Wastewater Control and Management

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Water & Wastewater

Water

- Demand (MNBC 2025)- 5D
- Disposed Point
  - Flood (Drainage System)
  - Creek , River , Public Drain,…..

MNBC 2025)- 5D

- 5D.2.1.93 Potable Water
- 5D.3.1.16 Fixture for Disabled
- 5D.4.1.2 Water Supply for Building Other than Residences

Water & Waste Water

Wastewater

- 80% or 90% Water Demand
- Systematically Dispose (Treated Water)
- BOD/COD/TSS
  - BOD – 20mg/l ,COD – 60mg/l, TSS – 30mg/l (Controlled WC)
  - BOD – 50mg/l ,COD – 70mg/l, TSS – 50mg/l (UnControlled WC)

MNBC 2025)- 5D

- 5D.5.3 Materials , Fittings and Appliances
- 5D.5.4.3 Other Method of Disposal of Sewage
- 5D.6 Solid Waste Management

Wastewater

Wastewater (2 Nos)

(1) Black Water

(2) Grey Water

(1) Black Water (12 – 15 gal/day)

- Scum (Oil & Grease)
- Liquid (Dissolved Solid)
- Suspended Solid (Settled)

(2)Grey Water (Kitchen Waste)

- Oil & Grease
- Piece of Meat & Vegetable
- Detergent

➢ Calculate Septic Tank Size

Pre-sedimentation & Aeration

Wastewater Treatment System

Wastewater Treatment System

(1) Aerobic System

(2) Anaerobic System

(1) Aerobic System (Need Oxygen)

- Sludge

- Treated Water

(2) Anaerobic System (No Need Oxygen)

- CH_4 (Waste to Energy)

Wastewater Treatment System Process

- Need Oxygen (Aerator , Diffuser, Compressor ,…..etc)
- Need Living Space (Media, Bio-Film, Membrane, Jel ,….etc)
- Treatment (Separate by Solid & Liquid)

Reuse

- Solid (Sludge)

(Compositing , Landfilling , Fertilizer, Ash for construction material)

- Liquid (Treated Water)

(Agriculture Farm, Gardening, Green-House Farming)

Before Wastewater Treatment

- Auto Bar Screen / Inclined Bar Screen

(Removal of Solid Waste)

- Grit Separator (Chamber)

(Removal of Sand , Piece of gravel)

- Grease Trap (Treated Water)

(Removal of Oil & grease)

- Solid Trap

(Removal of small solid)

Black Water Treatment (Wastewater Treatment)

- Sedimentation (to settle solid) (Primary)

- Aeration (to digest organism)

- Sedimentation (to settle settleable solid) (Secondary)

- Chlorination (to dispose control water area)

- this process ‘ Activated Sludge Process ’(Convention , Extended)

    - MBBR Moving Bed Bio Reactor process

    - MBR Membrane Bio Reactor Process

    -DEWAT Decentralized of Wastewater Treatment Process

    - Jel Process

    - Upflow Filter Media System

    - Wetland Land Process , ……..etc;

Moving Bed Bio-Reactor (MBBR)

စီမံကိန်းဆိုင်ရာအချက်အလက်များ	
စတင်တည်ဆောက်သည့်နှစ်	၁၅.၉.၂၀၂၂
စတင်လည်ပတ်သည့်နှစ်	၂၇.၁၁.၂၀၂၂
သန့်စင်သည့်ရေတိုးအချို့အစား	ရေဆိုး (ရေတက်ရပ်ယာဒို)
သန့်စင်နိုင်မှုပမာဏ	၂၂၀၀ ဂါလံ /နေ့
သန့်စင်မှုနှုန်း	Moving Bed Bio-Reactor(MBBR
ရေဆိုးအဝင် BOD	2000-3000 mg/l
ရေဆိုးအထွက် BOD	< 50 mg/l
ရေဆိုးအထွက် TSS	< 50 mg/l

Actual Effective Dimension after Adjustment(MBBR Two Steps)

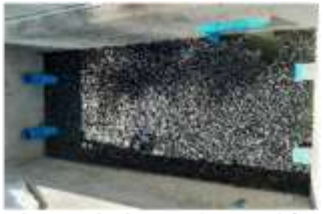
	Inlet BOD		HRT	HRT	HRT	HRT	HRT	HRT	HRT				
	2500 mg/l			6 hr	3 hr	3.5hr	3.5 hr	4 hr	1hr				
Flow rate (m3/day)	BOD (kg BOD/day)		Screening Unit (ft)	Equalization Tank with activated sludge process	Primary Sedimentation Tank	MBBR Tank (BOD Removal)	MBBR Tank (Nitrification)	Secondary Sedimentation Tank	Disinfection Tank	Total Tank Volume/ Dimension	Biofilm Carrier Volume	Air required for BOD Removal	Air required for Nitrification
10	50 kg BOD/Day		ft	ft	ft	ft	ft	ft	ft	ft	ft		
Tank Dimension (Effective Volume)		L	6	5	5	8	6	6	2.5	40.5	8		
		W	5	4	4	4	4	4	4	4	4		
		D	3	6	6	6	6	6	5	6	5.5		
Tank Volume		ft3	90	120	120	192	192	144	50	972	176	680 lit/min	1680 Lit/min

Small Scaled On-Site Wastewater Treatment Plant (10m3) Research Project

Approach Channel

Equalization Tank

Primary Sedimentation Tank



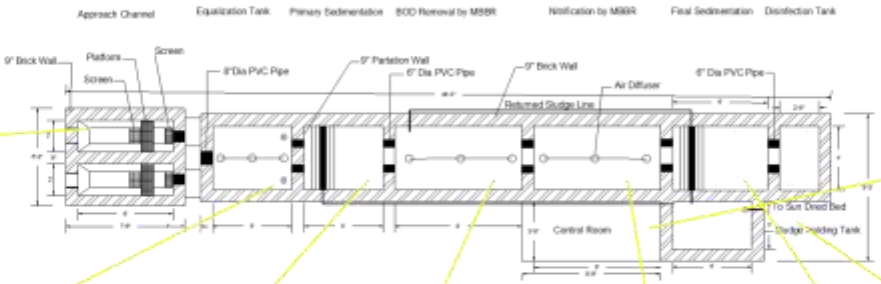
Moving Bed Bio-reactor Tank(BOD Removal)

Moving Bed Bio-reactor Tank (Nitrification)

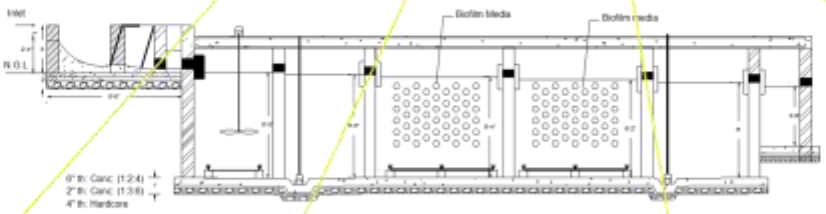
Air Blower House

Sludge Holding Tank

Secondary Sedimentation Tank

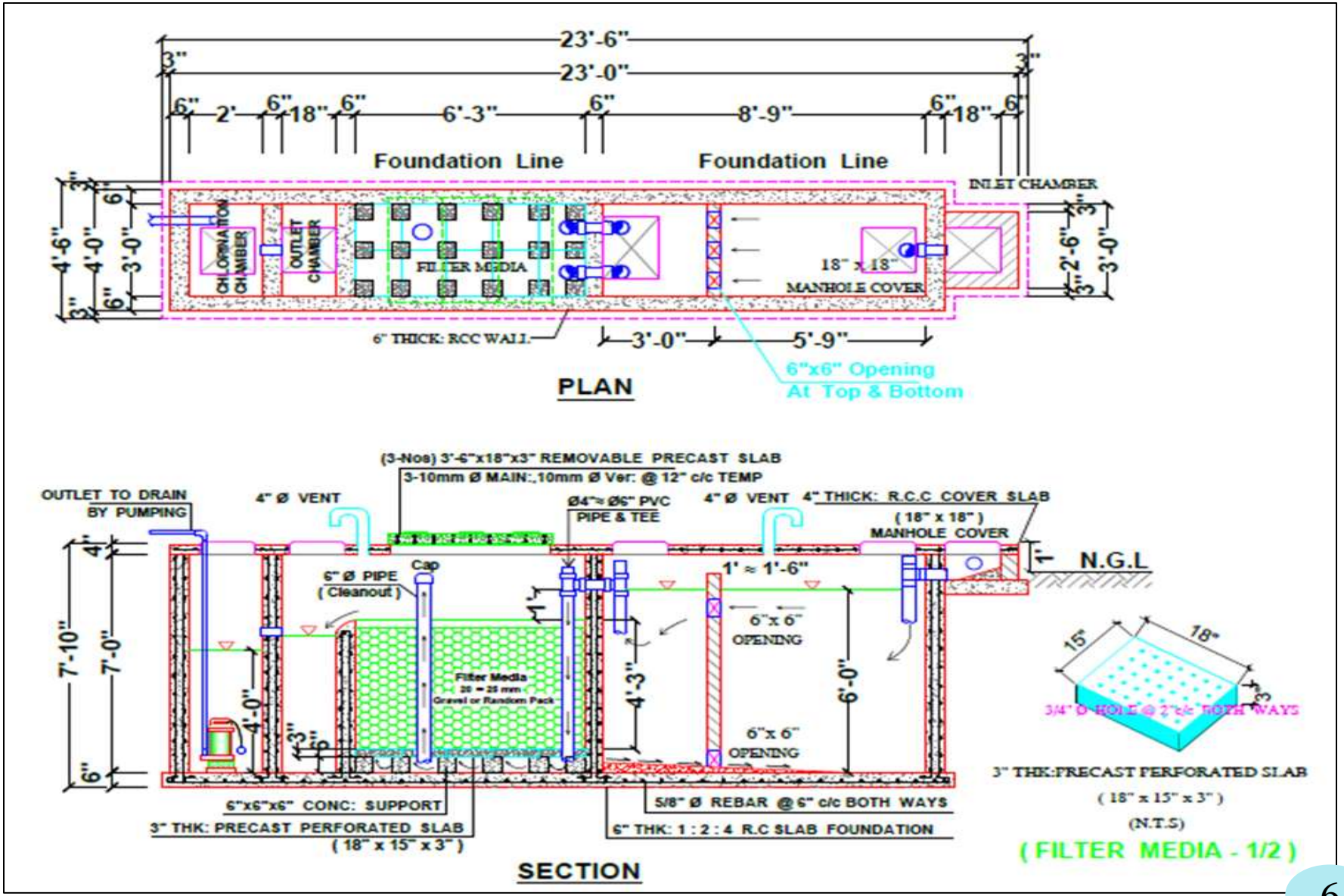


Plan View



Cross Sectional View

Increasing Water Table



Wastewater Nature

- pH (6 – 8), (< 3 or > 8), (25°C - 35°C)
- DO (minimum 2 – 5 mg/l), (< 2 mg/l)
- TSS (30 – 70 mg/l)
- BOD_5 (20 – 50 mg/l)
- COD (50 – 100 mg/l)

Influent Quality (High BOD, COD, TSS)

- Mixed with water (Clear Water Or Treated water)
- Pre-sedimentation
- Pre-aeration
- Use agitator

Sludge

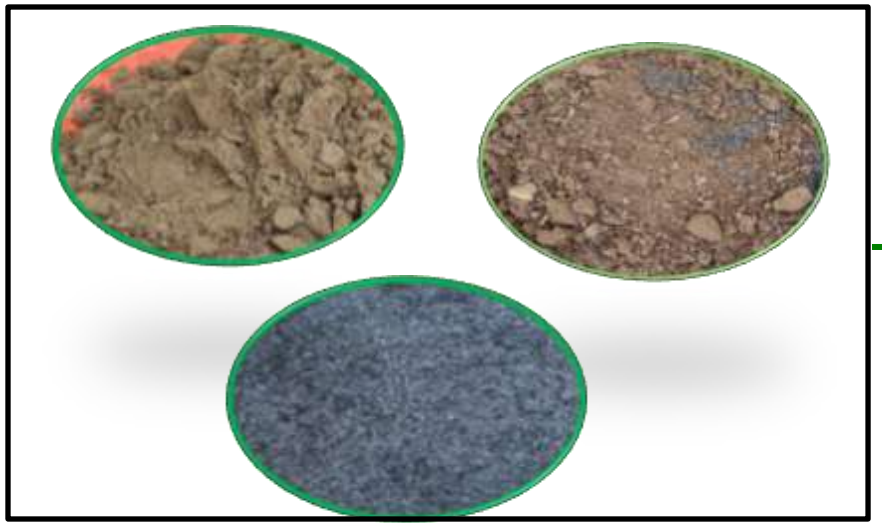
- Good condition for agriculture as fertilizer
- It include a little heat power from human waste
- It mix with sand and Rice Husk ash
- N (Nitrogen), P (Phosphorous), K (Potassium),

  Organic Matter , C:N Ratio include using as fertilizer

Fertilizer

- N, P, K ratio (3-5)
- Moisture content (< 2)
- Organic Matter (> 20)
- C : N (< 20)

Use as a fertilizer



Sand , Sludge & Rice Husk ash

Use as Fertilizer







Sludge များအားအခြားနည်းပညာများဖြင့်ပေါင်းစပ်အသုံးချနိုင်မှု

HANEDA Airport in Japan

KANSAI Airport in Japan

Conclusion

- Wastewater is important
- Wastewater is not controlled (Environment Impact for Public Health)
- Sustainable development goal

“အကြံပြုချက်များ ၊ ဆွေးနွေးချက်များအား ကြိုဆိုအပ်ပါသည်။