Framework of Collection/Treatment of Septage and Good Practice of Septage Management in Japan

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A short history of the development in on-site technologies and systems to manage night soil and grey water in Japan

Development of on-site technologies/systems

~End of the World War II (1945)

Social circumstances

•Night soil was used as a valuable fertilizer in agriculture.

Technologies and systems

<u>Night soil was stored in vaults</u> and traded for money or vegetables.

• Grey water was directly discharged to the nearby waterways.



However

etc.

 Recommendation of no-use by the Occupation Force to prevent parasitic diseases

Spread use of cheep chemical fertilizers

Modernized traditional style non flush toilet



http://www.okikou.or.jp/nagai_cc/nagai%20si.htm

Social circumstances

Requirement of cistern flush toilet use
 Technologies and systems

- Beginning of <u>household type tandoku-shori</u> johkasou use
- <u>Grey water was still directly discharged</u> to nearby waterways.

Japanese style cistern flush toilet





An example of household type tandoku-shori johkasous

<u>1955~1965</u>

Social circumstances

- Start of economic development
- Urbanization and industrialization
- Spread of public nuisance

Technologies and systems

 Beginning of <u>medium- and large-</u> scale gappei-shori johkasou use to treat grey water together

<u>1985~1995</u>

Social circumstances

- Requirement of access to water environment to get familiar with it Technologies and systems
 - Development of <u>household type</u> <u>gappei-shori johkasous</u> with the effluent BOD≦20 mg/L



An example of medium-scale gappei-shori johkasous



An example of household type gappei-shori johkasous

Currently available off-site and on-site technologies and systems to manage night soil and grey water in Japan

Major night soil/grey water treatment systems

<u>Night soil+</u> <u>grey water</u>



Night soil

Septage in johkasous is called johkasou sludge.

An example of night soil treatment facilities



Concept of a night soil treatment and organic waste recycling center (applied from 1997)

a) Night soil treatment facility



b) Night soil treatment and organi waste recycling center



Time course in reversing the rate of people served by flush toilets and the rate of people served by vault toilets

Trend in night soil/grey water management



- ·Gappei-shori johkasou use includes rural sewerage system use.
- Off-site system includes sewerage system and rural sewerage system.

Legal framework in management of night soil and johkasou sludge

Legal framework for johkasous

Structure

-The Building Standard Law (1950)

It defines johkasous as facilities to be installed before discharging the filth from flush toilets except to sewerage systems.

Structural Criteria of Johkasou (1969)

It was <u>the first nationwide structural criteria</u> of johkasous. The Criteria has been revised several times until now. The latest version has been applied from 2006.



Structure

 Calculation standard for the number of users for design of a johkasou corresponding to building use (JIS A 3302-2000) (2000)
 A Japanese Industrial Standard, of the latest version, to be applied for <u>calculating the number of users for design (NUD) of</u> <u>a johkasou</u> corresponding to the purpose of a building use



<u>Management</u>

• Waste Management and Public Cleansing Law (1970) It designates the details of suppression in emission and optimization of treatment/disposal of wastes.

It defines <u>night soil (including johkasou sludge) as an item of</u> <u>wastes</u>.

- It stipulates that each municipality has to
 - endeavor to take the measures necessary for the proper management of municipal waste (MW),
 - establish <u>a plan for the management of MW (municipal waste</u> management (MWM) plan),
 - <u>collect, transport and dispose (including recycle) the MW,</u> <u>according to its MWM plan</u>, before occurring the difficulties against the conservation of its living environment.

A MWM plan consists of two plans.

- 1 A basic plan for MWM: to be the basic policy for MWM of a municipality based on its <u>long-term perspective</u>
- ② A implementation plan for MWM: to decide the specifics of suppression in emission, promotion of reduction and recycling, collection, transportation, disposal, etc. of MW, in <u>each</u> <u>fiscal year</u> based on the MWM plan

In addition, the both plans consist of two parts related to garbage and domestic wastewater.



Management

-Johkasou Law (1983)

It regulates <u>installation</u>, <u>checking/normalization</u>, <u>cleansing and</u> <u>manufacturing</u> of johkasous, and designates the system to optimize these works.

(In general, checking/normalization and cleansing are called collectively <u>maintenance</u>.)

It states, in the Article 52, "Each municipality has to endeavor to collect the sludge and scum, etc. that is generated in and collected from johkasous within its administrative area, and to treat them in its own night soil treatment facilities". Facility for accumulation of johkasou sludge and positioning of cleansing (composed of desludging and washing) in the framework of johkasou management

Accumulation method of johkasou sludge classified by the treatment capacity or NUD

NUD: number of users for design

Small-scale johkasou : for NUD of 5 to 50
 No special facility for sludge accumulation

- Medium-scale johkasou : for NUD of 51 to 500
 A johkasou with a flow equalization tank for NUD of 101 or more has to be equipped a <u>sludge thickening-storage tank</u>.
- Large-scale johkasou : for NUD of 501 or more A johkasou with a flow equalization tank has to be equipped a <u>sludge thickening equip-</u> <u>ment</u> and a <u>sludge storage tank</u>.

For a johkasou with no facility for sludge thickening and storage, it is required to accumulate sludge in the johkasou itself.



Small-scale FRP made johkasou



Medium-scale FRP made johkasou



Large-scale RC made johkasou

Frame of johkasou management and positioning of cleansing under the Johkasou Law



Necessary works at site : Installation, checking/noralization, cleansing and inspection



Installation



Checking/ normalization



Legal Inspection



Number of organizations and personnel for johkasou works



Items of cleansing defined by Johlasou Law

Purpose

Recover normal treatment performance

Contents

- Removing sludge (desludging)
- Washing the johkasou
- Confirming and reporting, if there are faults or defects in the johkasou

Frequency

Once a year at least

Responsible organization

·Johkasou cleansing vendor which should be registered

Responsible technician

·Johkasou cleansing technician who should be certified

Concrete works of cleansing

Cleansing works

[Preliminary step]

☆ Deciding the necessity of removing sludge

To decide the time when sludge should be removed based on treatment performance of and sludge accumulation in the johkasou.

Treatment performance is judged by the results of checking/normalization works and/or annual inspection. Sludge accumulation is checked by inserting a pipe.







☆ Desludging (removing sludge)

The method and the volume of removing sludge has to be decided depending on the <u>function of each unit equipment</u>.





☆ Washing

After desludging, equipment is washed to be clean.



☆ Water filling

After washing, water corresponding to the amount of removed sludge is added.

☆ Transport of removed sludge

Sludge is <u>transported to a night soil treatment facility or a night</u> <u>soil treatment and organic waste recycling center</u> for treating₂₈