

Sultanate of Oman

Ministry of Regional Municipalities and Environment

**Ministerial Decision Number 421 / 98
Dated 30th November 1998**

**Regulations for Septic Tanks,
Soakaway Pits and Holding Tanks**

Unofficial Translation

Ministerial Decision Number 421 / 98
Issuing the Regulations for Septic Tanks,
Soakaway Pits and Holding Tanks

- According to the “Law on Conservation of Environment and Prevention of Pollution” issued by Royal Decree Number 10/82 and its Amendments;
- and Ministerial Decision Number 5/86 “Regulations for Septic Tanks and Holding Tanks”;
- and in the requirements of the public interest.

Has Decided that

- Article 1.** The provisions of the following Regulations concerning Septic Tanks, Soakaway Pits and Holding Tanks shall come into effect.
- Article 2.** The “Regulations for Septic Tanks and Holding Tanks” issued by previous Ministerial Decision Number 5/86 and all those contradicting with this Decision or contravening its provisions shall be considered void.
- Article 3.** This Decision shall be published in the Official Gazette and shall come into force with effect from the Date of Publication.

His Excellency, Dr. Khamis bin Mubarak bin Essa Al-Alawi
Minister of Regional Municipalities and Environment

Issued on this 11th day of Sha’aban 1419 H.
(Corresponding to 30th November 1998)

Regulation for Septic Tanks, Soakaway Pits and Holding Tanks

Objective

Article 1. In compliance with the Law on the Conservation of Environment and Prevention of Pollution issued by Royal Decree Number 10/82 and its Amendments, and in order to protect the land and water resources from pollution, and to achieve proper health standards, these Regulations concerning Septic Tanks, Soakaway Pits and Holding Tanks have been effected.

Definitions

Article 2. The terms used in these Regulations shall be as defined by the Law on the Conservation of the Environment and Prevention of Pollution and its Amendments, with the following additions:

Septic Tank:- Means any structure designed to treat domestic wastewater by compartmentalised sedimentation and anaerobic biological degradation.

Holding Tank:- Means any structure to hold the wastewater without any leak, seepage or overflow into the surrounding environment.

Soakaway Pit:- Means any pit or any other underground construction designed for seepage of the treated wastewater into the ground by infiltration or percolation.

Domestic Wastewater:- Means the effluent, including settleable materials (sludge) and scum discharged from water closets, ablutions, kitchens...etc, of houses and institutions.

Institutions:- Means public or private premises such as schools, colleges and offices and excluding industrial buildings or hospitals.

Population Equivalent:- The estimated number of a population that would discharge domestic wastewater of total organic load equivalent to that of a particular non-domestic wastewater effluent discharge.

For design purposes, the population equivalent shall be calculated by dividing the daily BOD load (in grams) by 60; or the daily volume thereof (in liters) by 180 and it shall be taken that the population equivalent is the larger of the two figures so calculated.

Daily Biochemical Oxygen Load (BOD):- Means the oxygen demand imposed by organic carbonaceous and nitrogenous materials in the wastewater. This is taken as being 60 grams per capita per day.

Provisions for Septic Tanks

Article 3. Septic Tanks shall only be allowed in institutions and accommodations which discharge solely domestic wastewater from population equivalents not greater than 150. Any larger institutions must be served by sewage treatment plants subject to the “Regulations for Wastewater Re-use and Discharge” of Ministerial Decision Number 145 / 93.

Article 4. Septic Tanks may only be installed with the prior approval and consent of the concerned Municipality and that shall only be given in case of lack of a public sewer system for such discharges.

Article 5. Septic Tank capacity must be calculated according to the procedures set out in Annex A of these Regulations and must be designed according to the criteria given in Annex B of these Regulations.

Article 6. Soakaway Pit systems must be designed and based on ground percolation tests carried out by the owner at his own expense under the supervision of the concerned Municipality as described in Annex C of these Regulations.

If the ground nature, hydrogeological conditions, percolation tests and population density so allow, the wastewater from the septic tanks may be discharged into appropriately designed and constructed soakaway pits or to a permeable underground construction approved by the concerned authorities.

If such conditions are not suitable, then the wastewater from septic tanks must be discharged into holding tanks which must be constructed and installed according to Annex D of these Regulations

Article 7. Septic tanks must be constructed in such manner, and using appropriate materials, as to ensure that they remain watertight at all times.

Article 8. Septic Tanks must always be maintained in a fully functional condition.

Article 9. Sludge accumulated in septic tanks must be periodically removed whenever necessary. Disposal must be in a manner approved by the concerned Municipality and relevant authorities.

Article 10. Septic Tanks and Soakaway Pits must comply with the following conditions:

- a) Always be constructed on land within the legal control of the owner of the premises, or on land designated by the concerned Municipality in coordination with other relevant authorities.
- b) Be located at least 100 meters away from any public water supply sources, wells and aflaj and at least 30 meters away from private wells. The concerned Municipality, in coordination and consultation with the relevant authorities, and depending on local conditions, may vary these distances.

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- c) Be located at least 3 meters away from any wall of an occupied building, water pipe or mature trees. The concerned Municipality, in coordination with the relevant authorities, may determine any variation to this distance with the condition that it shall not be less than two meters.
- d) The uppermost water level of the septic tank shall not exceed the levels of any nearby well heads and also be such that the pollutants cannot reach those wells. Septic tanks must also be sited in an appropriate position so as to facilitate future connection when a public sewer becomes available.
- e) Be sited in a position where they can be accessed and served by wastewater tanker vehicles, in any event not at a distance greater than 20 meters from the nearest available service point.
- f) Be located at least 30 meters from excavation and filling sites.

Provisions for Holding Tanks

Article 11. Holding tanks shall only be installed with the approval of the concerned Municipality and must be designed according to the criteria given in Annex D of these Regulations

Article 12. The wastewater from holding tanks must be transported by wastewater tankers to a place approved by the concerned Municipality and relevant authorities at such intervals as will ensure there is no overflow of wastewater at any time from the holding tanks.

Article 13. Holding tanks must be constructed in such manner, using appropriate materials, as to ensure that they remain watertight and also comply with the following conditions:

- a) Always be constructed on land within the legal control of the owner of the premises, or on land designated by the concerned Municipality in coordination with other relevant authorities.
- b) Be located at least 15 meters away from any water source and in such position that any wastewater overflow or spillage cannot reach such water source.
- c) Be located at least 1.5 meters away from any wall of an occupied building.
- d) Their uppermost water level shall not exceed the levels of any nearby well heads and also be such that the pollutants cannot reach those wells. Holding tanks must also be sited in an appropriate position so as to facilitate future connection when a public sewer becomes available.
- e) Be sited in a position where they can be accessed and served by wastewater tanker vehicles, and in any event not at a distance greater than 20 meters from the nearest service point.

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Article 14. In application of the provisions of these Regulations in difficult terrain, local conditions such as mountainous areas and rocky or hard ground may be considered and the concerned Municipality shall then handle such cases as necessary, on an individual basis only, in coordination with other concerned authorities.

ANNEX A

Calculation of Septic Tank Capacity

The capacity of a septic tank is defined as, and based on, the volume of the wastewater (including sludge and scum) it is capable of retaining during its normal, operating mode and conditions.

For houses:-

The septic tank capacity is calculated on the basis that it shall provide a minimum of 240 liters capacity per person with the condition that the total capacity of the septic tank shall not be less than 2000 liters.

For institutions:-

The septic tank capacity is calculated in the same manner to the calculation of that for houses. The number of persons shall be calculated from the population equivalent of the institution with the condition that the larger of the two derived figures must be used (see definitions) and that the total capacity must also not be less than 2000 liters.

ANNEX (B)

Septic Tank Design and Measurements Criteria

1. The capacity shall be calculated according to Annex A of these Regulations.
2. The septic tank will normally be rectangular and the length of the tank must not be less than three times, and not more than four times, its width. The water depth of the tank shall not be less than 1.2 meters for tanks serving up to 10 persons, and not less than 1.5 meters for tanks serving more than 10 persons. In special circumstances alternative shapes of tank may be accepted at the discretion of the concerned Municipality.
3. The septic tank must have at least two compartments. The compartment into which the wastewater feeds must have twice the capacity of that from which the septic tank effluent discharges. Alternative designs may be acceptable at the discretion of the concerned Municipality.
4. Compartments must be interconnected by means of circular holes of 150mm nominal diameter or by square or rectangular slot(s) of 100mm height, the tops of all connections must not be less than 300mm below the top water level. The horizontal distance between all connections must be 300mm center to center.
5. There must be two tanks operating in parallel when the contributing population equivalent exceeds 100 persons. Each tank must be capable of operating in isolation from the other. Each tank must have not less than half of the capacity calculated according to Annex A of these Regulations.
6. The tank floor maybe flat but for larger tanks a floor slope of 1 in 4 is preferable.
7. The inlet to the tank must consist of a single “T” shaped dip pipe for tanks not wider than 1.2 meters. For tanks wider than 1.2 meters there must be two such inlets set at a distance of one quarter the tank width from their adjacent side walls.
8. The inlet pipe(s) diameter must not be less than the diameter of the incoming sewer. The upper limb must rise 150mm above the top water level and the bottom limb must extend 450mm below the top water level.
9. The outlet of a tank less than 1.2 meters wide must consist of a single “T” shaped dip pipe of 100mm nominal internal diameter set at a level 25mm below the tank inlet level.
10. For tanks wider than 1.2 meters, a full width outlet weir must be provided and be fitted with a full width steel weir plate set at a distance of 200mm in front of the weir to hold scum within the tank. The apex of the weir must be 150mm above the top water level and the bottom 600mm below the top water level. The weir plate must be corrosion proof(ed).

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11. In septic tanks fitted with such a weir, a full width, corrosion proof(ed) deflector of 200mm thickness must be fitted on the internal wall 150mm below the bottom of the weir to hold back suspended solids.
12. Drawings of typical septic tanks are given in Annexes E and F of these Regulations..
13. Septic tanks must be constructed from reinforced concrete or of such other materials in accordance with Article 7 of these Regulations. Septic tank construction and installation must be strong enough to withstand heavy loads such as cars and trucks.
14. Septic tanks must be provided with openings not less than 600mm in dimension to permit easy access to tank inlet, connecting holes, sludge and scum boards, and must be provided with sealed covers of heavy duty type so as not to allow the escape of air. The openings and covers must also be approved by the concerned Municipality.
15. Septic tanks must be provided with a ventilation pipe of 100mm nominal diameter to a height not less than one meter above the roof of adjoining buildings, or the eaves where such buildings have pitched roofs on condition that:
 - a) No ventilation pipe may be fixed or located so as to prevent the escape of any foul air into the building.
 - b) The open end of any ventilation pipe must be provided with suitable mesh cover so as to prevent entry of adventitious matter whilst also not impeding air flow.
 - c) Ventilating pipes shall be straight except where this unavoidable and specially approved by the concerned Municipality.
 - d) Ventilation pipes shall not be used for carrying rain water drainage.

ANNEX C

Procedure for Percolation Test and Soakaway Pit Design

Percolation Test

To determine the area of land required for the Soakaway Pit, the following test must be carried out:-

Level the ground and then excavate a hole measuring 300 x 300 millimeters and 600 millimeters deep. Fill it with water and allow all the water to seep away. Refill the hole with water to a depth of at least 300 millimeters and measure the time in minutes for this water to again seep away completely.

Divide the time in minutes by the depth in millimeters of water placed in the hole on the second occasion. The result is the average time taken for the water depth to drop one millimeter. The effective absorption / soakaway area can then be calculated from the following table.

Absorption Areas Required for Soakaway

Time for Test Water To fall 25mm (minutes)	Effective Absorption / Soakaway Area Required (square meters) per person	
	Houses	Institutions
2 (or less)	1.8	0.5
3	1.2	0.6
4	2.4	0.7
5	2.8	0.8
10	3.7	0.9
15	4.6	1.2
30	6.3	1.7
60	8.4	2.2

The above figures give the net absorption / soakaway area required measured as peripheral wall and base area of the soakaway pit.

- NOTE:
- a) Carry out the test at least three times and take the average figure.
 - b) The soakaway pit should consist of an excavation filled with brickbats or other large pieces of special material, or unfilled but lined with dry laid brickwork or pre-cast concrete (porous or perforated) rings, from which the effluent may percolate into the surrounding ground. The pit should be covered by a slab with manhole. A drawing of a typical soakaway pit is given in Annex G) of these Regulations

ANNEX (D)

Holding Tanks Design and Measurements Criteria

1. In any event, holding tanks capacity must provide a minimum of three days storage with the condition that the capacity shall not be less than 3000 liters. In calculations for capacity, 240 liters of tank volume must be allowed for each person contributing to the sewage discharging to the holding tank.
2. The holding tank shall normally be rectangular. In special circumstances alternative shapes may be acceptable at the discretion of the concerned Municipality.
3. The nominal water depth of the tank must not be less than 1.5 meters and not more than 2.0 meters.
4. There must be two tanks operating in parallel when the contributing population exceeds 100 persons. Each tank must be capable of isolation from the other. Each such tank must also have at least half the capacity calculated according to item 1 of this Annex.
5. The tank floor must have a slope of 1 in 4 down to the suction side and have a sump 600 x 600 x 300mm deep under the opening provided for installing the suction pipe so as to facilitate complete emptying of the tank contents.
6. Holding tanks must be of reinforced concrete or other materials in accordance with the requirements Article 13 of these Regulations and should be strong enough to withstand heavy loads such as cars and trucks.
7. The openings to the tank must not be less than 600 x 600 millimeters in dimension and must be provided with sealed covers of heavy duty type so as not to allow the escape of odours and must be approved by the concerned Municipality.
8. Ventilation:- All holding tanks must be provided with a ventilation pipe in accordance with the measurements set forth in Item 15 of Annex B of these Regulations. A drawing of a typical holding tank is given in Annex H.