Kliptank Ltd.

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New Zealand

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KLIPTANK™

EFFLUENT SYSTEMS

INFORMATION HANDBOOK

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THE BEST TANK STORAGE SOLUTION

Kliptank Ltd is proud to be New Zealand's leading tank manufacturer for dairy effluent storage and treatment.

In 2007 we were the first to offer above ground effluent storage tanks to NZ Dairy Farmers and have gone on to sell over 500 tanks around the country.

Based in Tauranga, we employ over 25 staff and support more than 20 local suppliers for our

We are big believers in Kiwi Ingenuity and have developed our own unique product range to meet the needs of New Zealand Dairy Farms, including the patented Klipjet stirring and aeration system

NEW ZEALAND MADE

OVER 500 TANKS

KLIPTANK
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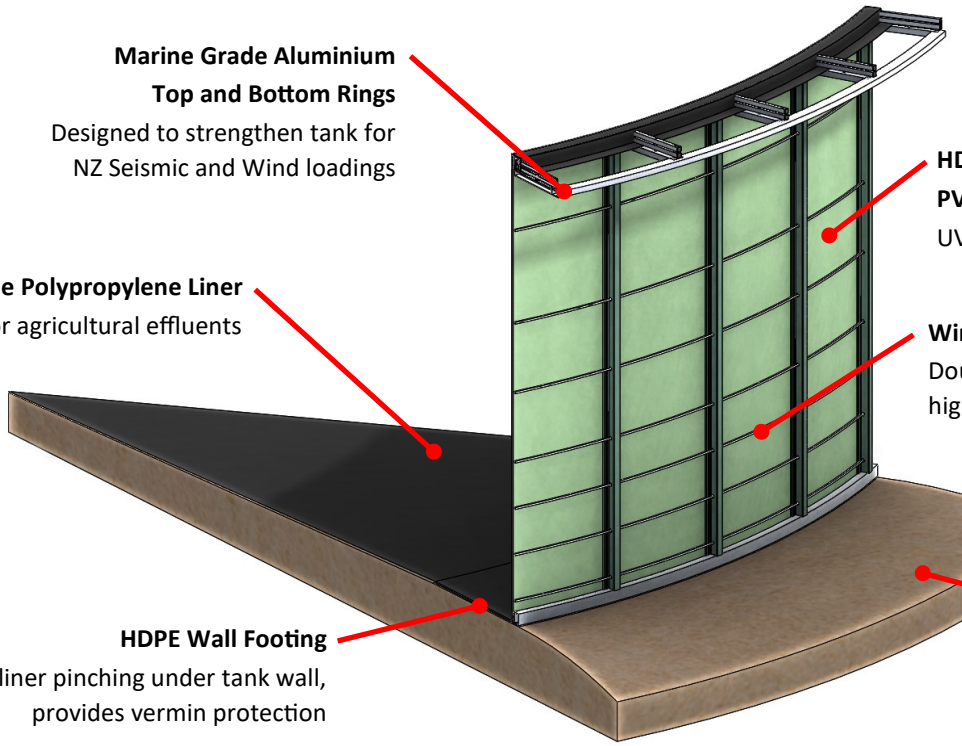
CONSTRUCTION MATERIALS



TECHNICAL DESIGN SPECIFICATIONS

Kliptank Limited have engaged Kirk Roberts Consulting Engineers for their design calculation and certification of the Kliptank product to meet NZ seismic & construction standards.

Kliptanks are designed based on the following:

- NZ Climatic & Seismic standards for wind, earthquake & rain
- **Importance Level** as defined in AS/NZS1170.0:2004
- Structural design loads are based on a 25, 50 or 100-year design life

Design has been made in accordance with the New Zealand Building Code Compliance documents:

- AS/NZS1170.0:2002 - Parts 1,2,3,4, & 5(Structural design actions)
- NZS3404:1997 (Steel Structures Standard),
- NZS3101:2006 (Concrete Structures Standard),
- NZS3106:2009 (Design of concrete structures for the storage of liquids)
- AS/NZS1665:2004 (Welding of Aluminium Structures)
- AS/NZS1554.1:2014 (Structural Steel Welding)

And specifically for Dairy Effluent Storage, Kliptank designs and constructs tanks in accordance with:

- **IPENZ Practice Note 21: Farm Diary Effluent Pond Design and Construction**
- All Regional and District Council rules and regulations for effluent storage across NZ

HOW MUCH STORAGE DO I NEED ?

THE DAIRY EFFLUENT STORAGE CALCULATOR (D.E.S.C)

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Massey University, in partnership with the Dairy Industry, has developed a free software tool for anyone to use to help calculate effluent storage size. From the Massey website:

"The 'Dairy Effluent Storage Calculator' (DESC) has been developed to account for the impact of factors affecting the quantity of storage required on a dairy farm to successfully practice FDE irrigation. The Calculator uses climate data to simulate the fluctuations in pond volume on a daily basis for the past thirty years. For each year it identifies the maximum quantity of FDE in the pond and hence the maximum storage capacity required to practice deferred irrigation that year; this value varies from year to year depending on climate. As an output, the Calculator states the maximum storage required over the thirty-year period. If the farm currently has ponds, this storage capacity is compared with the required value as predicted by the Calculator."

To download the DESC go to: http://flrc.massey.ac.nz/required/FDE%20Calculator/Obtain_DESC.html

The main factors driving the calculation are:

FACTOR	THINGS TO CONSIDER	KLIPTANK RECOMMENDS
RAINWATER 	Covered tanks keep out rainwater and reduce the storage size requirements, however they can easily become **anaerobic** if no oxygen is introduced into the system.	We only recommend covering tanks in areas where annual **rainfall exceeds 2000mm**.
SOIL RISK 	Farms with **high risk soils** have fewer days in the year when they can be irrigated and require a lot more effluent storage. For more information on soils check out the ***Pocket guide to determine soil risk for farm dairy effluent application*** on the DairyNZ website.	To reduce storage size, save **low risk soils** for irrigation during the wettest parts of the year. Low risk soils are roughly defined as land with slopes **less than 7º** that are naturally **free draining** (no artificial drainage).
CATCHMENTS 	**Uncovered feedpads** and other large concrete surfaces will catch a lot of rainwater, not only increasing the required storage volume, but also increasing the total amount of effluent and time to irrigate it.	To reduce the size of the effluent storage requirements on most farms, we recommend permanently **diverting rainwater** off the shed roof, and diverting all rainwater off the yard for periods when not milking.
IRRIGATION 	**High-rate irrigators** require a higher Soil Moisture Deficient before they can be used. This means waiting longer for the soil to dry out. Choosing to **not irrigate** at certain periods during the season (e.g. calving) and storing effluent instead will increase the required volume.	Using a **low-rate irrigation** system will allow you to irrigate more days of the year and therefore reduce the size of the tank required. Using **multiple irrigators** can sometimes reduce the storage size by providing a means to discharge more effluent per day.
WASH WATER 	The daily volume of wash water is the main factor driving the storage calculation. A conservative average value of **70 Litres per cow per day** is used when no actual measurements are available.	In reality most farms use less than this and measuring the exact water use (e.g. installing a **water meter**) will reduce the effluent storage size in most cases.

KLIPTANK PROCESS

Times stated are **working days** and based off averages from previous projects, subject to:

- Production queues
- Weather
- Resource consents etc.

Delivery dates are confirmed at time of order.

PLACE ORDER

ENGINEERING

5 days

Drawings and calculations required under the Building Code for seismic and wind loadings

MANUFACTURING

15 days

FREIGHT

5 days

BUILDING CONSENT

20 days

Kliptank handles the Building Consent with your local district council. From the application all the way through to code compliance.

SITE PREPARATION

2-4 days

Kliptank provide detailed instructions and it is the customers responsibility to organise the earthworks to prepare the foundation.

CONSTRUCTION

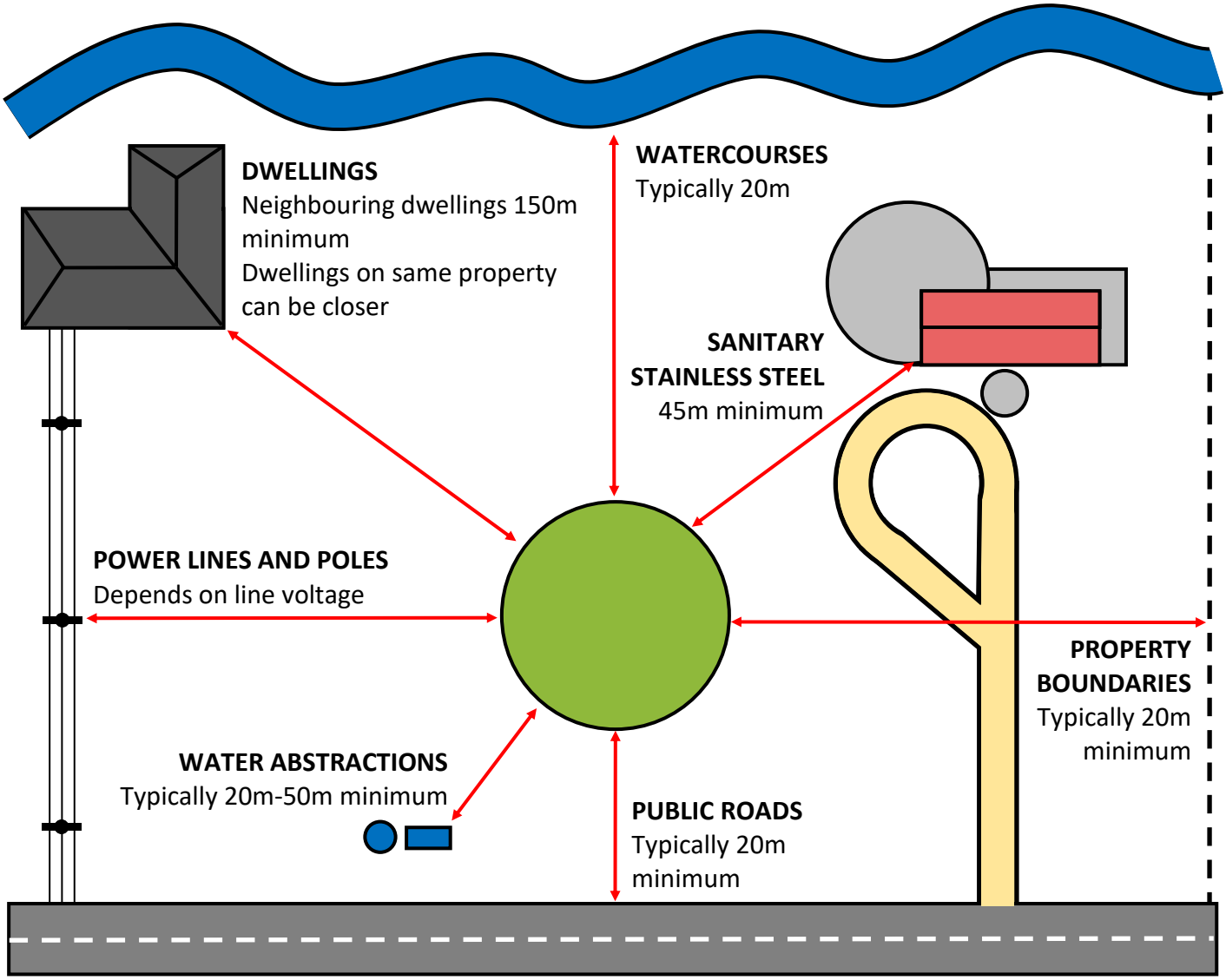
2-4 days

CONSENT SIGN OFF

Kliptank issue a PS4 and arrange for the Code Compliance Certificate

CHOOSING A SITE

SETBACK DISTANCES

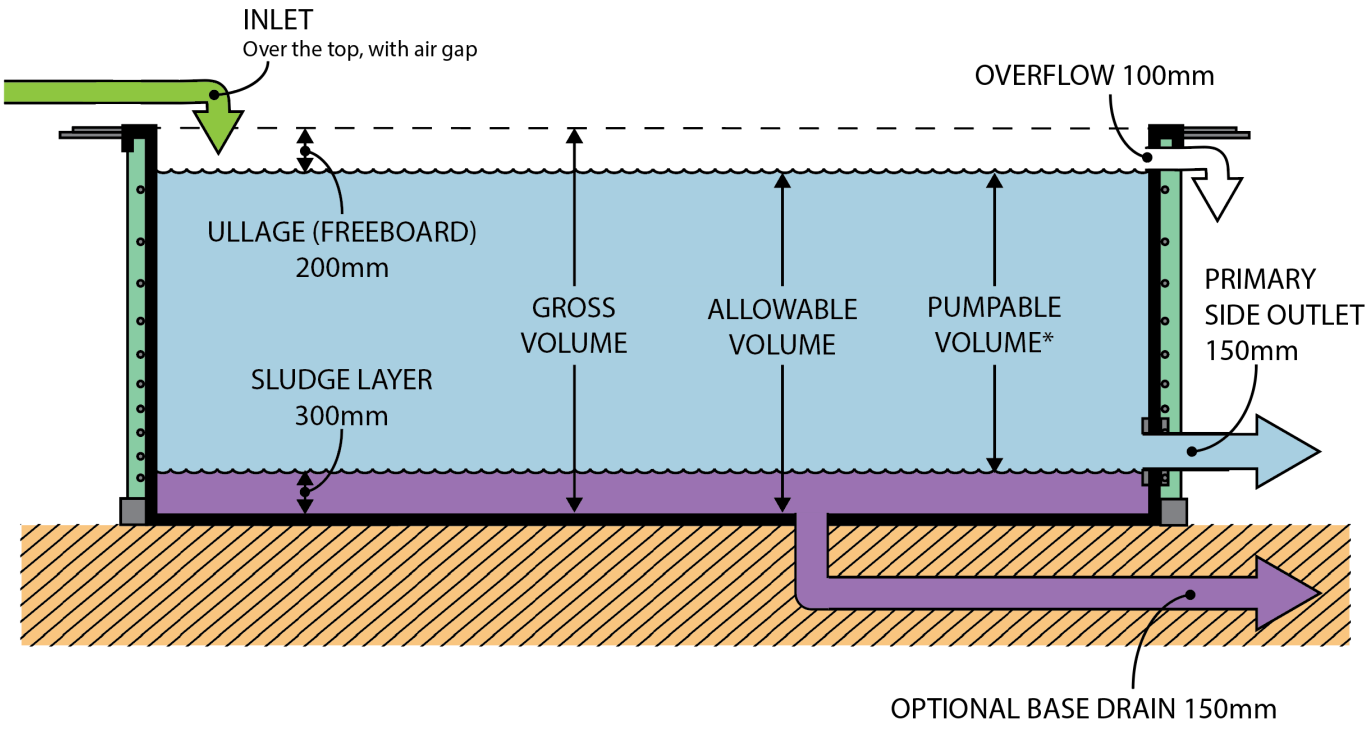


Setback distances are regulated by your local councils, MPI and utility operators. They can vary between different regions, so please check with your local authorities or Kliptank for more help.

Other site considerations:

- Prevailing Wind direction
- Natural and artificial drains
- Underground services, cables, pipes
- Tanker track
- Troughs
- Trees and leaf fall
- Fences
- Floodplains
- Soil type
- Level of fall for gravity drainage

KLIPTANK CONFIGURATION



GROSS VOLUME or **TOTAL VOLUME** is the figure used when describing the physical size of the tank.

ALLOWABLE VOLUME is the maximum amount of liquid allowed in the tank which the structural engineering calculations are based on. The overflow is designed so that liquid can not be filling above this level.

PUMPABLE VOLUME is the term used in the Dairy Effluent Storage Calculation. It is also the term people usually mean when talking about “required volume” or “storage capacity” in the context of Resource Consents etc.

SLUDGE LAYER is the amount of settled solids that are not regularly pumped out. The side outlet is designed so that the tank can never drain below 300mm. The weight of the remaining liquid provides a ground holding force for the liner underneath.

ULLAGE (FREEBOARD) is the allowance at the top of the tank to accommodate the height of waves generated by wind action. 200mm is enough to prevent any waves from sloshing over the sides, even in very high winds

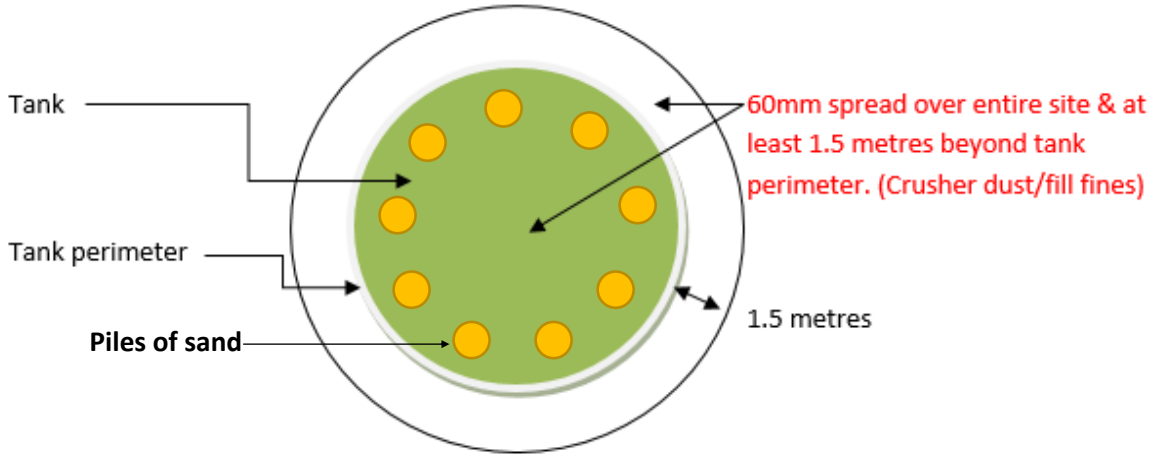
PRIMARY SIDE OUTLET is typically the point where effluent leaves the tank for irrigation. Standard size is 150mm, other sizes are available.

Example below shows a 150mm outlet with butterfly valve and PVC flange used to gravity feed back to a sump

OPTIONAL BASE DRAIN can be installed on any tank and is the best way to empty/clean a tank.

The example below shows a 150mm base drain with a riser, butterfly valve and lever-lock connection so that a sucker truck can connect easily.

SITE PREPARATION

1	To meet engineering specifications, **ALL TOPSOIL MUST BE REMOVED** prior to the placement of any base materials
2	The tank site/pad **MUST** be at least 1.5 metres larger in diameter than the tank itself
3	The site **MUST BE LEVEL** around the entire tank perimeter. THIS IS EXTREMELY IMPORTANT
4	The site must have crusher dust/fill fines **FREE OF STONES AND SHARP DEBRIS**, spread to a depth of 60mm over the entire site extending beyond the tank perimeter by at least 1.5 metres. **COMPACT THIS PREPARATION TO 30kPa**
5	Place additional crusher dust/fines inside the tank perimeter in separate piles (1 wheel barrow per 2 metres) 
6	For the optional base drain, a trench must be dug 500mm deep and 200mm wide before the tank installation starts.  The picture above is an example of a base drain trench being dug on a foundation for a flat farm that had to raise the pad to gravity feed back to the sump.
7	After the tank is installed, GAP 20-40 or similar gravel must be placed around the tank perimeter to prevent the base from being eroded by rain water running down the sides of the tank.

INSTALLATION

Flat Packed to Site

Base Down

Walls Up

Liner Ready

...and Rolled Out

Install Complete

FREQUENTLY ASKED QUESTIONS

Why do I need a Building Consent?

Any structure over 1.2m high or holding more than 30,000L needs a Building Consent under the NZ Building Code. This process ensures a certified engineer signs off the tank design and does the site-specific structural calculations for seismic, wind and snow loadings.

Can I have extra inlets/outlets?

Yes. We can configure as many ports on the tank as you like and make them any size and type. Please ask us for more information.

Can I gravity back to my sump?

Absolutely, we have solutions to control the flow back in the sump to stop it overflowing or running dry.

Who can do my site preparation?

Either yourself or a local contractor. We will send detailed instructions to make the process as easy as possible.

Who connects my pipework?

Either yourself or your local contractors/pump agents. We will work together with all other parties from the start to make sure everything is done right.

Can I install a Kliptank myself?

No. There are some special tools and training required to install a Kliptank properly. We also have a Quality Assurance process which requires checking of certain processes during the install which are a necessity to provide the warranty.

What's the warranty?

15 years on the Kliptank, including a special manufacturer's warranty on the liner of 15 years.

Where is my tank coming from?

The tank will be sent out from the Kliptank factory in Tauranga the week before construction and the freight company will call you to organise delivery.

Can they be moved?

Yes. We move our tanks all the time—it's a quick and easy process. If planning on moving a Kliptank we highly recommend installing a base drain to help clean and empty the tank.

Can they be resold?

Yes. We have our tanks in situations where they are only needed temporarily and can be resold within the warranty period.

How can I find out more?

Please check our website for more information or call us toll free on 0800 255 222 and take advantage of a FREE on-farm consultation.