STORMWATER MANAGEMENT

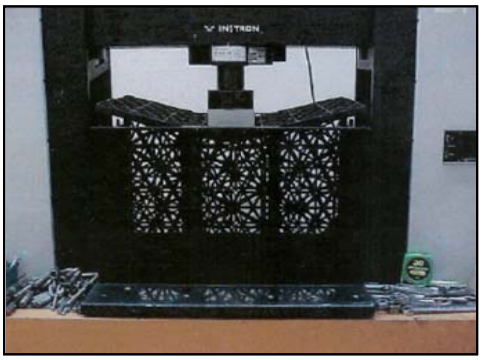
RainTank Load Support

RainTank is capable of easily supporting AASHTO H20 traffic loads with safety factors nearly **double** the AASHTO requirement. It has been used in truck stops (where loaded trucks park above the system over night, pictured right), unpaved Trucking Terminals, and even below a buildings first floor parking garage. Read on and we'll explain how RainTank handles these extreme loads, and why it will work under all H20 loads

RainTank has been chosen for thousands of tough applications.

Bearing Capacity

Most engineers use 34 psi as RainTanks ultimate design load. This bearing capacity is derived from a test using a **point load** on an **unconfined** RainTank unit (pictured at right). This type of test yields extremely conservative results. That's why you won't see similar test results for any of the competitive underground detention/retention systems: they will not hold up under a concentrated load without the confining pressure of the backfill. But the RainTank – without backfill – is a structural unit that gives the engineer a workable design load in a scenario far worse than any acceptable field application. And this sturdy foundation is just the beginning.



Compression Test – Fail at 34 psi.

Typical Load Calculation

The AASHTO H20 Standard uses a 32,000 lbs axle as the design load. To accurately model the RainTanks performance below a parking lot (or any H20 Load) add a Dynamic Factor to account for the movement of that load (typically 1.2, or an increase of 20%) and the weight of the saturated fill. The example shown (right) uses 18" of cover – the minimum amount – with a 45 degree load distribution angle to transfer the tire contact area down to the top of the RainTank. Running this simple equation yields a safety factor of well over 4 when comparing the applied load to the strength of the RainTank.

Sample Calculation

W = 8,000 lbs (32,000 lb axle / 4 wheels/axle)
F_d = 1.2
A = 1661 si (18" cover w/45 degree angle)
dy = 1.35 psi (18 ci saturated sand @ 130 lbs/cf)

σ_{va} = (8,000 lbs x 1.2 / 1661 si) + 1.35 lbs

σ_{va} = 7.13 psi

Safety Factor = 4.77

(34 psi ultimate bearing capacity / 7.13 psi applied load)

While a safety factor of 4.7 is already highly conservative – more than double the AASHTO requirement – remember that we are comparing the applied load to the strength of the RainTank as derived from the application of an unconfined point load! And to go one step further, a geogrid is always used in H20 applications, making the design even more conservative.

CONSTRUCTION ECO SERVICES

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Third Party Verification

Modeling product performance using engineering equations to ensure a successful project in important. What really matters is product performance in the field. That's why we asked IAMPO, an independent third party firm, to verify the ability of RainTank to support a 32,000 lbs axel load (H20) under their preexisting testing standard. But they went one step further: they removed the geogrid and loaded the axel up to 32,100 lbs. Even in these harsh conditions, the RainTank performed as expected, easily handling the load.

IAPMO Test

Real World Performance

Your project REQUIRES a proven system. With thousands of installations in 32 countries around the world, many in place since the early 90's, RainTank has proven itself again and again as one of the strongest systems available for underground detention/retention. Specify RainTank and you can be confident your system will support the traffic loads above. Call Construction EcoServices today to discuss your project's requirements.

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