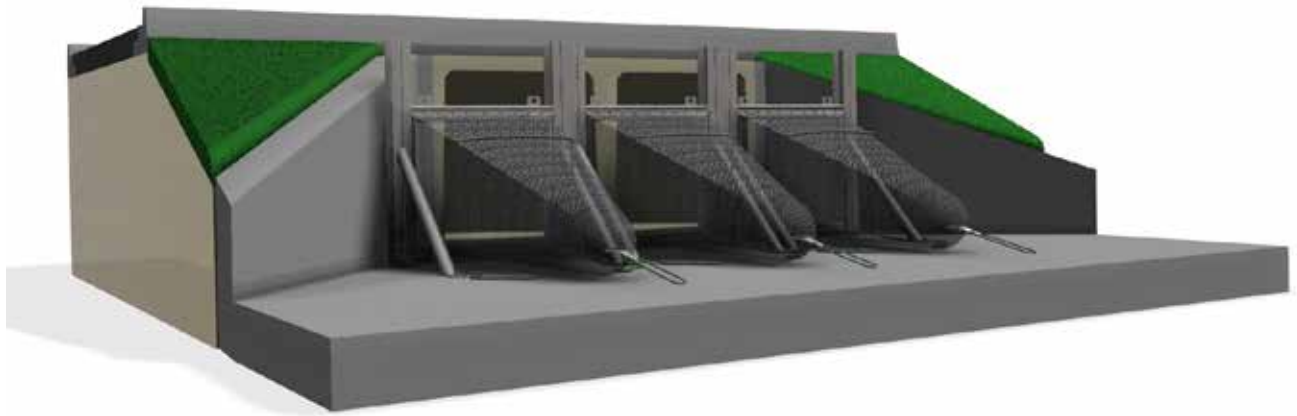


Ecosol™ Trash Rack Maintenance Guide



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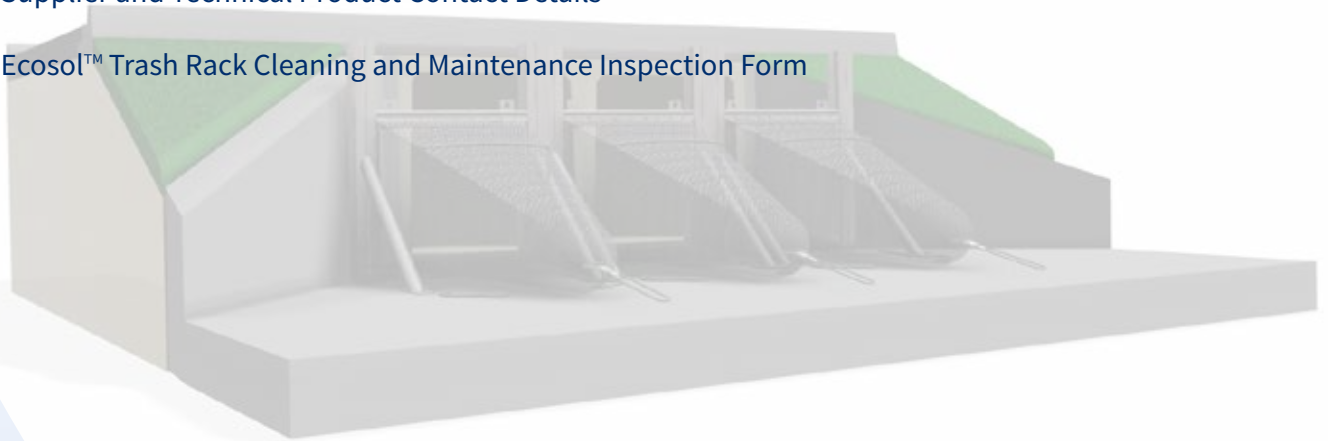
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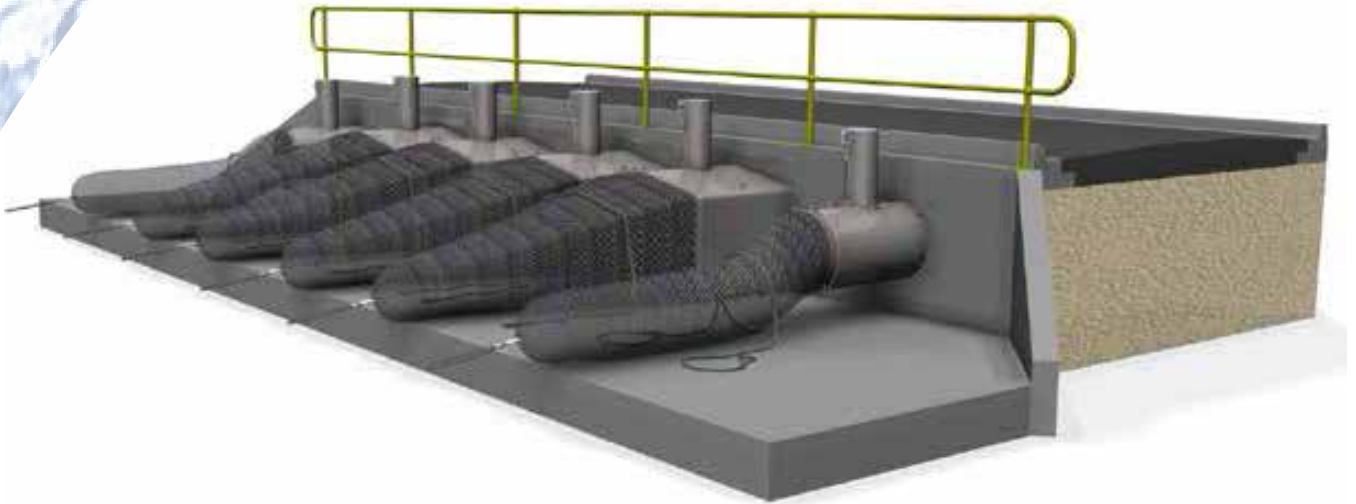
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The Ecosol™ Trash Rack has been designed specifically for easy on site cleaning and maintenance using a licensed waste contractor equipped with a crane truck.



1.0 Introduction

Urban Asset Solutions Pty Ltd has developed a standard modular trash rack system suitable for most applications. The Ecosol™ Trash Rack is a robust and modern primary treatment stormwater filtration system for use where there are cost or space constraints, or specialised cleaning equipment is not available. The unit's simple design overcomes any adverse hydraulic impact traditionally encountered with direct screening trash racks that often block in first flush flows. By incorporating filtration nets into the design its operating life is significantly improved with an increased screening surface area and larger pollutant holding capacity.

2.0 Key Dimensions

The below table provides a general guide on typical unit configurations and typical pollutant holding capacities for the Ecosol™ Trash Rack.

Model Ecosol Trash Rack	Pipe dia./ Box Culvert Height (mm)	Holding Capacity (m ³)	Designed Treatable Flow Rates (L/sec) at Grades up to 10%	Designed by-pass Capacity (L/sec) at grade up to					
				0.5%	1%	2%	5%	7%	10%
Cylindrical Pipe Units									
ETR 37	375	0.263	65	124	175	248	392	463	544
ETR 45	450	0.379	103	201	285	403	637	754	901
ETR 52	525	0.515	151	304	430	608	961	1137	1359
ETR 60	600	0.675	211	434	614	868	1372	1623	1941
ETR 67	675	0.853	282	594	840	1188	1879	2222	2675
ETR 75	750	1.053	369	787	1113	1574	2488		
ETR 82	825	1.274	468	1014	1435	2029			
ETR 90	900	1.518	582	1279	1809	2559			
ETR 105	1050	2.065	855	1351	1910				
Box Culvert Units (600mm wide)									
ETR B37 6	375	0.421	228	86	122	173	274	324	387
ETR B45 6	450	0.505	299	140	109	282	445	527	630
ETR B52 6	525	0.589	377	180	202	230	389	503	612
ETR B60 6	600	0.675	461	212	301	425	672	795	951
ETR B75 6	750	0.843	644	303	429	607	960	1136	1358
ETR B82 6	825	0.927	743	415	588	831	1315	1555	1859
ETR B90 6	900	1.012	820	550	779	1102	1742		
ETR B120 6	1200	1.180	960	709	1005	1420			
Box Culvert Units (900mm wide)									
ETR B37 9	375	0.632	342	86	122	173	274	324	387
ETR B45 9	450	0.750	449	140	109	282	445	527	630
ETR B52 9	525	0.884	566	180	202	230	389	503	612
ETR B60 9	600	1.012	691	212	301	425	672	795	951
ETR B75 9	750	1.264	966	303	429	607	960	1136	1358
ETR B82 9	825	1.390	1115	415	588	831	1315	1555	1859
ETR B90 9	900	1.518	1180	550	779	1102	1742		

Table 1 Ecosol™ Trash Rack key dimensions and flow capacities

3.0 Monitoring

Initially Urban Asset Solutions Pty Ltd recommends that regular monthly monitoring is undertaken. Once the unit has been in operation for an extended period of time (say, 12 months) the monitoring schedule can be adjusted to reflect the actual operating conditions specific to the catchment. It is also recommended that the unit is inspected after every major storm event. One of the key advantages of the Ecosol™ Trash Rack is that it can be cleaned using a standard crane truck. This is safe and cost efficient.



4.0 Cleaning and Maintenance Procedures

One of the key advantages of the Ecosol™ Trash Rack is that it is a dry system and this reduces the likelihood of captured contaminants causing any significant adverse environmental impact or nuisance (e.g. odours and putrefaction).

Additionally the Ecosol™ Trash Rack consists of a stainless steel frame with support legs and a removable heavy-duty UV-stabilised polyethylene filtration net that can be easily lifted out for cleaning and maintenance using a small crane truck. This overcomes the problem usually encountered with traditional, fixed direct-screen designs, which are often difficult and expensive to clean. The steps to be followed to clean your Ecosol™ Trash Rack are detailed below.

Prior to cleaning day

It is important that, prior to commencing a clean, you confirm all plant and equipment is available and operational with service records and pre-start checklists available. It is also recommended that weather conditions for the day of the proposed clean be confirmed as the clean can only be completed in dry weather conditions. Ensure that you:

- Advise all concerned parties of the proposed date and time that the clean is to take place
- Ensure all necessary equipment is loaded
- Obtain approvals from the appropriate authorities
- Complete a safe work method statement for the work to be undertaken



4.0 Cleaning and Maintenance Procedures continued

Site establishment

- Review and amend as necessary and sign off the safe work method statement
- Ensure that the Ecosol™ Trash Rack to be cleaned is exposed and accessible
- Ensure that barricades and traffic controls, (if required), are provided at all working areas and that signs are in place to prevent injuries to public or staff
- Ensure all working areas are safe and all equipment is in place and ready for operation
- Commence recording cleaning data on the cleaning report provided



Cleaning Steps

- Position the crane truck adjacent to the unit to be cleaned. Ensure it is on level stable ground and appropriate signage is in place.
- Access the installed Trash Rack and connect your lifting shackle to the lifting lugs located on the top of the first filtration net frame
- Also connect the secondary lifting tether rope located at the outlet end of the filtration net. It is important both points are correctly tethered to ensure the unit is lifted evenly thereby avoiding damage to the unit guides and loss of capture pollutants during lifting
- Carefully commence lifting the full filtration net. Once free of all structures hold in suspension to drain any excess stormwater from the net.
- Lift the filtration net over the transport vehicle and lower to take the weight of the net. Release the cod-end clip at the outlet end of the net, and then lift the net to enable captured pollutants to fall from the base of the net.
- Once all pollutants have been emptied from the filtration net re-tighten the cod-end-clip
- Slowly position the filtration net and frame back into position.
- Once in position repeat the above procedure for all filtration net modules
- On completion inspect all of the filtration nets, stainless steel frames and general condition of the system to ensure all components are in good structural and operating condition.



4.0 Cleaning and Maintenance Procedures continued



Site demobilization

- Once all filtration nets have been cleaned load all plant, equipment and hand tools ensuring the site is restored to its original condition
- The crane truck must be packed up and ready to leave the site to dispose of all captured pollutants at an approved waste facility
- Complete the cleaning report accordingly

Please note:

It is recommended that the unit be cleaned at a minimum of once yearly and regularly inspected. Failure to regularly clean and maintain your Ecosol™ Trash Rack may invalidate the warranty and may reduce its performance efficiency. Should the Ecosol™ Trash Rack require any remedial works please contact your nearest Urban Asset Solutions Pty Ltd office.



5.0 Reporting

After each clean it is important that all cleaning data is recorded for use in ongoing asset management activities. A cleaning report should be prepared that details as a minimum the following information

- Site location
- Date and time of the clean
- Duration of the clean
- Volume or weight of material removed
- Composition of the captured material eg. sediment, vegetation and litter
- Details of any remedial work undertaken or required at a later stage

Reporting of the above information is included in the cost of any clean undertaken by Urban Asset Solutions Pty Ltd please refer to the next section for more details.



6.0 Monitoring, Cleaning and Maintenance Services

Urban Asset Solutions Pty Ltd has a very competitive cleaning service using a crane truck for the removal of all captured pollutants. After each clean we provide a full report detailing the volume and type of pollutants removed. We believe that it is in your best interests for Urban Asset Solutions Pty Ltd staff to clean and maintain the unit, not only because we are specialists, but also because proper monitoring and maintenance enhances the unit life significantly.

Urban Asset Solutions Pty Ltd has a dedicated Asset Management Division to help you not only determine how often your unit should be cleaned but also with the cleaning and maintenance itself. We offer:

- The use of high-performance equipment operated by experienced staff;
- A long-standing record in safe work practices, supported by Quality Assured processes
- In-depth knowledge and experience with all popular types and brands of GPTs;
- A complete understanding of pollution removal and disposal regulations and processes that ensures your unit is cleaned effectively and efficiently without risk of damage;
- Useful, easy-to-read reports, allowing you to track performance and pollution loading patterns.



7.0 Catchment Size and Recommended Cleaning Frequency

The Ecosol™ Trash Rack should be cleaned regularly. The cleaning frequency and the cost depend heavily on the surrounding environment, the unit's proximity to a waste facility, the number of units, their location, and the type of pollution collected. The figures in the table below give a broad guideline about the optimal catchment size and the number of cleans required annually based on typical expected pollutant loads.

Ecosol (Modular) Trash rack Product Code	Pipe and Culvert Dimensions	Gross Pollutant Holding Capacities	Optimal Catchment Area (Ha)	Recommended Cleaning Frequency
Cylindrical Pipes	mm	m ³	Ha	Per Annum
ETR 37	375	0.263	0.95	1
ETR 45	450	0.379	1.30	1
ETR 52	525	0.515	1.80	1
ETR 60	600	0.675	2.40	1
ETR 67	675	0.853	3.00	1
ETR 75	750	1.053	3.70	1
ETR 82	825	1.274	4.50	1
ETR 90	900	1.518	5.50	1
ETR 105	1050	2.065	7.50	1

Table 2 Indicative cleaning intervals for the Ecosol™ Trash Rack on cylindrical pipe outlets.

7.0 Catchment Size and Recommended Cleaning Frequency continued

Ecosol (Modular) Trash rack Product Code	Box Culverts Units (600mm wide)	Gross Pollutant Holding Capacities	Optimal Catchment Area (Ha)	Recommended Cleaning Frequency
Box Culverts	mm	m ³	Ha	Per Annum
ETR B37 6	375	0.421	0.15	1
ETR B45 6	450	0.505	1.80	1
ETR B52 6	525	0.589	2.10	1
ETR B60 6	600	0.675	2.40	1
ETR B75 6	750	0.843	3.00	1
ETR B82 6	825	0.927	3.30	1
ETR B90 6	900	1.012	3.60	1
ETR B120 6	1200	1.180	4.20	1

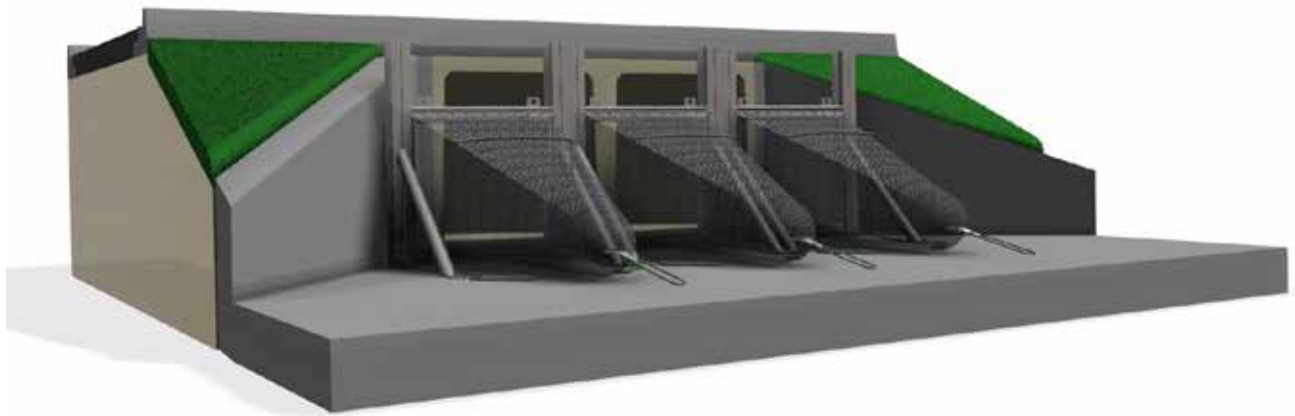
Table 3 Indicative cleaning intervals for the Ecosol™ Trash Rack installed on 600mm wide box culverts.

Ecosol (Modular) Trash rack Product Code	Box Culverts Units (900mm wide)	Gross Pollutant Holding Capacities	Optimal Catchment Area (Ha)	Recommended Cleaning Frequency
Box Culverts	mm	m ³	Ha	Per Annum
ETR B37 9	375	0.632	2.30	1
ETR B45 9	450	0.750	2.70	1
ETR B52 9	525	0.884	3.00	1
ETR B60 9	600	1.012	3.60	1
ETR B75 9	750	1.264	4.50	1
ETR B82 9	825	1.390	4.90	1
ETR B90 9	900	1.518	5.70	1

Table 4 Indicative cleaning intervals for the Ecosol™ Trash Rack installed on 900mm wide box culverts.

Cleaning frequencies are based on typical pollution loads of 0.280m³ /ha/year for gross pollutants generated on a typical fully developed urban catchment. Excludes coarse sediment pollutant loads.

All data provided in the above tables and figures are based on single module units with 2.5m net lengths. For multiple module units please consult with your local Urban Asset Solutions Pty Ltd representative



8.0 Warranty

The Ecosol™ Trash Rack is covered by a twelve-month warranty provided the unit is maintained and cleaned with the frequency, and using the method, recommended in this maintenance guide.

9.0 Life Expectancy

The Ecosol™ Trash Rack is designed to meet strict engineering guidelines and manufacturers guarantees. The stainless steel components have a life expectancy of 20 years while the filtration net has a life expectancy of 5 years.

10.0 Supplier and Technical Product Contact Details

For any maintenance or technical product enquiries please contact:

Urban Asset Solutions Pty Ltd

Tel: 1300 706 624

Fax: 1300 706 634

Email: info@urbanassetsolutions.com.au

11.0 Ecosol™ Trash Rack Cleaning and Maintenance Inspection Form

Asset Owner: _____ Asset ID: _____
 Unit Location : _____ UAS Ref: _____
 Date: _____ Time: _____ Product Code: Ecosol™ Trash Rack
 Inspected By: _____

Visual Inspection

Visual Inspection	Good	Fair	Damaged	Remarks
Condition of Filtration Net				
Condition of Cod-End				
Condition of Posts and Frames				
Fixings Condition				
Surrounding surfaces (Hardstands)				
Number Trash Rack Modules				
Module Size (per module)				
Estimated percentage of fill (average overall)				
Standing Water Level				

Comments

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