



INFRASTRUCTURE SOLUTIONS DELIVERED

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# R-TANK® STORMWATER STORAGE SYSTEM





# STORMWATER MANAGEMENT

## IS YOUR STORMWATER SYSTEM TAKING UP TOO MUCH SPACE?

R-Tank can reduce your underground stormwater storage system footprint, avoiding nearby utility conflicts, freeing up space for future expansion and overcoming construction phase challenges.

## DOES YOUR PROJECT REQUIRE A UNIQUE SOLUTION DUE TO DEPTH OR TRAFFIC LOADS?

R-Tank provides system height options from 2 inches to over 7 feet tall. It also accommodates HS-20 and HS-25 loading with cover depths as little as 6" and as deep as 16'.



R-Tank solves tough stormwater problems by adapting to the needs of your site—whether you are designing a project with shallow ground water or deep cover conditions.

# R-TANK

## BENEFITS

### HIGH CAPACITY

- 95% void internal area (LD, HD, SD, UD)
- 90% void internal area (XD)

### STRENGTH

- Supports traffic loading
- Module options for HS-20 and HS-25 rating with cover depths from 6" to 16'

### DESIGN AND CONSTRUCTION VERSATILITY

- Modules can be combined into various shapes to use space efficiently and effectively
- Module heights vary from 2" to 7"

### INCREASED INFILTRATION AND EXFILTRATION

- 90% open area on face of modules
- Increases groundwater recharge, reducing post-construction discharge volumes

### EASY TO TRANSPORT

- Can be supplied preassembled or unassembled to reduce delivery costs

### LIGHTWEIGHT AND QUICK TO INSTALL

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

### RECYCLED CONTENT

- Manufactured with post industrial grade recycled polypropylene

## PRODUCTS

### R-TANK LD

- 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

### R-TANK HD

- Heavy-duty module (33.4 psi)
- 20" minimum cover
- 84" maximum cover
- Five internal plates
- Standard module for traffic applications



### R-TANK SD

- Super-duty module (42.9 psi)
- Higher safety factors for shallow traffic applications and deeper cover
- 18" minimum cover
- 120" maximum cover



### R-TANK UD

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



### R-TANK XD

- Extreme-duty module (320 psi)
- Traffic loads with 6" cover
- 16.5' maximum cover
- Available from 2" to 10' tall



# DESIGN CONSIDERATIONS

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

## 1. PRE-TREATMENT

Removing pollutants from runoff before they enter an underground detention system is the smart way to design and build a system. Trash Guard Plus® is a great tool for this. Be sure the system you select will remove heavy sediments, gross pollutants (trash) and biodegradable debris.

## 2. BACKFILL MATERIALS

Backfill materials should be angular stone (<1.5" in diameter) or soil (GW, GP SW or SP per the Unified Soil Classification System). Material must be free from lumps, debris and sharp objects that could cut the geotextile. See the R-Tank narrative specification 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. Any infiltration that can be achieved on the site should also be taken advantage of. 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 R-Tank below the water table is manageable, a stable base must be created to support the system. Ground water can be allowed to enter and drain from the system, or a liner can be used to prevent ground water from entering the system if measures are taken to prevent the system from floating.

## 5. CONSTRUCTION LOADS

Construction loads are often the heaviest loads the system will experience. Care must be taken during backfilling and compaction, and post-installation construction traffic should be routed around the system.

## 6. LATERAL LOADS

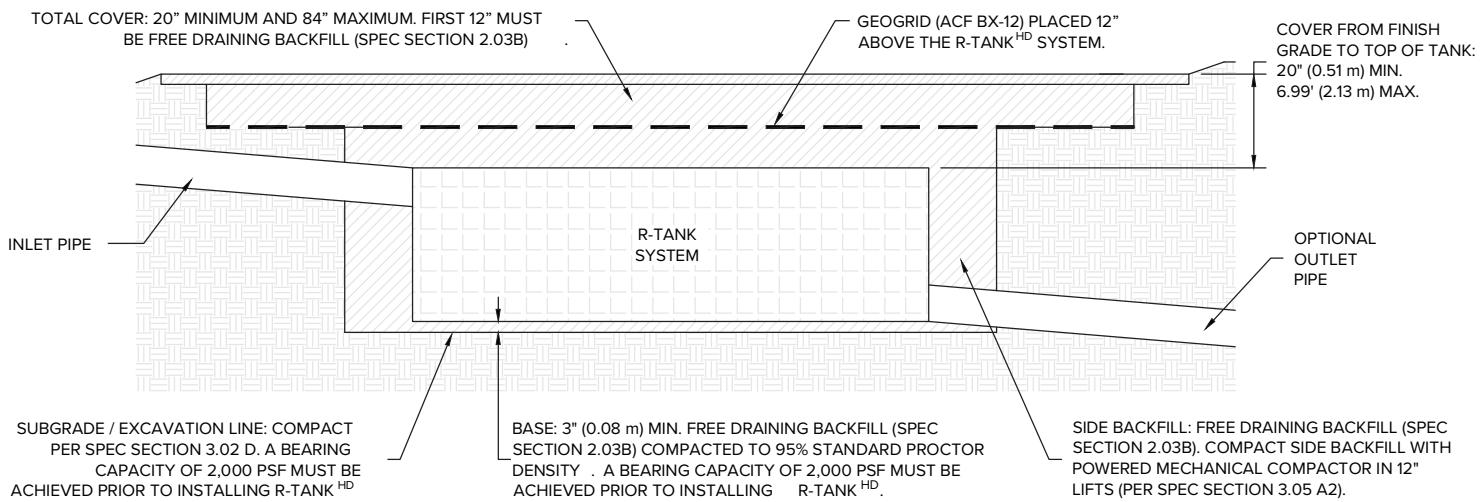
As systems get deeper, the loads acting on the sides of the tank increase. While vertical loads often control the design, lateral loads should also be considered.

## 7. R-TANK MODULES

Selecting the right module for your application is critical. See page 3 and the specs on the back of this brochure for details. Our team is also here to help!

## 8. LOAD MODELING

A safety factor of >1.75 is required when designing an R-Tank System using the AASHTO LRFD Bridge Design Specifications. It is also necessary to run your own loading model with site specific requirements.



# CREATIVE URBAN GREEN INFRASTRUCTURE APPLICATIONS



## R-TANK UNDER PERMEABLE AND POROUS SURFACES

For projects with shallow depth restrictions and high ground water table elevations, R-Tank can be strategically deployed beneath permeable and porous surfaces. The high void space of the modules allows designers to maximize the volume stored at shallow depths and converts the permeable/porous surface into an “inlet” to the storage below. Ferguson offers a selection of “alternative surfaces” that can be paired with the R-Tank.



## R-TANK IN LINEAR GREEN STREETSCAPES

Based on its space efficiency and modular versatility, the R-Tank is a popular option for storage of stormwater in urban linear street applications. Beyond the void efficiency, the system layout can be easily adjusted to work around unexpected utility conflicts and other site features. Green Infrastructure programs in Philadelphia, Pittsburgh, New York City, and Salt Lake City are just a few examples of where R-Tank has been adopted in this application.



## UNDER BIORETENTION FOR ENHANCED STORAGE

In many green stormwater practices, R-Tank can offer an “enhanced” storage zone providing 95% void space vs. the typical 40% void space of stone. Throughout the country, engineers have utilized this approach to maximize capacity and reduce the depth of excavation of the storage layer in rain gardens, bioretention and curbline vegetated stormwater practices.



## COMBINED WITH INNOVATIVE MEDIA

Ferguson offers a series of innovative stormwater filtration media to provide water quality treatment. The R-Tank can be used in these systems as a space-efficient high-performance underdrain with the option to expand over larger footprints for infiltration or detention. R-Tank can also be used to house media in certain applications and systems.



## INNOVATIVE APPLICATIONS (FLOOD MITIGATION, RE-USE, ETC.)

The R-Tank is a popular choice under playgrounds and sports fields. The high void space and the ability to work around light pole bases, equipment footings and foundations allows municipalities to maximize storage when developing or redeveloping these community gems. The system can also be lined and combined with pump equipment for irrigation and other re-use applications.

# MAINTENANCE

## DESIGNING AN R-TANK SYSTEM WITH LONGEVITY & MAINTENANCE IN MIND IS A THREE-STEP PROCESS:

### 1. PRE-TREAT

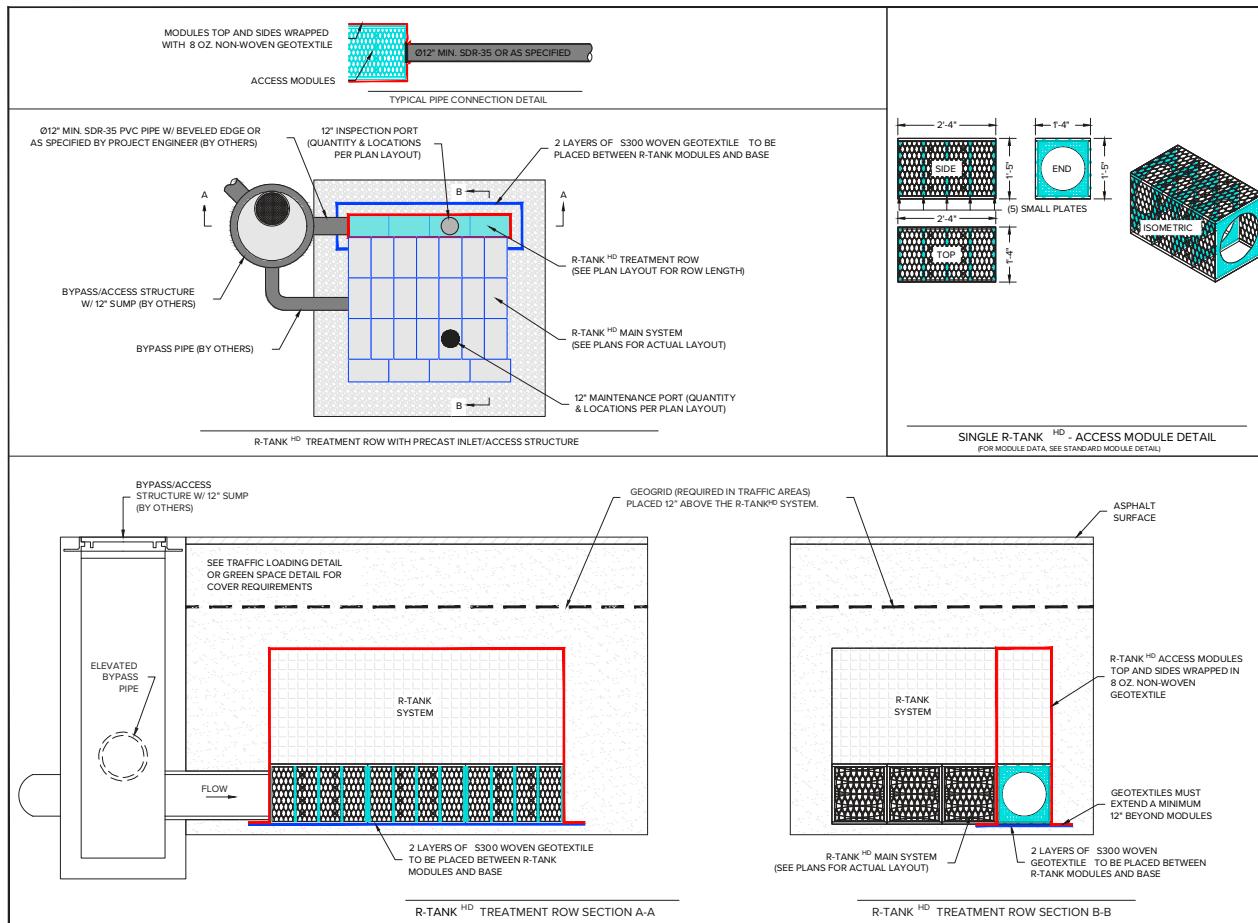
Keep debris out of the system using decentralized filters and screens. Ferguson offers a complete range of options from perforated screen devices to high flow geotextile bag and cartridge based filter drain inserts.

### 2. ISOLATE

Trap solid pollutants inside the treatment row (see treatment row drawing below) where they can be easily removed using the access 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 pre-treatment system and treatment row. Maintenance ports should be specified within 10' of inlet and outlet connections, and roughly 50' on center.



## PRE-TREATMENT DEVICES

From simple trash and debris screens to filters for targeted pollutants, Ferguson offers a complete selection of decentralized pre-treatment devices.



TRASHGUARD PLUS



FABCO STORMBASIN



FABCO STORMRING

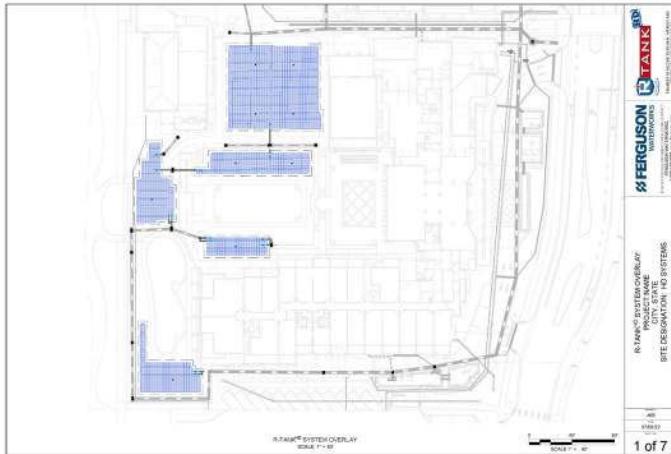


FABCO STORMSACK

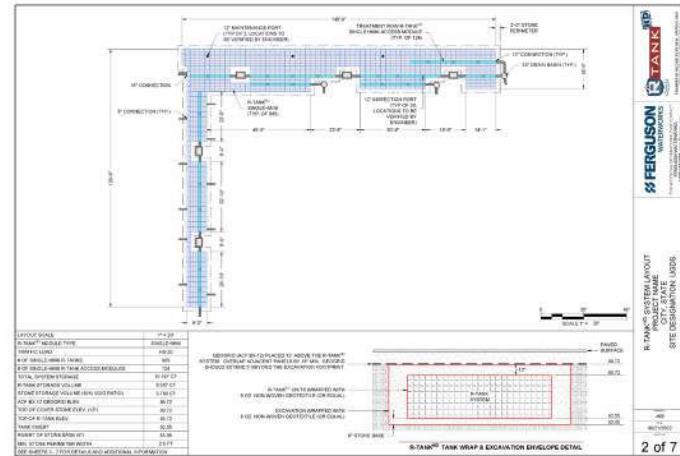


# SUPPORT SERVICES AND TANK SELECTION

Our regional engineers and designers are well versed in local regulations, innovative urban green street applications and can help develop site-specific solutions using one or a combination of our products. Our team produces high-quality custom layouts and details to support your permitting and construction efforts. From AutoCAD to HydroCAD, we have a variety of design tools to help you move through the permitting process efficiently.



SAMPLE R-TANK SYSTEM OVERLAY



SAMPLE R-TANK SYSTEM LAYOUT



R-TANK SD INSTALLATION



R-TANK WITHIN BUILDING FOOTPRINT

## SELECTING THE RIGHT R-Tank MODULE

Cover Depth  
(inches)\*

**LD**

**HD**

**SD**

**UD**

**KD**

Cover Depth (inches)*	LD	HD	SD	UD	KD
Min. 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
Max. 200"					HS-20

HS-20 designation based on AASHTO LRFD Bridge Design Specification for single lane traffic.

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

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

# R-TANK SPECIFICATIONS

**LD**

**HD**

**SD**

## DIMENSIONS & CAPACITY

Module (Segments)	Width (in)	Length (in)	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

## DIMENSIONS & CAPACITY

Module (Segments)	Width (in)	Length (in)	Height (in/ft)	Volume (cf)	Capacity (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"/1.51'	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

\*Weights shown are for LD/HD modules.

**UD**

**XD**

## DIMENSIONS & CAPACITY

Module (Segments)	Width (in)	Length (in)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight (lbs)
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

## DIMENSIONS & CAPACITY

Module (Segments)	Width (in)	Length (in)	Height (in)	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

**LD**

**HD**

**SD**

**UD**

**XD**

Item	Description	Value	Value	Value	Value	Value
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 D 2412/ASTM F 2318	30.0 psi	33.4 psi	42.9 psi	134.2 psi	320 psi
Unit Weight	Weight of plastic per 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"	0.18"	0.18"	-	-
Service Temperature	Safe temperature range for use	-14–167° F	-14–167° F	-14–167° F	-14–167° F	-14–167° F
Recycled Content	Use of recycled polypropylene	100%	100%	100%	100%	100%
Minimum Cover	Cover required for HS-20 loading	Not traffic rated	20"	18"	12"-14"	6"
	Cover required for HS-25 loading	Not traffic rated	24"	18"	15"-17"	6"
Maximum Cover	Maximum allowable cover depth	36"	6.99'	9.99'	5.0'	16.7'

Contact your local sales associate:

Call **615-824-1200** or visit [www.jenhill.com](http://www.jenhill.com) to get started.