

Re Source Water solutions

P. O. Box 589

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Proposal 401

Wentzel Coetzer

Email: wentzel@work.co.bw

Dear Wentzel

Budget Proposal for onsite Sewage treatment for Bulk Waste Water Disposal at your Wilderness cottage project in the area Wilderness area

Thank you for inviting **Re Source Water solutions** to provide sewage treatment solutions for the above and we submit same herewith for your consideration.

Summary

The requirement is for the treatment of Domestic quality sewage that will be generated on the property by 4 people at peak.

With the Client provided information and our understanding, the peak hydraulic daily flow rate is estimated at $\pm 800L$ / day.

Treated discharge is to comply with the Department of Water and Sanitation's General Limit Standards, which allows it to be used for irrigation on the property or to be released back into the environment.

Sewage will gravity feed into the treatment plant and treated effluent will gravity feed away from the treatment plant.

The Plant comes standard with a friction chlorinator for final disinfection of the treated effluent. An optional chemical free UV sterilizer is available for final disinfection.

Proposal

We recommend for the conditions described above;

- 1) The installation of a **Clarus Fusion ZF450** Sewage Treatment Plant with a total hydraulic treatment capacity of 1 600L per day, Complete with Electrical control Panel, blower, inorganic screen and final sterilization.

RWS will supply, install and commission the items described above at your construction site in the Wilderness area for the period until the end of August 2023 for the price of:

1 x Clarus Fusion ZF450 Complete	
1 x Inorganic screen	

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1 x 75watt UV sterilizer chamber	
Installation Material	
Installation Labour	
Transport	
Total	

All civil and building works are not supplied by *RWS* and are usually supplied by your on-site building contractor.



Fusion installation at De Hoop Nature reserve

Clarus Fusion Preamble

Clarus Fusion® is a Japanese designed sewage treatment plant which is used extensively in Japan, the USA, and elsewhere, with an established and accepted

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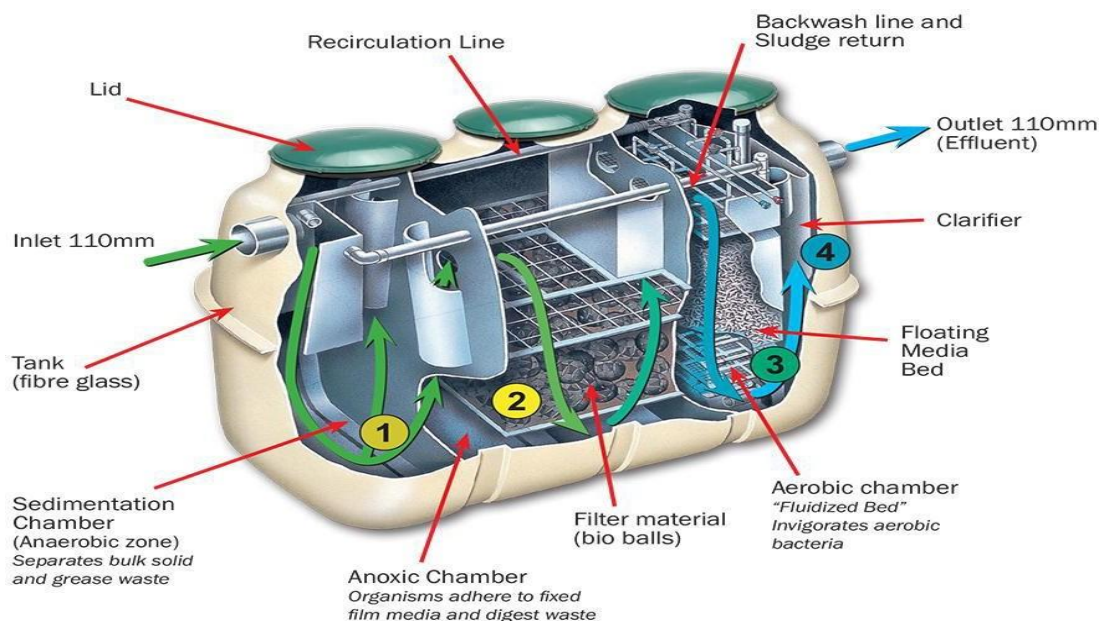
performance history perfectly suited to South African conditions. The plants are imported and factory assembled and tested locally, delivered to site ready for installation underground, with no site assembly required. This provides optimised nitrification and effluent quality to a standard that meets the requirements of the South African Department of Water Affairs and sanitation (DWS) for the release of such treated effluent back into the environment to meet the General Limit Values (GLV) in terms of Section 9 of the National Water Act No. 36 of 1998.

The units are characterised by exceptional performance standards through clever and superior design with very low installation and running costs. The **Clarus Fusion**® service concept is to design a system to satisfy client requirements depending on circumstances, and a suitable service protocol will be devised with Client to be formalised in a service contract to satisfy all the requirements.

Clarus Fusion Process

The process sequence promotes good nitrification, denitrification, and biological phosphate removal, with foreign solids removal at the head of the works and final disinfection available in an Ultra Violet lamp process or chlorine.

Interlinked stages in the process include anaerobic sedimentation settling, anoxic secondary settling, aerobic oxidation, final clarification, and disinfection, with electrical control monitoring of the system. Recirculation and backwashed sludge return via the bio ball filter material and floating media bed re-invigorates the bacterial action by returning circulation from the clarifier to the sedimentation chamber and backwashing from the aerobic bio-reactor to the primary settler.



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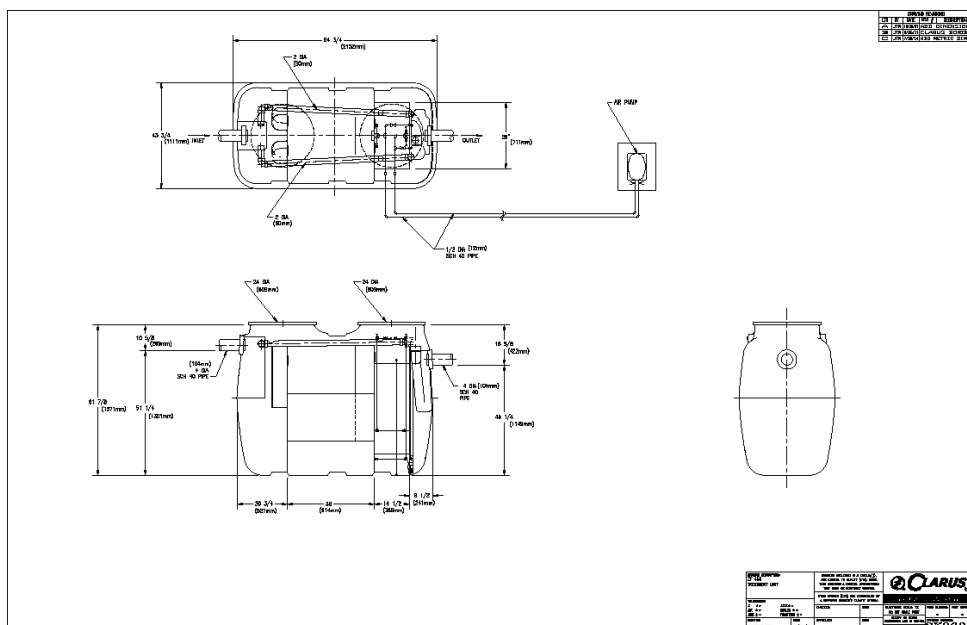
Major Clarus Fusion Client benefits

- Superior performance as evidenced in widespread usage in Japan, USA etc.
- Factory assembled and delivered to site for direct installation with no site assembly
- Installed underground integrating magnificently into the environment
- Compact and space efficient with minimal civil works required
- Fully enclosed slow and quiet process which minimises unpleasant odours
- Plentiful supply of oxygenation despite low power consumption
- Low running costs

Installation requirement

Fusion® Models	Treatment volume	Population equivalent	Length	Width	Height approx	Power required
	Litres per day	Based on 200Lpppd	mm	Mm	mm	Watts
ZF450	1600	8	2152	1200	1571	60

A 150mm reinforced concrete slab 500mm wider than the Plant all round, is required for the installation.



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Clarus Fusion® performance specifications

Influent: The project peak design loads for the influent is indicated to be normal Domestic sewage with estimated peak hydraulic flows less than **1600 litres per day**.

Clarus Fusion® design performance is based on normal domestic sewage which includes standard parameters as follows:

- pH at 25_C _6 and _9;
- Electrical conductivity not greater than 350mS/m at 25_C;
- Substances not in solution including fat, oil, and grease, waxes
o of mineral origin < 50 mg/l, of vegetable/animal origin < 200 mg/l;
- Chemical Oxygen Demand <600mg/l;
- Phenols 10mg/l;
- Anionic surface active agents 250mg/l;

Effluent: The effluent discharge is to conform to Water Affairs **General Limit Values** which include the normal parameters which small wastewater treatment plant performance is measured against. These include :

- Faecal Coliforms (per 100ml) 1000;
- Chemical Oxygen Demand (mg/l) 75;
- pH 5.5-9.5;
- Ammonia as Nitrogen (mg/l) 6;
- Nitrate as Nitrogen (mg/l) 15;
- Suspended Solids (mg/l) 25;

Operation and Maintenance

Operation and maintenance (O+M) is easy if undertaken by a trained and accredited Clarus Fusion Dealer. It is recommended that the Operation and Maintenance of the Clarus Fusion be done on a six monthly inspection service basis.

RWS will provide an Inspection Service 6 monthly consisting of detailed observation, diagnosis, adjustments, and report. These services include an accredited process to maintain performance levels, and to report thereon. Excluding warranty claims, the services do not include cost of spares, repairs, consumables, additional call-outs, 'honey-sucking', and testing of treated effluent, which is subject to invoicing. The services, as described, are provided for the sum of:

O + M	Price
6 Monthly Inspection service for 1 x Treatment Plant	

Pricing basis

RWS is in the business of providing solutions to purify effluent through the use of various

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technologies and whilst this might include supply, design, manufacture, site assembly, commissioning, and site servicing, operation and maintenance, we usually restrict our involvement to exclude client civils and building work on site. Consequently, we list hereunder the elements of work these prices include and exclude. We assume suitable site access and space for offloading and site storage, electrical power and that water is provided by the client, free of charge.

Price includes

Design and manufacture of the plant as described, off-site;
Indication of the necessary civil and building work required;
Delivery of the plant to site;
Connection of Client electrical supply cable to the Plant;
Commissioning
Defined costs involved in the on-going O+M regime as described;
Clarus Fusion® performance only if the operation and maintenance protocols have been adhered to, and the influent peak flow rate is within that stipulated in the design specification, as well as within the contamination criteria contained in this submission, with no biocides or other inhibiting elements having been allowed to enter the system.

Price excludes

All civil and building works;
Supply of Eskom power 220v (Single Phase);
Supply and installation of all electrical cable to the plant;
Supply and installation of all sumps, pumps and pipe work taking effluent to the plant;
Supply and installation of all sumps, pumps and pipe work taking treated effluent away from the plant;
Irrigation enablement;
Any site adornments, brownstone cover etc;
All costs involved in the on-going O+M regime (unless contracted to do so);

General conditions

Price excludes VAT

Products are imported from America and costs are linked to the R/US\$ exchange rate which for this proposal is between R18.00 and R19.00 / US\$.

Provision must be made for any future change in the exchange rate, which will apply at time of order and first payment invoice.

Payment terms include : 80% of price payable with order, 10% of price payable after delivery to site, and 10% payable on completion of installation and commissioning;

Delivery will commence within 4-6 weeks of receipt of firm order and payment;

Installation and commissioning will extend over a 1 week period after delivery to site, subject to timing of site readiness;

This proposal is valid for acceptance during a period of 30 days from the date hereof, beyond which we reserve the right to adjust terms and conditions if need be.

Guarantee

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All workmanship and materials are guaranteed for a period of 1 (one) year from Commissioning. *RWS* shall replace or repair any malfunctioning part during this period, free of charge, excluding damage or malfunction caused by negligence or malicious acts.

Jaco van der Spuy

10 July 2023