DETAIL INSTALASI PENGOLAHAN AIR LIMBAH SISTEM SETEMPAT (On site system 2)
CARE Sanitation Model

Grey Water → Control Box → Septic Tank → Wetland → Banana Circle

Black Water
CARE Septic Tanks

Black Water

Septic Tank

Tanks

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CARE Septic Tanks

Fiberglass Septic Tanks

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Fiberglass Septic Tanks

- Fiberglass Tanks are being used only where there is a problem of high water table
- Fiberglass Tanks are used in places where there is lack of space
- Three sizes are used depending on the available land- 1500 L, 1000 L and 850 L
- The Largest appropriate size is being used
Fiberglass Septic Tank 1500 L

- Pre-fabricated
- Its water tight
- Locally Made (Aceh)
- De-Sludging interval: 2 Y
- Cost of Tank: Rp 1.7 m.
- Installation Cost: Rp.350,000
- Large Tank, Less durable
Fiberglass Septic Tank 1000 L

- Pre-fabricated, Factory made
- Its water tight
- Procured from Medan
- De-Sludging interval: 1 Y
- Cost of Tank: Rp 1.5 m
- Installation Cost: Rp 350,000
- Very Strong tank, Capsule Shape, Highly Compacted
Fiberglass Septic Tank 850 L

- Pre-fabricated
- It's water tight
- Locally Made (Aceh)
- De-Sludging interval: 1 Y
- Cost of Tank: Rp. 1.0 m
- Installation Cost: Rp. 300,000

Small Tank, Frequent De-sludging
Common Advantages

- Lower Cost compared to Concrete Tanks
- Ready and Easy to install
- Fastest installation time- it just takes 30 minutes (If the pit is ready!!)
- Waterproof almost guaranteed
- Can be made according to required specifications
- Less space required
- Can be repaired on site
Common Problems

- Can be damaged in transport
- Community acceptance - low (unfamiliar technology)
- Floatation of tank during sludge removal
How to Install

- Digging of appropriate size pit
- A minimum of 15 cm of sand bedding
- The pit should be free of rocks/ stones
- Place the tank in the pit, allowing 2% slope from black water outlet
- Fill the tank with water, backfill the pit and Compacted
- Area around the tank to be backfilled to prevent flooding around the tank
- A large Concrete slab can be constructed to prevent it from floating if necessary

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Factors influencing the selection of the Location for Septic Tank Installation

- Availability of land
- Shape of the available land
- Availability of drainage
- Location of shallow water well
- House owners preferences
- Neighbors interests
- Accessibility for de-sludging
- Minimum length and minimum bends between latrine and septic tank
Twin Fiberglass Septic Tanks

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Excavation in Rocky area

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Septic Tank after 6 months of Installation

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Sanitation system after 6 months

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Sanitation system in a Puskesmas
Used for a settlement of 109 houses in a densely populated community. High ground water table. Tank is feed with Grey and Black Water. The Outflow is further treated in a leachfield.
Schematic overview of the Design

- Two chamber system
- All necessary pipes pre installed
## Different Sizes

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Construction Issues

Support for Local Governance for Sustainable Reconstruction in Aceh
PREP Criteria

1. Septic Tank ‘Un-naturally Full’
   • Over capacity
   • Infiltration is blocked
   • No infiltration present

2. Pan Full
   • Improper hydraulic gradient from WC to Septic Tank
   • Blockages – tissue & sanitary towels

3. Sanitation System / Pipeline broken or leaking
   • Structural cracks in structure
   • Broken piping
   • Ponding of effluent in sanitation area
Case Studies – Field Experiences
Location: Blang Tue Orphanage, Lhokseumawe

Septic Tank – Over Capacity and Cin Cin Leaking

Before

2 Cin Cin’s
(No Secondary Treatment)
Implementation Activities – Hard

Conventional Septic Tank Sized for 100 Persons

Excavations for Septic Tank

Excavations for Infiltration
Implementation Activities – Soft

Boiling Water Competition

Joint Monitoring Form (Oxfam & Community)

Safe Water Chain Discussions
Case Studies – Field Experiences Cont.

Location: Communal Latrines, Near to Menasa, Pulo Tukoh, Sigli

Unsealed Cin Cin’s located near fish ponds, resulting in 2 sources of water filling the cin cin:

- WC Effluent
- Fish pond / groundwater

WC Effluent Overflowing through broken vent pipe
Practical Way Forward – Next Steps Planned

Decommission Cin Cin’s

Control Box

Septic Tank

Secondary Treatment
Case Studies – Field Experiences Cont.

Location: Family Latrine, Jambo Massi, Lamno

2nd Cin Cin (dormant) not connected to 1st Cin Cin

Vent pipe only on 2nd cin cin

PVC uncovered
Case Studies – Field Experiences Cont.

Location: Krueng Mate Orphanage, Lhokseumawe

Problem
Septic tank leaking regularly at surface.
After desludging the septic tank, inspected inside and realised the baffle wall is the wrong way round.

Solution
Isolate 1st chamber and renew baffle wall
Enlarge secondary treatment
Case Studies – Field Experiences Cont.

Location: Communal Latrine, Bintang Hu, Sigli

Problem
Cin cin’s leaking – combination of ‘un-naturally’ full and capacity

Solution
Replace septic tank and secondary treatment. Design to be advised post inspection of groundwater – either pre cast or cast insitu
Cin cin adaptations + Plastic tank problems

Cin cin
Plastic tanks
Oxfam's Aceh Besar’s solutions
Cast concrete / Biofil
“Typical Oxfam working locations in the urban environment”
Solution?

- Biofil..
Solution?

- Drainage programme
Biofil Issues..

1. Uplift. The standard Biofil design will float when desludged. Oxfam has worked with Biofil and modified the design to remove the problems of uplift and improve the access for operation and maintenance.

Uplift – This problem will occur for all tanks whether they are plastic, fibre glass or concrete. If weight of the tanks when empty is less than the weigh of water it displaces it will float like a boat… This situation will exist when the tank needs to be emptied.
BF O6 (M) Modifications
Uplift

- Therefore the modifications allow us to anchor the septic tank with mass concrete.
“Rocker pipes”
Biofil Steel cover design
High Ground water installation BF 06 (M)
Sludge Removal at village level

Simple hand pump made of locally available materials

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VLOM

Village Level

Operation & Maintenance
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Sludge Removal at village level

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Contoh Penanganan Lumpur Tangki Septik di daerah Pedesaan
Permasalahan:

- Lokasi sangat terpencil
- Mobil tinja tidak dapat mencapai lokasi
- Tidak terdapat mobil tinja
- Tidak ekonomis, bila hanya melayani areal perumahan yang kepadatannya rendah
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Sludge Treatment at village level

Combine with solid waste collection

Small entrepreneur to set up composting

Local organizations like PusKesMas
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Sludge Treatment at village level

Simple drying container with drain

Tangki Pengering Lumpur
Lumpur tinja yang telah mengering
Lumpur tinja yang telah mengering secara manual di pindahkan
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Sludge Removal at village level

Simple hand pump made of locally available materials
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