. Inspection/Vent/Flushing Ports</b><br>If NO: Atlantis tanks must be vented to prevent vacuum effect and may require specific maintenance according to the authorised engineer | <input type="checkbox"/> | <input type="checkbox"/> |

### 7. BACKFILLS

|  | YES                      | NO                       |
|--|--------------------------|--------------------------|
| <b>a. Backfill material: Either Coarse washed sand with less than 5% fines passing 75micron sieve or Aggregate of angular material up to 19mm (3/4") or Other granular material graded to AS 1141?</b><br>If NO: Any other backfill material must be approved by the authorised engineer<br>Note: Backfill materials containing clay should never be used    | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>b. Backfill sides between 200-500mm (7.87" - 19.68")?</b><br>If YES: Compact according to AS 1289.5<br>If NO: Design must be approved by a structural engineer.<br>Note: When backfilling and compacting, make sure that you do not pinch the liner or rub the compactor against the liner. Protect it with a plywood sheet 20mm (0.8") thick             | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>c. Is the top backfill meeting Australian Standards (or local standards) minimum cover requirements and not exceeding 1600mm (5.3ft)?</b><br>If YES: Compact according to AS 1289.5<br>If NO: Structural engineers' approval needed.<br>Note: Ensure an equally distributed load light vehicle (i.e. Posi Track) is used to spread and level top backfill | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>d. Placing and handling the backfill material: Is the backfill material placed alongside the excavation line around the tank?</b>   | <input type="checkbox"/> | <input type="checkbox"/> |

### 8. GEOGRID (Optional)

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| If YES: Ensure a minimum Overlap of 1m (3ft)<br>Note: Tensar BX 1200 or similar | <input type="checkbox"/> | <input type="checkbox"/> |

### 9. PIPING

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| <b>Are pipes no greater than 225mm (9")?</b><br>Inlet: _____ mm / ( _____ ")<br>Outlet: _____ mm / ( _____ ")<br>Overflow: _____ mm / ( _____ ")<br>Other: _____ mm / ( _____ ")<br>If YES: Installed according to Atlantis installation guidelines<br>If NO: Ensure pipes greater than 225mm (9") do not penetrate the Tank structure.<br>Note: Overflow according to AS3500.1 | <input type="checkbox"/> | <input type="checkbox"/> |

## INSTALLATION CHECKLIST (Continued)

### 10. PROJECT DOCUMENTS

|  | YES                      | NO                       |
|--|--------------------------|--------------------------|
| Maintenance manual provided to the end user? | <input type="checkbox"/> | <input type="checkbox"/> |
| Handover Document provided to the end user?  | <input type="checkbox"/> | <input type="checkbox"/> |

### 11. SITE FINAL CLEANING

|                             | YES                      | NO                       |
|-----------------------------|--------------------------|--------------------------|
| Has cleaning been arranged? | <input type="checkbox"/> | <input type="checkbox"/> |

### 12. PERMANENT PERIMETER

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| <b>a.</b> Did you install signage to prevent any traffic from entering the location?<br><i>If NO: Ensure a signage is present</i> | <input type="checkbox"/> | <input type="checkbox"/> |

### COMMENTS (For quality and training purposes)

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| After the excavation: _____<br>Size / cross section / design matches the site<br>Other: _____<br>_____<br>_____ | <input type="checkbox"/> | <input type="checkbox"/> |

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Designer: \_\_\_\_\_ Signature: \_\_\_\_\_

**Note:** Atlantis products are manufactured by independent factories from high quality recycled materials, carefully selected and under strict quality control procedures. The strength could vary slightly due to raw material, country of manufacture, manufacturing process and external conditions.

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## END USER CHECKLIST

**NOTE: The tank is solely used for its purpose to temporarily detain or permanently store potable or treated stormwater**

### MAINTENANCE GUIDANCE OF PRE-TREATMENT/FILTRATION SYSTEMS

|    |   |  |
|----|---|--|
| 1. | <p><b>Monthly/after significant storm events</b></p> <ul style="list-style-type: none"> <li>a. No clogging at inlet/outlet structures/trash racks</li> <li>b. Clean when there is excessive sediment build up in the pre-treatment device</li> <li>c. Inspect, lubricate and conduct routine test to check reliability of pump(s)</li> <li>d. Check condition and conduct function test of all pump starters and their controls including level control systems</li> <li>e. No obstruction of maintenance access/openings</li> <li>f. Access into the tank system is secure (out of bounds to public and unauthorised personnel)</li> </ul> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> |
| 2. | <p><b>Yearly as required</b></p> <ul style="list-style-type: none"> <li>g. De-silting of the tank has been carried out, trash screens have been cleaned</li> <li>h. Inspect, service, replace, lubricate and test performance of pump(s)</li> <li>i. Check condition and conduct function test of all pump starters and controls including level control systems.</li> <li>j. Replace faulty and worn out parts if required.</li> </ul>   | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |

### INSTALL PERMANENT SIGNAGE

Signage Should Read:

CAUTION:

UNDERGROUND STORMWATER TANK BELOW *Underlining maximum vehicle loads*

# **Flo-Tank<sup>®</sup>**

## **MODULAR UNDERGROUND TANK SYSTEM**



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