The Standard Methods of the Maintenance and the Cleaning in the STP System

Nov–2005

Kitakyushu City Preservation Association
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td></td>
</tr>
<tr>
<td>the Visual Checking Item for the Maintenance</td>
<td>1</td>
</tr>
<tr>
<td>Fig.1</td>
<td>2, 3</td>
</tr>
<tr>
<td>Fig.2</td>
<td>4</td>
</tr>
<tr>
<td>the Method of Cleaning</td>
<td>5</td>
</tr>
<tr>
<td>Fig.3</td>
<td>6</td>
</tr>
<tr>
<td>Fig.4</td>
<td>7</td>
</tr>
<tr>
<td>Fig.5</td>
<td>8</td>
</tr>
<tr>
<td>the Monitoring of water quality</td>
<td>9</td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Drainage System</td>
<td>10</td>
</tr>
<tr>
<td>The various box in the drainage</td>
<td>11</td>
</tr>
<tr>
<td>The measuring equipment for scum thickness</td>
<td>12</td>
</tr>
<tr>
<td>The measuring equipment for sludge thickness</td>
<td>14</td>
</tr>
<tr>
<td>The bad state in the sprinkling weir (maintenance)</td>
<td>17</td>
</tr>
</tbody>
</table>
Preface

It is very important thing that users of STP system must follow the right use.

So, the orner or government authorities of STP must teach the guidance of right use for users.

1) STP system treats all domestic waste waters, but does not treat the garbages.

2) Do not dispose the gabages in STP system.

3) All domestic waste water discharged by washing must be inflowed.

Note It is right to flow the bleaching agent(chlorite type) into STP system.

The bleaching agent(chlorite type) is resolved in the anaerobic tank.
### the Visual Checking Item for the Maintenance

1. **the Drainage**
   - Always
   - The state of the maintenance box in the drainage
   - □ OK □ Opened or damaged → need to be repaired

2. **the STP**
   1) **the Equipment around the STP**
      - Always
      - (1) The state of exhaust pipe
      - □ OK □ Damaged → need to be repaired
      - (2) The state of the inlet hole of air
      - □ OK □ Closed → need to be kept open
      - (3) The state of the effluent pipe
      - □ OK □ Closed → need to be kept open
      - (4) The state of the manhole
      - □ OK □ Damaged → need to be repaired

   2) **the Inner State of the STP**
      - Every 6 months
      - (1) The state of the leak in the both anaerobic tank
      - □ NON □ Leaked → need to be repaired
      - (2) The accumulated state of the scum in the 1st anaerobic tank (see Fig.1)
      - □ NON □ Large thickness → need to be cleaned (taken out)
      - (3) The state of carried SS at the outlet pipe in the 1st anaerobic tank (see Fig.1)
      - □ NON □ Carried over → need to be cleaned
      - (4) The accumulated state of SS on the sprinkling weir
      - □ NON □ Large → need to be cleaned (cleaned)
      - (5) The state of concrete-corrosion at the sprinkling weirs
      - □ NON □ Corrosion → need to be repaired
      - (6) The sprinkling state from all sprinkling weirs (equally sprinkling, most important checking item)
      - □ OK □ Not equally → need to be repaired
Solid substances in inflow water are accumulated in the bottom of the 1st anaerobic tank. The organic matters in solid substances are digested by many bacterias there. (It is called "the sludge".) Gas caused by digestion rise the organic matters to surface with the organic matters. Those risen organic matters are called "the scum". The thickness of the scum is getting larger and larger as STP is used.
Max thickness of it is the depth of the lowest point at the outlet pipe (almost 1.4 m).
If the thickness of the scum is larger than its point, the scum carries over to the 2nd anaerobic tank.
Fig. 1  the accumulated state of the scum in the 1st anaerobic tank
the sprinkling state from all sprinkling weirs (equally sprinkling)

- the water must be dropped down equally from all sprinkling weir (most important checking item)

- the filter media (stones)
the Method of Cleaning

1. the Judgment of Cleaning time
   1) The Drainage
      the stopping water flow by solids in the drainage pipe
   2) The anaerobic tank
      (1) the scum thickness in the 1st anaerobic tank is lower than the lowest level.
      (2) SS from the outlet pipe in the 1st anaerobic tank carries over to the 2nd anaerobic tank.
      (3) SS from the outlet pipe in the 2nd anaerobic tank carries over to the weir.
   3) The aerobic tank
      (1) Many SS on the sprinkling weir → need to wash the sprinkling weirs
      (2) Many SS in the effluent → need to wash the filter media

2. the Method of Cleaning
   1) the sewage pipe ——— every time (see Fig.3)
   2) the anaerobic tank ——— once a year (in Japan) (see Fig.4)
      The cleaning in the anaerobic tank needs the vaccum car.
      (1) The scum and the sludge in the 1st anaerobic tank is taken out by the hose of the vaccum car.
          The hose is put in from the manhole.
      (2) The sludge in the 2st anaerobic tank is taken out by the hose of the vaccum car.
          The hose is put in from the outlet pipe in the 2nd anaerobic tank.
   3) the aerobic tank ——— once a year (in Japan) (see Fig.5)
      (1) Many SS on the sprinkling weirs is washed out by tap water
      (2) Many SS in the effluent shows the phenomenon that the aerobic bacterias are taken off from the filter media.
          If SS can not be cleaned by the showering of tap water, the filter medias must be taken out and be washed.
1) Cleaning brush is made of steel or bamboo.
2) The length of cleaning brush is the length of each drainage box.
3) The right cleaning is executed by high pressure water method.

Solids stop the water flow in the sewage pipe.
Fig. 4  the cleaning in the anaerobic tank

the vaccum hose of the vaccum car

the outlet pipe

the scum

the Sludge

the sludge

the 1st anaerobic tank

the 2nd anaerobic tank
Fig. 5  the cleaning in the aerobic tank

Many SS on the sprinkling weirs are taken off by showering tap water

The filter medias are washed by the showering of tap water
The regular monitoring of water quality is very important. We can confirm the ability of STP. The item of water quality is followed.

<table>
<thead>
<tr>
<th>item</th>
<th>Times of monitoring</th>
<th>Place of monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>4 Times or more a year</td>
<td>inflow and effluent</td>
</tr>
<tr>
<td>TSS (mg/l)</td>
<td>4 Times or more a year</td>
<td>inflow and effluent</td>
</tr>
<tr>
<td>BOD (mg/l)</td>
<td>4 Times or more a year</td>
<td>inflow and effluent</td>
</tr>
<tr>
<td>E.Coli. (number/cm³)</td>
<td>4 Times or more a year</td>
<td>effluent</td>
</tr>
<tr>
<td>TN (mg/l)</td>
<td>4 Times or more a year</td>
<td>inflow and effluent</td>
</tr>
<tr>
<td>TP (mg/l)</td>
<td>4 Times or more a year</td>
<td>inflow and effluent</td>
</tr>
</tbody>
</table>

Option
- Transparency
- Color
- Oil
- Surface active agent
A PROPOSED SEWER SYSTEM
AT BALANGKAPUÑA SUBDIVISION
(PLAN B)

THIS ELEVATION IS
1.4 M BELOW NATURAL
GROUND LEVEL
The Various Box in the drainage

**Straight**

- **ST** 100-150  
  DMSS
  DMST

  2,900円 4

<table>
<thead>
<tr>
<th>品番</th>
<th>呼び径</th>
<th>寸法</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSS</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMST</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Curve (90 degree)**

- **90L右** 100-150  
  DM9LR
  DM9LL
- **90L左** 100-150  
  DM9LR
  DM9LL
- **90L(左右兼用)** 100-150  
  DM9LL
  DM9L

  2,900円 4

<table>
<thead>
<tr>
<th>品番</th>
<th>呼び径</th>
<th>寸法</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DM9LR</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM9LL</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Joint**

- **90Y右** 100×75-150  
  DM9Y1R
- **90Y左** 100×75-150  
  DM9Y1L

  3,900円 4

<table>
<thead>
<tr>
<th>品番</th>
<th>呼び径</th>
<th>寸法</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>100</td>
<td>75</td>
<td>190</td>
<td>135</td>
<td>126</td>
</tr>
</tbody>
</table>
The measuring equipment for the scum thickness

Example

- Bar with Scale
- Hinge
- Wood or Iron Plate

Hand-made equipment (holded type)

- Bar
- Supporter

Dimensions:
- 0.20 m
- 0.25 m
- 1.0 m
- 0.5 m
- 0.01 m

Pin that fixes each bar
Insert the equipment vertically to the scum layer

Slide the equipment slowly

scum layer

Raise the equipment slowly

Look the scale at the top position of the scum

the thickness of the scum
The measuring equipment for the sludge thickenss

String or wire

Colerless Plastic Pipe
Inner diameter = 30~32mm
length = about 1.0 m

Rubber plug

Colerless Plastic Pipe

fix by adhesive

Coupling by colorless pipe
The Bad State in the Sprinkling Weir (Maintenance)

The Corroded Sprinkling Weir
There is no water on the sprinkling weir

the Corroded Sprinkling Weir
the Corroded Main Gutter
The Bad State in the Sprinkling Weir (Maintenance)

The main gutter is corroded here.

The water on the main gutter dropped down straightly here without sprinkling from the weir.