

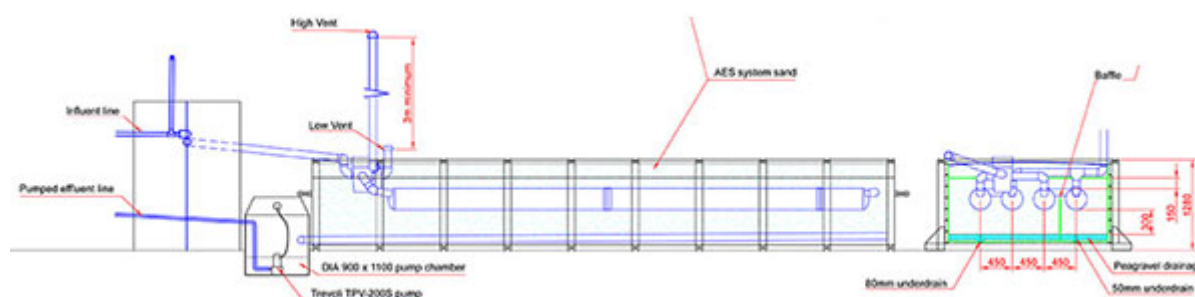
News June 2018

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OSET AS Built Layout



We provided this plan last month and we apologise for the low definition. Here is a link to a large-scale image of the lined bed AES-38 OSET Installation you can view here: [OSET-NTP AES-38 As Built Plan](#)

Ian Gunn's On-site NewZ Article: NZ Performance Testing – Gravelless Trench and Fabric/Textile Wrapped Distribution Pipe Treatment and Dispersal System

Ian is an on-site domestic wastewater management specialist, and editor of On-Site NewZ, an information service to the New Zealand on-site wastewater management industry.

Ian has recently written on his [On-Site NewZ blog](#) commenting on fabric/textile-wrapped pipes and the AES system specifically. Ian's article is reproduced here:

"In February 2013 On-Site NewZ posted an item entitled "Gravelless Trenches and Fabric/Textile Wrapped Distribution Pipes". The post introduced the topic as follows.

This technology associated with domestic wastewater septic tank effluent soakage trench systems has been around in the USA for many years, and recently entered the Australia and New Zealand market. Following an enquiry re the status of this system in the local context, On-

Site NewZ has prepared a review of gravelless trench effluent dispersal systems and added it to the Pages sidebar of this blog under the title of this post.

The issue that arose in the enquiry to On-Site NewZ was whether the wrapped pipe distribution technology was a “treatment and dispersal system” or just a “dispersal system”.

The associated review (9 February 2013) was prompted by the recent introduction into New Zealand of a proprietary system for dispersing septic tank effluent into the subsoil known as “Advanced Enviro-Septic” (AES) which originates in the USA. Basically the system comprises a patented geotextile plus plastic fibre wrapped large diameter (300mm) perforated and ridged plastic pipe laid within a “system sand” bed which disperses treated septic tank effluent into the subsoil.

The results of Canadian performance testing of the AES system carried out over 12 months in 2008 were set out in the review, and showed that the treatment accomplished through the textile wrapped distribution pipes and sand bed was better than 2.0 g/m³ cBOD and 2.0 g/m³ TSS with faecal coliforms at 218 cfu/100ml, effectively an “advanced secondary treatment” performance level.

Since 2013 Environment Technology (ET) of Nelson have designed and installed approaching 300 systems [now 450] throughout NZ. In 2016 ET installed an AES system at the Rotorua On-site Effluent Treatment National Testing Programme (OSET-NTP) facility. Testing under Trial 12 ran from October 2016 to July 2017. The AES Trial 12 OSET-NTP performance certificate of 23 March 2018 shows cBOD and TSS at less than 5 g/m³ over the evaluation period, confirming that the AES system in NZ can produce advanced secondary treatment effluent quality for dispersal into the subsoil from the treatment and distribution system.

Full details of the OSET-NTP testing results along with installation details of the tested system can be accessed from: www.environmenttechnology.co.nz/resources/oset-testing/

Ian has also written related articles which can be opened and downloaded by clicking on the links below:

[NOTES on AES \[ADVANCED ENVIRO-SEPTIC\] and ADVANCED SECONDARY TREATMENT PERFORMANCE](#) and
[GRAVELLESS TRENCHES and FABRIC/TEXTILE WRAPPED DISTRIBUTION PIPES](#)

For more information check out [OSET testing](#) or call us on 0800 927 834 (0800 waste H₂O).

Lined Bed AES installation

AES systems are usually installed with the treatment bed in an excavation in the receiving soil. In some conditions and situations however it may be required to be installed in a lined bed similar to that used at the OSET trials at Rotorua. Usually that is a bed excavated in the ground and then lined and not in an above-ground box as at OSET:

1. When the DLR of the receiving soil is less than 10mm/day such as Category 5 *Weakly Structured or Massive Light Clays* and in Category 6 soils. In this case the treated effluent

from the lined bed is drained to a siphon or pump chamber for disposal with pressure compensated drippers.

2. When there is a requirement to use the treated effluent for irrigation or other water reuse.
3. When there is a requirement for additional nitrogen / nutrient reduction which involves recirculating treated effluent and / or Tertiary treatment to remove potential pathogens.

Case Study

The owners of a 3 bedroom + office dwelling in the Tasman District were constrained by the resource management plan to a DIR of 2mm/d due to the clay soils, and were able to reuse their wastewater for landscaping irrigation on a relatively dry site. Reliability of this system using pressure compensated drippers required a minimum level of secondary treatment. An AES wastewater treatment system was selected, designed by Wastewater Design Ltd and installed by Laser Plumbing, both of Nelson.



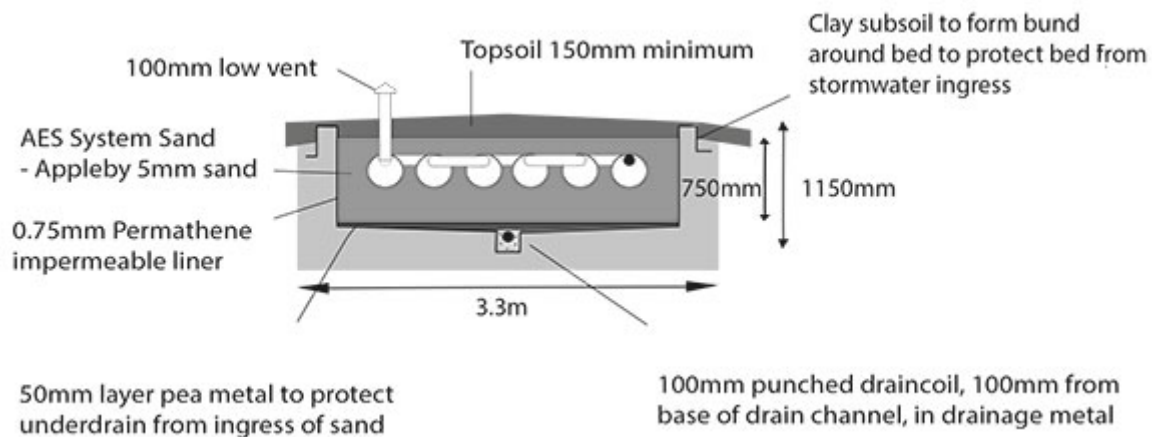
The AES lined bed system pumped to irrigate grasses and plantings provides an attractive feature in the landscaping of the section.

The Building Consent was in accordance with AS/NZS 1547:2012. The following design parameters were required by the resource consent conditions on the site and in others in general for the surrounding subdivision:

1. Assume soil Category 6.
2. The site was designated a Wastewater Management Area.
3. Maximum DIR 2mm/d as a consequence of the above zoning.
4. Disposal to land to be in the area shown in the resource consent (to the north and west of the building site and to be via pressure compensating drippers; drippers to be spaced at 0.6m centres and emitting no more than 1.6L/hr

The design included:

AES Bed – 6.6m x 3.3m; base area 21.8m²



The 7m long AES bed included 6 rows of AES pipes connected in series, installed in AES system sand. The sand under, around and over the pipes was sourced from a nearby supplier processing river gravels after previous testing confirmed PAP5 spec sand produced in that QA plant met the AES spec as system sand. Most local sands destined for concrete manufacture will comply. The bed lining was 500µ Polythene over Bidum A14 filter cloth to eliminate any risk of puncturing of the AES bed liner. The base of the bed was shaped to fall towards a 100mm DWV pipe with 4mm drilled holes at 4 and 8 o'clock installed over the central depression collecting the treated effluent falling to a pump chamber. A nominal 50mm thick layer of pea metal was provided between the base of the AES system sand and the round river gravel derived drainage metal surrounding the underdrain pipe laid on the polythene liner. This 6mm nominal pea metal was to prevent ingress of sand into the drainage metal surrounding the underdrain. The venting system of the AES bed was terminated using the house for support above the roof eave 3 metres vertically above the vent at the bed.

Pump Chamber – 1200L with high level alarm

The pump required a 1 bar or 10m head to open the pressure compensating drippers however parts of the disposal field are up to 5m above the pump. A Trevoli QDX1.5 submersible pump provided 55 litres/minute against this 15 metre head with 70 l/m flushing volume for additional velocity when required.

Disposal Field – 540m²

32mm LDPE header line fed a manifold splitting to 5 x 16mm dia. pressure compensating dripper lines. Each line has inlet isolation so that individual lines can be isolated for flushing and a similar valve at the line end for flushing. End valves were installed in a valve box with a mauve lid and marked with a ground treated peg.

Dripper line emitters were specified Unibioline 16010 CNL 1.6l/hr @ 0.6m centres.

[Click to view Design Drawings for this Lined Bed installation.](#)

[For more information about AES wastewater treatment systems visit the resources page on our website, watch the introductory videos, or call us on 0800 927 834 \(0800 waste H2O\).](#)



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