







Is your stormwater detention system taking up too much space? Bring it down to size with the R-Tank System, the most efficient and versatile underground stormwater storage system available today. Whether you need to reduce your system footprint to resolve a utility conflict or free up space for a future expansion, R-Tank will give you the smallest footprint, provide more options for vehicular loading and cover depths, and deliver more installation versatility than any other system around.



The R-Tank System includes five different module configurations, providing system height options from 2" to over 7' tall. And it delivers support for HS-20 and HS-25 traffic with cover depths from 6" all the way up to over 16'. Whether you're designing a project at the beach with minimal depth over the water table, or a deep system in the hills, R-Tank has you covered.

With an unlimited array of system footprints and configurations, R-Tank solves tough stormwater problems by perfectly adapting to the needs of your site. Give R-Tank a shot on your next project, and prepare to be impressed.

R-TANK®

BENEFITS

High Capacity

• 95% void internal area

Strength

- Easily supports traffic loading from parking lots and roads
- Module options for HS-20 and HS-25 rating with cover depths from 6 inches to 16 feet

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 postconstruction 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

Recycled Content

• Manufactured with recycled polypropylene





- Light Duty module (30 psi)
- Ideal for applications in green space
- Not rated for vehicular traffic
- 12" Minimum cover, 36" maximum cover
- Four internal plates



- Heavy Duty module (33.4 psi)
- Standard module for HS-20 traffic applications
- 20" Minimum cover, 84" Maximum cover



• Five internal plates



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



- Ultra Duty module (134.2 psi)
- Traffic loads with 12" of cover
- Available from 14" 66" tall
- Ideal for high water table sites



- Extreme Duty module (320 psi)
- Traffic loads with 6" cover
- 16.5' maximum cover
- Available from 2" 10' tall
- 90% 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 2.03 for additional information.

3. 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).

3.05 A2).

6. LATERAL LOADS

As systems get deeper, the loads acting on the sides of the tank increase. While vertical loads often control the design, be sure to consider lateral loading, as well.

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 an R-Tank System using the AASHTO LRFD Bridge Design Specifications. 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.

LOW IMPACT DESIGN AND GREEN INFRASTRUCTURE

As much of the nation's Gray Infrastructure continues to decay, new concepts for a better way to rebuild it are emerging through Green Infrastructure (GI) and Low Impact Development (LID). This type of reconstruction moves beyond traditional systems that do ONE THING very well to systems that accomplish MULTIPLE objectives simultaneously. ACF has several technologies that dovetail with the goals of LID and GI that can play a significant role in the redevelopment process.



R-TANK®

Pipe and stone are used in traditional systems to move and store runoff. R-Tank does the same job, but with several additional benefits.

- Stores and moves runoff
- Open system encourages infiltration
- Stores 138% more water than stone
- Easily handles traffic loads beneath sidewalks and streets
- Ships flat to reduce site disturbance

- Moves water slowly, increasing time of concentration
- Fully accessible for maintenance
- Maximizes storage potential of GI practices like bioretention, street tree pits, etc.



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 and dedicate significant future funds to maintenance. FocalPoint reduces the space requirements and maintenance costs 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 and maintenance costs of traditional bioretention systems
- Encourages infiltration to reduce volume of water discharged
- Pair with R-Tank[®] to maximize water storage and transport



R-TANK

RUNOFF REDUCTION TECHNIQUES

PERMEABLE PAVEMENTS

Traditional pavements move vehicles efficiently, but are easily damaged by stormwater. ACF specializes in pervious pavements that handle traffic easily while providing surface infiltration rates 10 times higher than traditional pervious pavements. High surface infiltration rates reduce the expense of long-term maintenance and the headaches that go with it.

- Handles all vehicular loads
- Drains ten times faster than competing pervious pavements
- Reduces long-term maintenance costs
- Encourages infiltration
- Pair with R-Tank[®] to maximize water storage and transport



MAINTENANCE

Designing an R-Tank System with longevity and maintenance in mind is a simple three-step process:

1. PREVENT

Keep debris and sediment out of the system by pre-treating runoff with the Trash Guard Plus[®] unit (see below). For a more centralized approach, you could consider having the R-Tank units penetrate the connecting structure, which allows the use of the R-Tank[®] as its own trash screen. This works best with a structure that includes a sump (see drawing to right).

2. ISOLATE

Trap solid pollutants inside the maintenance row (see drawing to right) where they can be easily removed, using the Maintenance Modules (available in LD, HD, and UD only). These modules are wrapped in geotextile to retain solids and are fully accessible by conventional jet-vac systems to remove captured pollutants.

3. PROTECT

Ensure a long system life by including maintenance ports to remove any pollutants that evade the pretreatment system and maintenance row. Maintenance ports should be specified within 10' of inlet and outlet connections, and roughly 50' on center (see detail on page 7).

MAINTENANCE PREVENTION

TRASH GUARD PLUS®

Trash Guard Plus[®] is a patented stormwater pretreatment device that captures debris, sediment and floatables. Easy to install and maintain, it is a fraction of the cost of other pretreatment devices.

Benefits of Trash Guard Plus®

- Simple retrofit to existing catch basins
- Installs without heavy equipment
- Quick and easy assembly
- Adjusts to irregular catch basin bottoms and/or walls
- Eliminates eyesore stormwater trash at public parks, beaches, and waterways
- Removes harmful nutrients and regulated metals







INLET CONNECTION

MAINTENANCE ROW

TYPICAL DESIGN

28.57 19.7

Module Drawing - Double

Composite Details



CAD DRAWINGS

Maintenance Module - Double



Maintenance Port



Selecting the Right R-Tank Module								
Cover Depth* (Inches)	LD	HD	SD	UD	XD			
Minimum 6"	Green Space - No Traffic	HS-20						
12"	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	HS-20**	HS-20			
14"	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	HS-20	HS-20			
18"	Green Space - No Traffic	Green Space - No Traffic	HS-20	HS-20	HS-20			
20"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20			
24"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20			
36"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20			
48"	-	HS-20	HS-20	HS-20	HS-20			
60"	-	HS-20	HS-20	HS-20	HS-20			
72"	-	HS-20	HS-20	-	HS-20			
84"	-	-	HS-20	-	HS-20			
120"	-	-	HS-20	-	HS-20			
160"	-	-	-	-	HS-20			
Maximum 200"	-	-	-	-	HS-20			

HS-20 designation based on AASHTO LRFD Bridge Design Specification for Single Lane Traffic

* Cover depth is measured from the top of the module to the finished grade or top of pavement.

** The UD module requires STONE backfill (not soils) on the sides at this depth.

PRODUCT SPECIFICATION



Module (Segments)	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight* (lbs)			
Mini	15.75	28.15	9.45"/0.79'	2.42	2.30	10.1/10.9			
Single(1)	15.75	28.15	17.32"/1.44'	4.44	4.22	15.7/17.3			
Single + Mini(1.5)	15.75	28.15	25.98"/2.17'	6.67	6.33	23.6/25.9			
Double (2)	15.75	28.15	33.86"/2.82'	8.69	8.25	29.1/32.3			
Double + Mini(2.5)	15.75	28.15	42.52"/3.54'	10.91	10.36	37.0/41.0			
Triple (3)	15.75	28.15	50.39"/4.20'	12.93	12.28	42.5/47.4			
Triple + Mini(3.5)	15.75	28.15	59.06"/4.92'	15.15	14.39	50.4/56.0			
Quad(4)	15.75	28.15	66.93"/5.58'	17.17	16.31	55.9/62.4			
Quad + Mini(4.5)	15.75	28.15	75.59"/6.30'	19.39	18.42	63.8/71.0			
Pent(5)	15.75	28.15	83.46"/6.96'	21.41	20.34	69.3/77.4			

*Weights shown are for LD/HD modules.



Module (Segments)	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight (Ibs)			
Single (1)	23.62	23.62	14.17"/1.18'	4.57	4.35	21.2			
Double (2)	23.62	23.62	27.17"/2.26'	8.77	8.33	39.0			
Triple (3)	23.62	23.62	40.16"/ 3.35'	12.97	12.32	56.8			
Quad (4)	23.62	23.62	53.15"/4.43'	17.16	16.30	74.6			
Pent (5)	23.62	23.62	66.14"/5.5'	21.35	20.29	92.4			

TANK							
	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight (Ibs)	
	15.75	28.15	9.45"/0.79'	2.42	2.30	10.95	

18.12"/1.51'

26.79"/2.23'

35.46"/2.96'

44.13"/3.68'

4.64

6.86

9.08

11.30

GD

4.41

6.52

8.63

10.74

19.58

28.21

36.84

45.47

15.75	28.15	87.48"/7.29'	22.40	21.28	88.62
15.75	28.15	78.81"/6.57'	20.18	19.17	79.99
15.75	28.15	70.14"/5.85'	17.96	17.06	71.36
15.75	28.15	61.47"/5.12'	15.74	14.95	62.73
15.75	28.15	52.80"/4.40'	13.52	12.84	54.10



Module (Segments)	Width (inch)	Length (inch)	Height (inch)	Volume (cf)	Capacity (cf)	Weight (lbs)		
Single (1)	19.68	23.62	1.97	0.53	0.48	4		
Double (2)	19.68	23.62	3.94	1.06	0.95	8		
Triple (3)	19.68	23.62	5.91	1.59	1.43	12		
Quad (4)	19.68	23.62	7.87	2.12	1.91	16		
Pent (5)	19.68	23.62	9.84	2.65	2.38	20		

Note: XD modules may be stacked up to 10' tall (60 layers).

Specifications			ED	GD	FTD	FEDI
Item	Description	Contraction of the second	Contraction of the second		CP	
Void Area	Volume available for water storage	95%	95%	95%	95%	90%
Surface Area Void	% of exterior available for infiltration	90%	90%	90%	90%	90%
Compressive Strength	ASTM D2412 / ASTM F2418	30.0 psi	33.4	42.9 psi	134.2 psi	240.2 psi
Unit Weight	Weight of plastic/cubic foot of tank	3.29 lbs/cf	3.62 lbs/cf	3.96 lbs/cf	4.33 lbs/cf	7.55 lbs/cf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	-	-
Service Temperature	Safe temperature range for use	-14 - 167º F	-14 - 167º F	-14 - 167º F	-14 - 167º F	-14 - 167 ⁰ F
Recycled Content	Use of recycle polypropylene	100%	100%	100%	100%	100%
Minimum Cover	Cover required for HS-20 loading	Not Traffic Rated	20"	18"	12"-14"	6"
Minimum Cover	Cover required for HS-25 loading	Not Traffic Rated	24"	18"	15"-17"	6"
Maximum Cover	Maximum allowable cover depth	3.0'	6.99'	9.99'	5.0'	16.7'

Module

(Segments)

15.75

15.75

15.75

15.75

28.15

28.15

28.15

28.15

Single (1)

Double (2)

Triple (3)

Quad (4)

Pent (5)

Hex (6)

Septa (7)

Octo (8)

Nono (9) Decka (10)

