

## Atlantis Matrix D-RainTank® Installation Specifications

### Technical Specification:

#### PART 1 - GENERAL

##### 1.01 General Provisions

- A. The Conditions of the Contract and all Sections of Division 1 are hereby made a part of this Section.

##### 1.02 Description of Work

- A. Work Included:
  - 1. Provide excavation and base preparation per Geotechnical Engineer's recommendations and/or as shown on drawings, to provide adequate support for project design loads and safety from excavation sidewall collapse. See 2.02 Materials.
  - 2. Provide Atlantis Matrix D-RainTank® Modular system products including RainTank Module, geotextiles, geogrids, inlet and outlet pipe with connections and installation per the manufacturer's instructions furnished under this section.
- B. Related Work:
  - 1. Subgrade excavation and preparation under Section 02300 - Earthwork.
  - 2. Subsurface drainage materials - Section 02700 - Subsurface Drainage and Structures, as needed.

##### 1.03 Quality Assurance

- A. Follow Section 01340 requirements.
- B. Installation: Performed only by skilled work people with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/landfill construction projects of comparable size and quality.

##### 1.04 Submittals

- A. Submit manufacturer's product data and installation instructions.
- B. Submit Atlantis Matrix D-RainTank Module® product for review. Reviewed and accepted samples will be returned to the Contractor.
- C. Submit material certificates for geotextile, geogrid, base course and backfill materials.

##### 1.05 Delivery, Storage, and Handling

- A. Protect Atlantis Matrix D-RainTank Modules® from damage during delivery and store under tarp to protect from sunlight when time from delivery to installation exceeds one week. Storage should occur on smooth surfaces, free from dirt, mud and debris.
- B. Handling is to be performed with equipment appropriate to the size (height) of cells and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.

##### 1.06 Project Conditions

- A. Review installation procedures and coordinate RainTank installation with other work affected, such as grading, excavation, utilities, construction access and erosion control to prevent all non-installation related construction traffic over the completed Matrix D-RainTank Module installation, especially with loads greater than design loads.

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- B. Cold weather:
  1. Do not use frozen materials or materials mixed or coated with ice or frost.
  2. Do not build on frozen ground or wet, saturated or muddy subgrade.
  3. Care must be taken when handling Atlantis Matrix D-RainTank Modules® when air temperature is at 40 degrees or below as plastic becomes brittle.
- C. Protect partially completed RainTank installation against damage from other construction traffic when work is in progress and following completion of backfill by establishing a perimeter with highly visible construction tape, fencing, or other means until construction is complete.
- D. Protect adjacent work from damage during RainTank installation.

## PART 2 - PRODUCTS

### 2.01 Availability

- A. The underground storage system must be modular in nature, fit into the footprint of the specified system, and have a minimum of 5 years of use in the United States with a minimum of 1 million cubic feet installed and performing.
- B. Approved Manufacturer: Atlantis Corporation Pty Ltd, Unit 3, 19-21 Gibbes Street, Chatswood, NSW -2067 Australia. (T) +61 02-9419 6000. (Fax) +61 02-9419 6710  
Distributor: ACF Environmental, 2831 Cardwell Road, Richmond, VA 23234; 800-448-3636; Fax 804-743-7779; e-mail [sales@acfenvironmental.com](mailto:sales@acfenvironmental.com); Website [www.acfenvironmental.com](http://www.acfenvironmental.com)

### 2.02 Materials

- A. Base of Excavation: Shall be smooth, level and free of lumps or debris. Compact to at least 95% or as required by Engineer. Structural fill material and/or geogrid may be used to amend the structural capacity of the soil. A thin layer (3") of material (See Section D) is recommended to establish a level working platform.
- B. Geotextile: Most applications require SI 801 or equivalent nonwoven geotextile with a nominal weight of 8 oz per square yard. Applications requiring water to infiltrate/exfiltrate through the geotextile as a primary mode of introducing or removing water from the RainTank should use a woven monofilament such as SI 111F. Geotextile should be appropriate for the soil type and depth, and be placed on the floor of the excavation, the sides of the module, and top of the module.
- C. Atlantis Matrix D-RainTank Module®: Injection moulded plastic units 408mm x 685 mm x 20mm (16.06" x 26.97" x 0.78") and 408mm x 430mm x 20mm (16.06" x 16.92" x 0.78"). Plates can be pre-assembled and shipped to the site or assembled on site to make the modules. They can also be assembled into multiple stacked modules in vertical cell structures of variable height (17.2", 34.65", 51.57", 68.5", or 85.43" as required), volume=5% solid. Note that when placing cells into the excavated area, the tank should be installed as per detail for maximum strength.
- D. Side Backfill: Structural fill, sand or other free-draining materials compactable to 95%, free from lumps and debris or any other sharp materials to backfill along the sides of the cellular structure. Must be compacted with powered mechanical compactor in lifts that do not exceed 12" to provide a settlement-free surface over the top and sides of the structure.
- E. Top Backfill: Use Side Backfill material for first 12" above the RainTank. Top backfill should be between 12"(300mm) minimum and 36" (500mm) maximum depth compacted in 6" lifts. To support H20 loads, top cover should be 18" minimum depth (24" recommended), reinforced with a geogrid 12" above the RainTank. Material above the geogrid may vary based on the intended use of the surface area. In no case should clays be used to backfill the RainTank.

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- F. Geogrid: Use Tensar BX-1200 or equivalent to reinforce backfill above RainTanks to support H2O loads (otherwise, not required). Geogrid should extend 3 feet beyond the excavation footprint.
- G. Utility Marker: Use metallic tape at corners of install to mark the area for future utility detection.

PART 3 - EXECUTION

3.01 Inspection

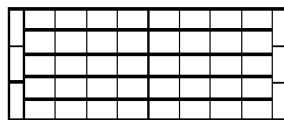
- A. Examine prepared excavation for smoothness, compaction and level. Do not start installation of Atlantis Matrix® D-RainTank until unsatisfactory conditions are corrected. Check for presence of high water table, which must be kept at levels below the bottom of the RainTank structure at all times.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Project Manager for resolution.

3.02 Preparation

- A. Using Side Backfill Material (Section 2.02 D) level the base of the excavated area as per engineering detail to establish a working platform for the RainTanks.
- B. It is helpful to identify the outline of the structure on the floor of the excavation, using spray paint or chalk line, to ensure squareness during module placement.

3.03 Installation of Atlantis Matrix D-RainTank Module®:

- A. If a liner is being used in the system to harvest stormwater or prevent groundwater intrusion, install per manufacturers recommendations and per engineering detail.
- B. Lay geotextile on the base of the excavation and sidewalls with extra material on side to wrap the tank modules from the top. If engineering drawings do not require geotextile on the base of the excavation, place fabric a minimum of 20" (500mm) inside the outer perimeter of the RainTank footprint.
- C. Install Atlantis Matrix D-RainTank Modules® by placing units side-by-side. Whenever possible, the large side plate of the tank should be placed on the perimeter of the system. This will typically require that the two ends of the tank area will have a row of tanks placed perpendicular to all other tanks.



- D. Wrap the Tank modules in geotextile fabric from the sides and the top to prevent soil entry into the RainTank modules. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to (optional) liner during placement.
- E. Identify locations of inlet, outlet, inspection ports, and any other penetrations of the geotextile and (optional) liner, securing pipe into boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent damage to geotextile, (optional) liner or pipe.
- F. Start backfilling with recommended backfill, compacting in 12" maximum lifts. Place backfill CAREFULLY to avoid shoving or damaging tanks. Use a powered mechanical compactor to compact backfill on structure sides with care to avoid damage to geotextile or (optional) liner.
- G. With modules greater than 1.2 meters (4 feet) deep, place piles of cover material on top of the enclosed system's outer edge to provide vertical load on perimeter modules. This

will ensure compression of the top of the system and aid in resistance to side pressures from backfill operations. Backfill above system should be compacted in 6" lifts. When backfill reaches an elevation 12" above the RainTank units, place a layer of geogrid directly over the top of the backfill (required only when there will be traffic loads (H2O loads) above the tanks), extending 3' beyond the excavation walls.

- H. Place sufficient sandy gravel backfill (Section 2.02 E) material over geogrid to ensure support of design loads. Place cover backfill in 6" lifts and compact with vibrating plates or walk-behind rollers (do not use drivable rolling compactors) to a minimum of 95%, with a minimum depth of 6" (12" is recommended) and a maximum depth of 36" or as specified on engineering drawings. Take care to PLACE backfill on top of structure to avoid damage to structure, geotextile or (optional) liner, using low pressure tire or track vehicles.
- I. Ensure that all unrelated construction traffic be kept away from the limits of excavation until the project is complete and final surface materials are in place.
- J. Place surfacing materials, such as groundcovers (no shrubs or trees), or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.

#### 3.04 Cleaning

- A. Perform cleaning during the installation of work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

### PART 4 - USING THE SYSTEM

#### 4.01 Maintenance Requirements

- A. Maintenance efforts should be focused on pretreatment systems. Ensuring these structures are clean and functioning properly will prevent contamination of the RainTank system and stormwater released from the site. Pre-treatment systems should be Inspected as directed by the manufacturer (for proprietary systems) or at least quarterly for the first year of use, yearly thereafter. Maintain as needed using acceptable practices or following manufacturer's guidelines (for proprietary systems).
- B. If the RainTank system included Inspection or Maintenance Ports, it will be necessary to inspect the system for accumulation of sediments. This is done by removing the cap of the port and using a measuring device long enough to reach the bottom of the RainTank and stiff enough to push through the loose sediments, allowing a depth measurement.
- C. If sediment has accumulated beyond an acceptable level, it will be necessary to flush the RainTank. This can be done by pumping water into the Maintenance Port or adjacent structure, allowing the turbulent flows through the RainTank to re-suspend the fine sediments. If multiple Maintenance Ports have been installed, water should be pumped into each port to maximize flushing efficiency. Sediment-laden water can be pumped out and either captured for disposal or filtered through a Dirtbag™ if permitted by the locality.

END OF SECTION