

# Jacopa Tipping Bucket



## Key Features & Benefits:

- Can be fitted in new design or retrofitted into existing tanks.
- Can be installed in attenuation sewers.
- Small units can be used to clean static CSO screens.
- Automatically tips when water filled.
- Robust construction in stainless steel grade 304 or 316L.

## How We Create Value:

- Low operating cost.
- Flushing lengths of up to 50 m can be accommodated with a single flush.
- Minimal Maintenance needs.
- Automatically flushes after storm tank emptying.
- 25 year design life due to quality of manufacture.



**The Jacopa Tipping Bucket system is a highly efficient, low cost, method of cleansing Storm water tanks, attenuation sewer constructions and static CSO screens. Storm tanks of up to 50 m in size can also be cleaned using the system and the equipment can be retrofitted into existing structures.**

Due to increasing hydraulic loading, storm tanks and attenuation sewers are commonly constructed to attenuate flows. This inevitably leads to debris deposition on the floor of these structures. The Jacopa Tipping Bucket is a highly efficient cleaning system to maintain the cleanliness of storm tanks and attenuation sewers, reducing operational problems and odours.

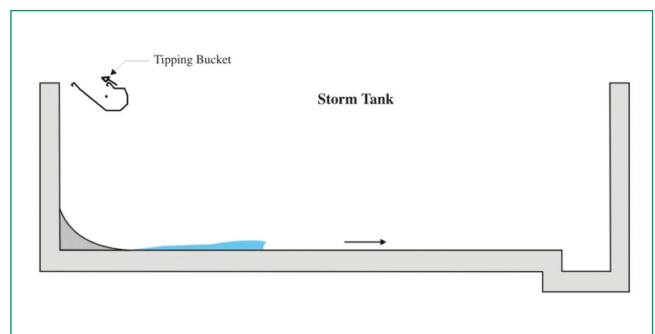
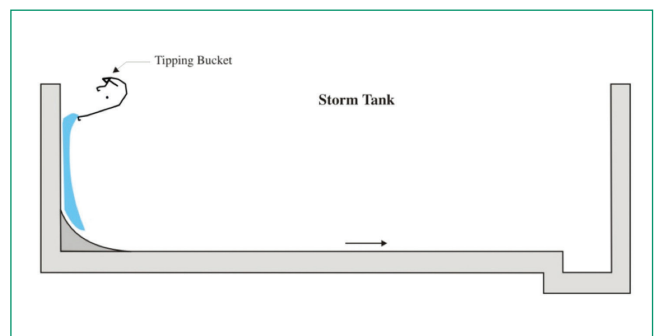
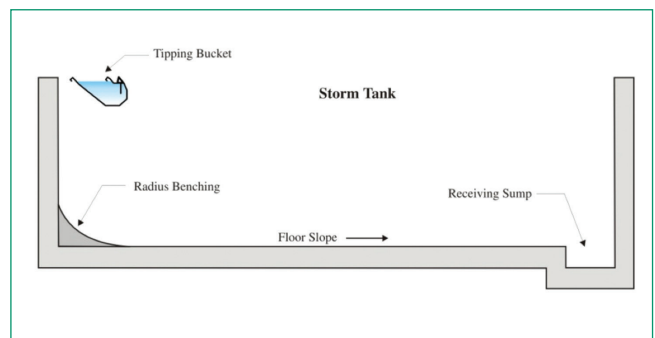
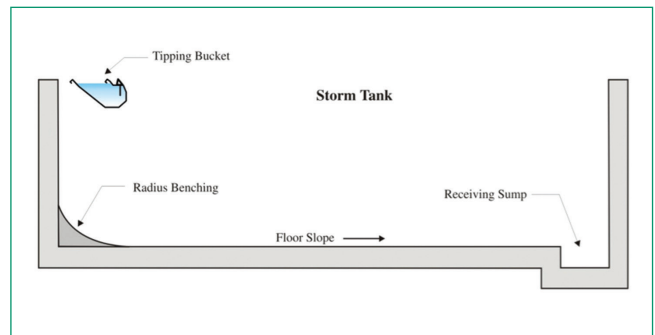
The tipping bucket is mounted at the top end of the tank / sewer, and is filled via a water supply. A simple control panel operates a valve to allow the bucket to fill once the tank has been emptied. Once the bucket reaches capacity, the centre of gravity reaches a position where it causes the bucket to rotate, dropping the contents into the tank. The flush water is released as a surge wave which re-suspends debris and carries it to the receiving sump at the lower end of the structure leaving the floor clean.

If designing a new attenuation tank/sewer, the receiving sump should be designed with a minimum capacity of 1.2 times the bucket volume to prevent 'wash-back'.

### Bucket Control:

The tipping bucket can be operated manually by opening a valve on the fill water supply and waiting until the bucket fills and automatically tips. Alternatively, Jacopa can supply a control panel combining an ultrasonic level control that monitors the tank filling and emptying, and then automatically opens the water control valve for a programmed time sufficient to fill the bucket to its tipping point.

Once the water has been dropped, the bucket returns to its start position awaiting the next fill.



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## **Additional Information**

The Tipping Bucket system is manufactured from highly durable grade 304 or 316 stainless steel with the bucket fabricated from formed sheet material with sufficient internal bracing to make the system lightweight for ease of installation but rigid in mode of operation.

The fabricated bucket is suspended from two arms approximately at the ends of the bucket. The bucket is free to pivot within the restraints of the rubber stops; two self-aligning bearings, which are lubricated for life, are used to achieve this. The bearing housing

is made water tight with the aid of shaft seal around the pivot axis and flat fabric washers between bearing housing and end plates. The internal volume of bearing housing is packed with general-purpose grease.

The Jacopa Tipping Bucket is designed to be installed into any storm water retention tank, whether below (closed) or above (open) ground.

The cross section of the "Tipping Bucket" is a wedge shape and with its centre of gravity in a position so that when the bucket is empty it assumes an upright position. As the bucket is filling with water

the centre of gravity of the bucket and the water will move across the bearing pivot points until it reaches a position where equilibrium is lost and the bucket begins to tip, cascading its contents down the back wall of the tank along the sloping gradient of the floor towards the draining end.

This large volume of water by virtue of its height above the tank floor has substantial potential energy and when dropped will produce a very effective wave action which will sluice along the tank carrying with it into the draining trough all accumulated sludge, silt or other debris.

This action will in most cases completely clean the tank floor with one wash but should complete cleansing not be attained the filling and washing process can be repeated as often as is required.

The filling of the bucket may be achieved in a number of ways; the simplest system is to manually fill after a storm event i.e. via a fixed stopcock pipework arrangement located within the control house.

Alternatively, an automated control system to do this which operates through the use of an ultrasonic level sensor; which signals to the control PLC that the tank has emptied and bucket filling may begin. A solenoid valve is then opened on a timer.

### **Automated Flushing**

The system will also include proximity head switch (Inductive), for controlling water supply into the bucket, gate valve and check valve in supply line. All new pipework shall be lagged.

The bucket is finely balanced and tips on two sealed bearings, once the bucket has been filled and the centre of gravity shifts. Typically the bucket is filled using final effluent or site water. The emptying of the tank and the filling of the Tipping Bucket can be



either manually operated or fully automated. To ensure optimum operation, a curve needs to be created below the bucket and between the tank wall and floor, as detailed in the *Design Criteria*. A sump at the discharge end of the tank, approximately 120% of the bucket volume, is ideal to prevent backwash up the tank floor, but is not essential as this is normally minimal.

### **Control Philosophy**

1. Storm tank full - system NOT activated.
2. Storm tank starts to drain.
3. Ultrasonic level sensor sends signal to control panel.
4. Wash-water system activated.  
*\*If water is pumped then start submersible pump.*
5. Solenoid valve energise.
6. Tipping Bucket starts to fill.
7. Tipping Bucket tips.
8. Proximity switch triggered.
9. Solenoid valve shuts water supply to bucket.
10. Shut down wash water pumps, if used.

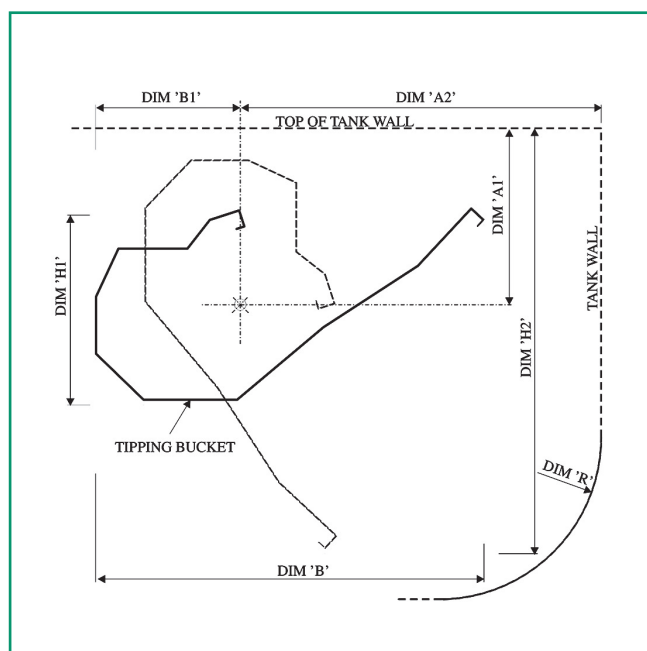
*If there is more than one Tipping Bucket installed the system will index to the next storm tank and repeat steps 4-10.*

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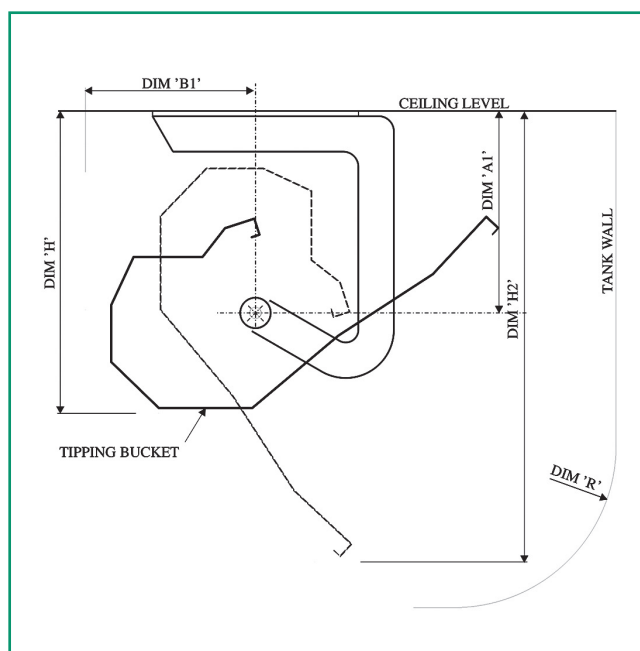
## Models

Tipping Buckets are manufactured from stainless steel in two configurations:

### Series I - Wall / Coping Stone Mounted



### Series II - Ceiling Mounted



Series I - Wall / Coping Stone Mounted				Use for Bracket Lengths of up to 6.0 m long				
Model	Ltr / m	A1	A2	B	B1	H1	H2	R
Type 1	350	500	1150	1101	418	553	1183	800
Type 2	500	765	1350	1355	525	665	1595	1000
Type 3	700	765	1610	1620	625	795	1760	1000
Type 4	1050	870	1780	1915	713	936	2150	1500
Type 5	1250	945	2000	1993	787	994	2240	1500
Type 6	1365	1000	2000	2175	860	1113	2315	2000

Series II - Ceiling Mounted				Use for Bracket Lengths over 6.0 m long				
Model	Ltr / m	A1	A2	B	B1	H1	H2	R
Type 1	350	695	1150	1101	418	553	1378	800
Type 2	500	830	1350	1355	525	665	1660	1000
Type 3	700	930	1610	1620	625	795	2080	1000
Type 4	1050	1060	1780	1915	713	936	2390	1500
Type 5	1250	1165	2000	1993	787	994	2372	1500

Tipping buckets can be provided with a range of capacities and in lengths from 1 m up to 16 m. The choice of size is dependent upon the width of tank, flushing length, floor gradient and height of bucket above the tank floor.

**Series I Buckets** of lengths 1 m to 6 m are supported at each end with wall-mounted pivots.

**Series II Buckets** are supported by intermediate support mounted from a ceiling or support beam.



Bucket Type	SERIES I		SERIES II	
	Empty (Weight/m)	Full (Weight/m)	Empty (Weight/m)	Full (Weight/m)
Type A	75	350	82	350
Type B	100	500	110	500
Type C	150	700	165	700
Type D	175	1050	195	1050
Type E	200	1250	220	1250

# Jacopa Tipping Bucket



Bucket Type	Bucket height above tank floor (m)	Floor Slope %	Maximum washing length (m)
<b>Type A</b>  Bucket Volume 350 litres / m	2	1 (1:100)	10
		2 (1:50)	11
		5 (1:20)	15
	3	1 (1:100)	15
		2 (1:50)	17
		5 (1:20)	23
	4	1 (1:100)	17
		2 (1:50)	21
		5 (1:20)	27
	6	1 (1:100)	19
		2 (1:50)	23
		5 (1:20)	29

Bucket Type	Bucket height above tank floor (m)	Floor Slope %	Maximum washing length (m)
<b>Type B</b>  Bucket Volume 500 litres / m	2	1 (1:100)	15
		2 (1:50)	18
		5 (1:20)	23
	3	1 (1:100)	20
		2 (1:50)	25
		5 (1:20)	32
	4	1 (1:100)	24
		2 (1:50)	28
		5 (1:20)	36
	6	1 (1:100)	26
		2 (1:50)	34
		5 (1:20)	42

Bucket Type	Bucket height above tank floor (m)	Floor Slope %	Maximum washing length (m)
<b>Type C</b>  Bucket Volume 700 litres / m	2	1 (1:100)	18
		2 (1:50)	23
		5 (1:20)	28
	3	1 (1:100)	23
		2 (1:50)	28
		5 (1:20)	35
	4	1 (1:100)	25
		2 (1:50)	32
		5 (1:20)	41
	6	1 (1:100)	28
		2 (1:50)	36
		5 (1:20)	46

# Jacopa Tipping Bucket



Bucket Type	Bucket height above tank floor (m)	Floor Slope %	Maximum washing length (m)
<b>Type D</b>  Bucket Volume 1050 litres / m	2	1 (1:100)	23
		2 (1:50)	27
		5 (1:20)	34
	3	1 (1:100)	27
		2 (1:50)	35
		5 (1:20)	44
	4	1 (1:100)	30
		2 (1:50)	39
		5 (1:20)	47
	6	1 (1:100)	32
		2 (1:50)	44
		5 (1:20)	53

Bucket Type	Bucket height above tank floor (m)	Floor Slope %	Maximum washing length (m)
<b>Type E</b>  Bucket Volume 1250 litres / m	2	1 (1:100)	24
		2 (1:50)	30
		5 (1:20)	37
	3	1 (1:100)	28
		2 (1:50)	37
		5 (1:20)	46
	4	1 (1:100)	32
		2 (1:50)	41
		5 (1:20)	51
	6	1 (1:100)	34
		2 (1:50)	44
		5 (1:20)	56

**Radius Curves:** Radius

**Type A**            800 mm  
**Type B & C**       1000 mm  
**Type C & D**       1500 mm



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