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## STORMWATER MANAGEMENT





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R-Tank stormwater systems provide underground storage of stormwater. After a rain event fills the R-Tank, stormwater can flow into the drainage system, infiltrate into the ground, or be reused. The system is an alternative to stormwater basins and a more efficient, space saving alternative to other underground systems for detention, infiltration, and recycling stormwater.



R-Tank is a modular system and can be assembled to a variety of heights from 2" to just under 7'. This rigid system can be placed beneath a variety of surfaces including: Parking Lots, Streets and Access Roads, Driveways, Landscaping, Athletic Fields/Playgrounds, Swales and Channels.

R-Tank can be used for a variety of applications including: Retention and Infiltration, Detention, Recycling / Harvesting or Pond Retrofits, Dry Wells, and Bioretention.

With an unlimited array of possible design configurations, the R-Tank can adapt to your project to make the most economical systems possible. Strength. Versatility. Cost-Effectiveness. And we're just getting started!

# R-TANK

## BENEFITS

### High Capacity

- 95% void internal area

### Strength

- Easily supports traffic loading from parking lots and roads
- Backfill with sand - no stone required

### Design & Construction Versatility

- Combine modules into any shape to efficiently use space
- Vary height from 2 inches to 7 feet

### Increased Infiltration and Exfiltration

- Outer shell is 90% open
- Increases groundwater recharge, reducing post-construction discharge volumes

### Easy to Transport

- Can be supplied unassembled for reduced delivery costs

### Lightweight and Quick to Install

- Installed by hand; no cranes required
- Reduces site access delays

### Permanent and Maintainable Storage Volume

- All storage volume is isolated inside filter fabric envelope
- No reliance upon unsustainable, temporary, assumed void space in crushed gravel backfill

### Recycled Content

- Manufactured with recycled polypropylene



- Light Duty module (30 psi)
- Ideal for applications in green space
- Four internal plates
- 12" - 36" cover



- Heavy Duty module (33.4 psi)
- Standard module for HS-20 traffic application
- Five internal plates
- 18" - 84" cover



- Super Duty module (42.9 psi)
- Higher safety factors for shallow traffic applications and deeper cover
- Five internal plates
- 120" maximum cover



- Extreme Duty module (320 psi)
- Traffic loads with 6" cover or 16.5' maximum cover
- Available from 2" - 10'
- 92% void

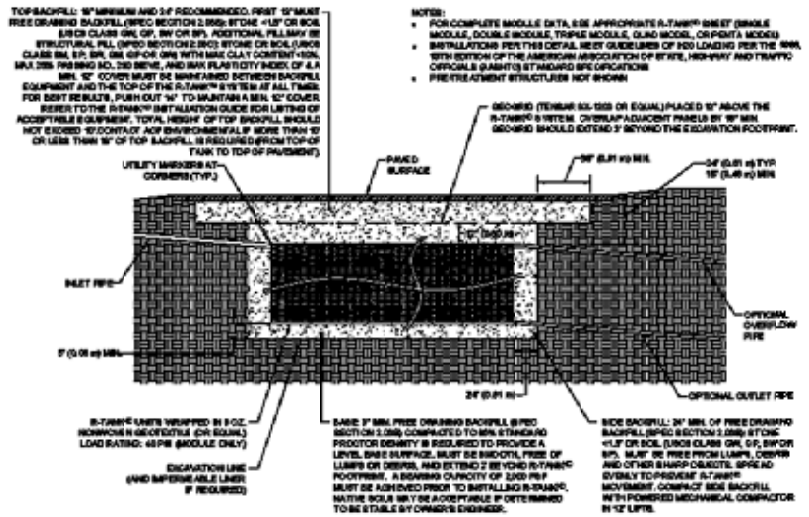




# DESIGN CONSIDERATIONS

Many factors will influence the design of the R-Tank system. While this list is not intended to be all-inclusive, several design considerations are worth highlighting:

1. PRE-TREATMENT
2. BACKFILL MATERIALS
3. RUNOFF REDUCTION
4. WATER TABLE
5. CONSTRUCTION LOADS
6. LATERAL LOADS
7. R-TANK MODULES
8. LOAD MODELING



## 1. PRE-TREATMENT

Removing pollutants from runoff before they enter an underground detention system is the only smart way to design & build a system. The best way to do that is with the Trash Guard Plus (see page 6), but many other ways exist. Be sure the system you select will remove:

- Heavy Sediments
- Gross Pollutants (trash)
- Biodegradable Debris

## 2. BACKFILL MATERIALS

Backfill materials should be stone (smaller than 1.5" in diameter) or soil (GW, GP SW or SP as classified by the Unified Soil Classification System). Material must be free from lumps, debris and any sharp objects that could cut the geotextile. See the R-Tank narrative specification section 2.03B for additional information.

## 3. RUNOFF REDUCTION

Runoff Reduction – Most designs incorporate an outlet to drain the system at a controlled rate and/or an overflow to prevent flooding in extreme events. But be sure to take advantage of any infiltration you can achieve on the site. Consider raising the invert of your outlet or creating a sump to capture and infiltrate the water quality volume whenever possible.

## 4. WATER TABLE

While installing the R-Tank below the water table is manageable, designers must be able to create a stable base and account for the system's ability to drain this water out or limit its ability to enter the system. If a liner is used to prevent ground water from entering the system, measures must be taken to prevent the system from floating.

## 5. CONSTRUCTION LOADS

Construction loads are often the heaviest loads the system will see throughout its life. Care must be taken during backfilling and compaction using the proper equipment (see specification section 3.05), and post-installation construction traffic should be routed around the system (Installation Guide step 12).

## 6. LATERAL LOADS

As systems get deeper, the loads acting on the side of the tank increase. These lateral loads should be considered when the bottom of the system is 10' or more below finished grade.

## 7. R-TANK MODULES

Be sure to select the right module for your application. See the information on page 3 for more details on which module is the best fit. Also refer to the specifications for each module on the back of this brochure or call us for assistance.

## 8. LOAD MODELING

A safety factor of 1.75 or higher is required when designing with R-Tank. Be sure to run your own loading model with all requirements specific to your site. Several example models can be found in our Tech Note on loading capabilities, and minimum cover requirements for various loads can be found in the spec on the back of this brochure.

# INTEGRATED INFRASTRUCTURE



It's no secret that much of the nation's infrastructure will be rebuilt in the coming years. This reconstruction must include moving beyond traditional systems that do ONE THING very well to systems that accomplish MULTIPLE objectives. R-Tank can play a significant role in this process when used as an integrated alternative to stormwater pipe.

## BENEFITS:

### Pipes

- Moves runoff from its origination point to a discharge point
- Typically solid, preventing exfiltration
- Smooth surfaces move 100% of contents
- Round flow area concentrates flows into the center of the pipe
- Highly efficient, providing a low Manning's N (typically .010 - .013), which short-circuits time of concentration

### R-Tank

- Moves runoff from its origination point to a discharge point
- 90% open exterior encourages exfiltration
- Contoured bottom plate retains runoff and reduces outflows
- Square flow area spreads flows across the bottom, encouraging infiltration
- Highly turbulent, providing higher Manning's N (typically .025), which extends time of concentration

## PAVEDRAIN

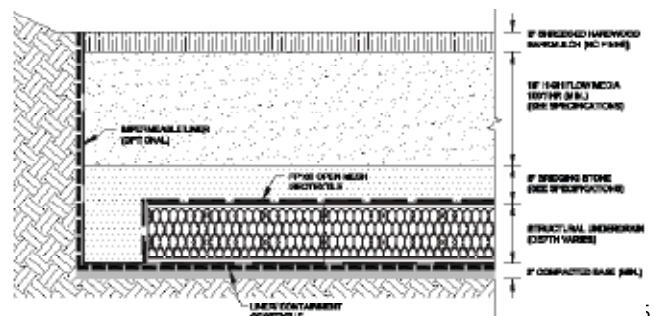
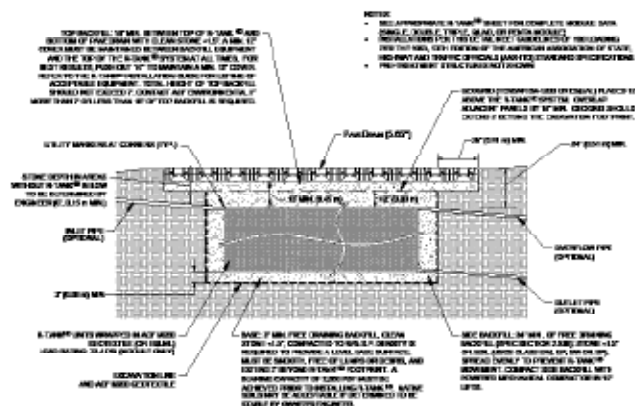
Traditional pavements move vehicles efficiently, but are easily damaged by stormwater. PaveDrain handles both traffic and stormwater with ease, making it a critical component of an integrated infrastructure plan.

- Handles all vehicular loads
- Drains ten times faster than competing pervious pavements: over 4,000 inches/hour
- Reduces long-term maintenance costs
- Provides detention volume within the block and in base materials
- Encourages infiltration
- Pair with R-Tank to maximize water storage and transport

## FOCALPOINT

Traditional landscaping adds aesthetic value to projects, but has more potential. Many developers turn to bioretention, but are forced to surrender massive land areas to accomplish modest goals. FocalPoint reduces the space requirements of bioretention by up to 90% while providing all the water purification benefits.

- Adds aesthetic value to properties
- Cleans runoff to improve water quality
- Reduces space requirements of traditional bioretention systems
- Encourages infiltration to reduce volume of water discharged
- Pair with R-Tank to maximize water storage and transport



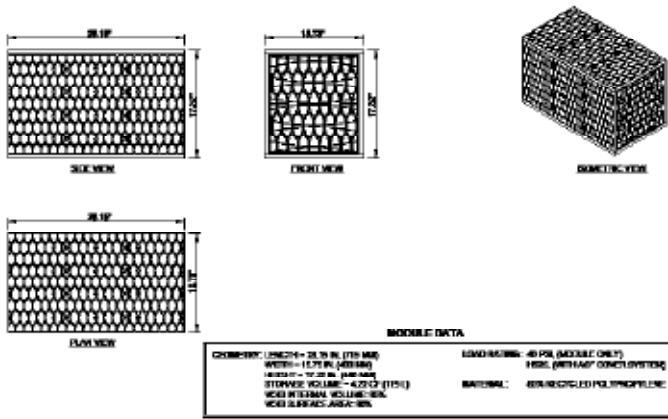




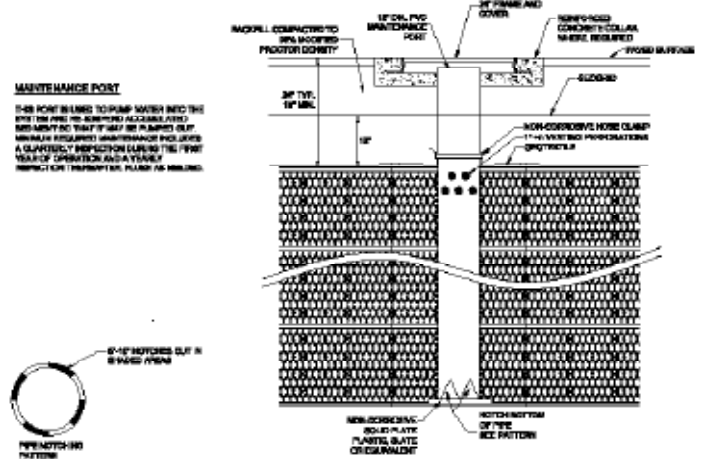
# TYPICAL DESIGN

## CAD DRAWINGS

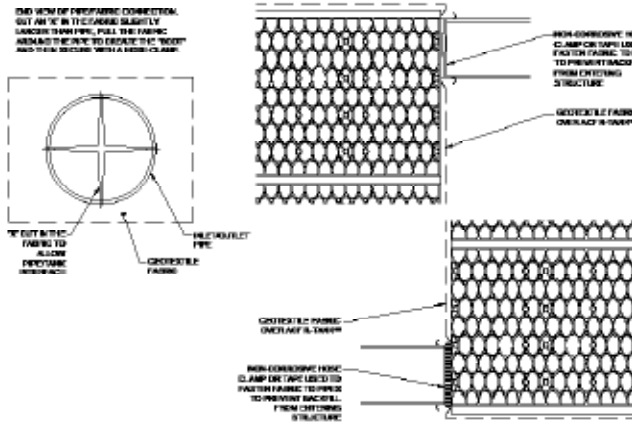
### Module Drawings - Single



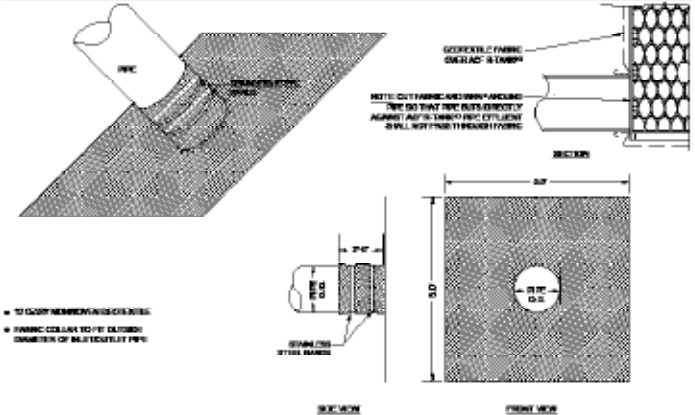
### Maintenance Port



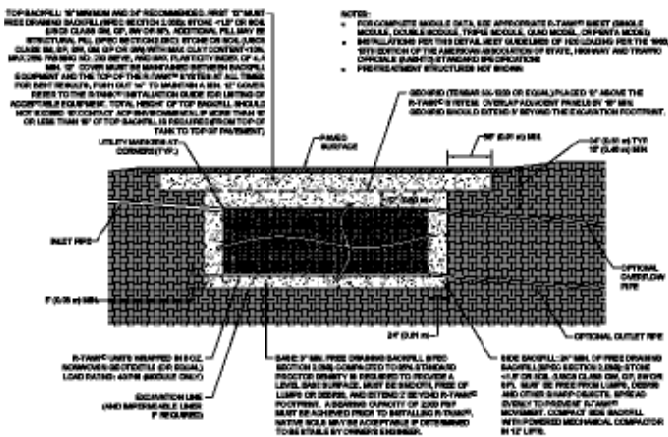
### Inlet / Outlet Pipe Connections



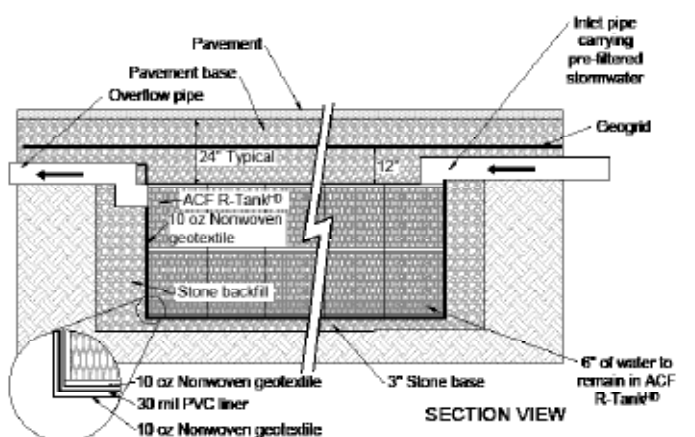
### Pipe Boot



### HS 20 Load



### Cistern



# PRODUCT SPECIFICATION



and



## Dimensions & Capacity

Module (Units)	Width (inches)	Length (inches)	Height (inches/ft)	Tank Vol (cf)	Storage Vol (cf)	Weight* (lbs)
Mini	15.75	28.15	9.45" / 0.79'	2.42	2.30	10.19 / 10.95
Single (1)	15.75	28.15	17.32" / 1.44'	4.44	4.22	15.73 / 17.35
Single + Mini (1.5)	15.75	28.15	25.98" / 2.17'	6.67	6.33	23.61 / 25.98
Double (2)	15.75	28.15	33.86" / 2.82'	8.69	8.25	29.15 / 32.37
Double + Mini (2.5)	15.75	28.15	42.52" / 3.54'	10.91	10.36	37.02 / 41.01
Triple (3)	15.75	28.15	50.39" / 4.20'	12.93	12.28	42.56 / 47.40
Triple + Mini (3.5)	15.75	28.15	59.06" / 4.92'	15.15	14.39	50.43 / 56.03
Quad (4)	15.75	28.15	66.93" / 5.58'	17.17	16.31	55.97 / 62.43
Quad + Mini (4.5)	15.75	28.15	75.59" / 6.30'	19.39	18.42	63.85 / 71.06
Pent (5)	15.75	28.15	83.46" / 6.96'	21.41	20.34	69.38 / 77.45

\* Weights Shown are for Standard R-Tank and R-Tank<sup>HD</sup>



## Dimensions & Capacity

Module (Units)	Width (inches)	Length (inches)	Height (inches/ft)	Tank Vol (cf)	Storage Vol (cf)	Weight (lbs)
Single (1)	15.75	28.15	9.45" / 0.79'	2.42	2.30	10.95
Double (2)	15.75	28.15	18.12" / 1.15'	4.64	4.41	19.58
Triple (3)	15.75	28.15	26.79" / 2.23'	6.86	6.52	28.21
Quad (4)	15.75	28.15	35.46" / 2.96'	9.08	8.63	36.84
Pent (5)	15.75	28.15	44.13" / 3.68'	11.30	10.74	45.47
Hex (6)	15.75	28.15	52.80" / 4.40'	13.52	12.84	54.10
Septa (7)	15.75	28.15	61.47" / 5.12'	15.74	14.95	62.73
Octo (8)	15.75	28.15	70.14" / 5.85'	17.96	17.06	71.36
Nono (9)	15.75	28.15	78.81" / 6.57'	20.18	19.17	79.99
Decka (10)	15.75	28.15	87.48" / 7.29'	22.40	21.28	88.62



## Dimensions & Capacity

Module (Units)	Width (inches)	Length (inches)	Height (inches/ft)	Tank Vol (cf)	Storage Vol (cf)	Weight (lbs)
Single Panel	19.68	23.62	1.97" / 0.163'	0.53 cf	0.48	4.00 lbs

\*Stack Individual Units to Make Any Height Up To 10'



## Specifications

Item	Description	R-Tank	R-Tank <sup>HD</sup>	R-Tank <sup>SD</sup>	R-Tank <sup>XD</sup>
		Value	Value	Value	Value
<b>Void Area</b>	Volume available for water storage	95%	95%	95%	90%
<b>Surface Area Void</b>	% of exterior available for infiltration	90%	90%	90%	90%
<b>Compressive Strength</b>	ASTM D 2412 / ASTM F 2418	30.0 psi	33.4 psi	42.9 psi	320 psi*
<b>Unit Weight</b>	Weight of plastic per cubic foot of tank	3.29 lbs/cf	3.62 lbs/cf	3.96 lbs/cf	7.55 lbs/cf
<b>Rib Thickness</b>	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	
<b>Service Temperature</b>	Safe temperature range for use	-14 - 167° F	-14 - 167° F	-14 - 167° F	-14 - 185° F
<b>Recycled Content</b>	Use of recycled polypropylene	100%	100%	100%	100%
<b>Minimum Cover</b>	Cover required for HS-20 loading	Green Space Only	20"	18"	6"
<b>Minimum Cover</b>	Cover required for HS-25 loading	Green Space Only	24"	18"	6"
<b>Maximum Cover</b>	Maximum allowable cover depth	36"	6.99'	9.99'	16.7'

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