



Advanced Johkasou System

Water Environment Improvement Project

in The World Heritage City in Laos

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■ Outline of the Project

Country/region Luang Prabang City, Luang Prabang Province, LPDR

Purpose

Japan's johkasou technology will be introduced to realize advanced domestic wastewater treatment by removing BOD and ammonia, contributing to the improvement of the water environment and the conservation of tourism resources in Luang Prabang City.

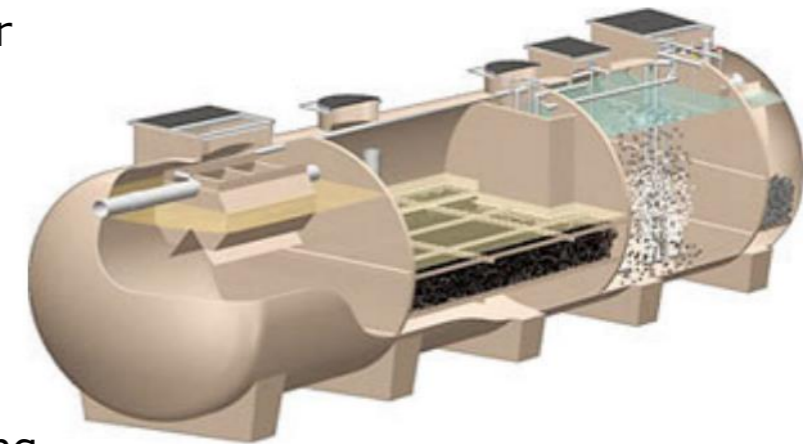
Implementation content

- Confirmation of water environment improvement effect through demonstrating the treatment performance of advanced johkasou
- Examination of johkasou introduction method and maintenance technology suitable for inflow wastewater characteristics in Lao.
- Examination of regulations and systems necessary for introducing johkasou
- Building a johkasou business model that suits the actual situation in Laos

Technology Advanced johkasou technology

Expected effect

- Improved environmental sanitation and water environment will contribute for sustaining tourism resources in the World Heritage City through high-quality wastewater treatment using Japanese Advanced Johkasou System.
- Johkasou business model that integrates “EPC + OM” will be introduced to Lao



Advanced Johkasou System

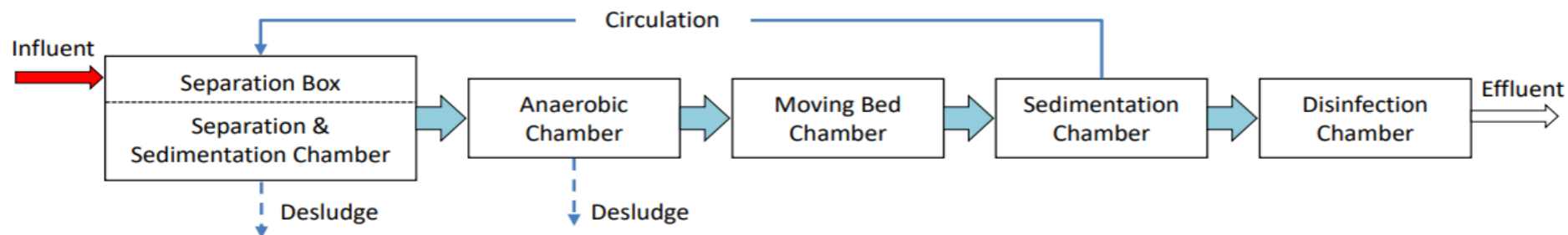
- Treatment process :
Sedimentation anaerobic filter moving bed

- Treatment performance :

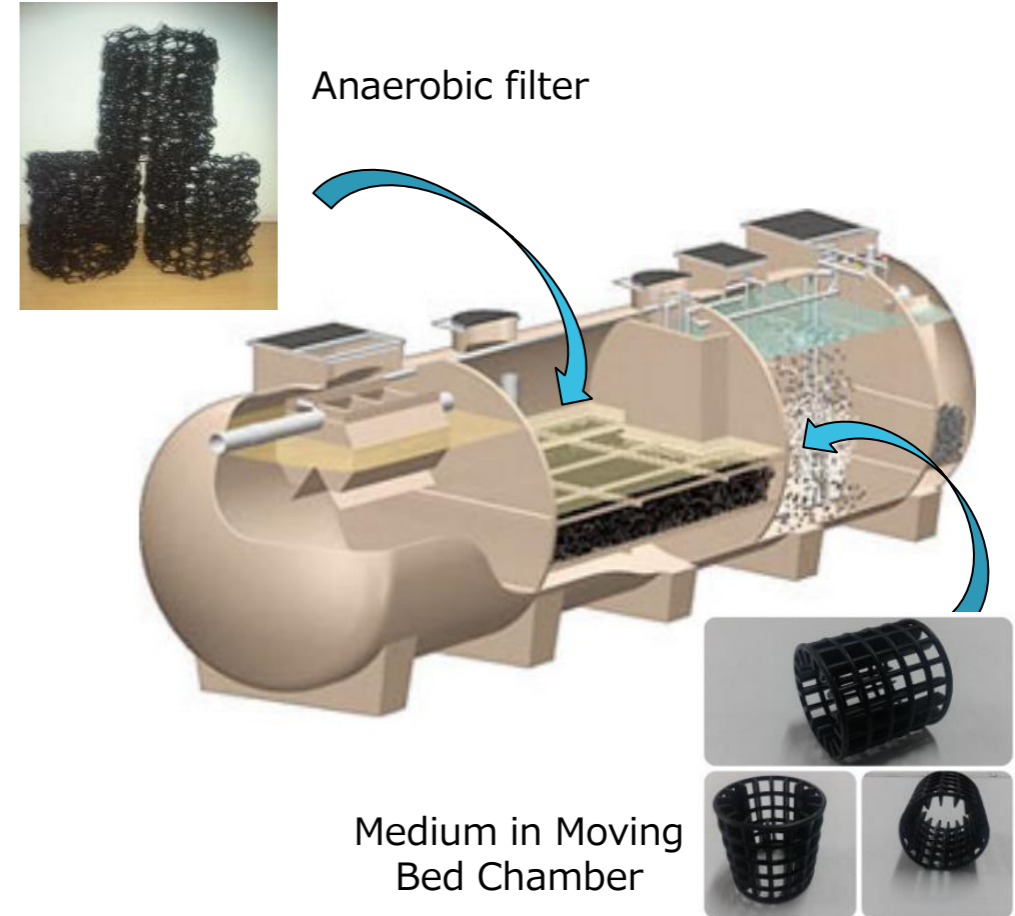
	Inf.	Eff.	Removal rate
BOD	300mg / L	20mg / L	93%
NH₄ - N	50mg / L	10mg / L	80%
T - N	50mg / L	20mg / L	60%

- Feature :
 - ✓ complies with ammonia regulations in ASEAN countries
 - ✓ High performance with less space
 - ✓ Long life design with excellent durability
 - ✓ Easy to maintenance
 - ✓ Energy-saving design, 50% reduction in electricity consumption compared to conventional type

- Flow sheet:



Johkasou technology adopted in the Project



Targets of Client (Buildings)

How to control water pollution?

- LPB is rapidly urbanizing.
- Restricted Effluent Standards are applied to Large size buildings.

Representatives of National Effluent Standards - No.0832/2017/MONRE Water

Parameter	Maximum permit for each type					Unit
	A	B	C	D	E	
pH	5.5-8.5	5.5-8.5	5.5-8.5	5.5-8.5	5.5-8.5	—
BOD ₅	20	30	40	50	60	mg/L
TSS	30	40	50	50	60	mg/L
TKN	35	35	40	40	—	mg/L
FOG	20	20	20	20	100	mg/L

Ex. of Building Type	Building Size	
	A	B
Condominium	500 rooms or more	100 rooms but not more than 500 rooms
Hotel	200 rooms or more	60 rooms but not more than 200 rooms
Hospital	30 beds or more	10 beds but not more than 30 beds
School, Academic, institute	25,000 m ² or more	5,000 m ² but not more than 25,000 m ²
Office	55,000 m ² or more	10,000 m ² but not more than 55,000 m ²
Commercial Center	25,000 m ² or more	5,000 m ² but not more than 25,000 m ²
Restaurant, Food center	2,500 m ² or more	500 m ² but not more than 2,500 m ²

Installation and Start-up



Santiphap High School and Dormitory



Unloading



Installation



Supporting



Supporting



Backfilling



Piping



Slab casting



Control box



Overall view



Stormwater drain

Inspection and Treatment Efficiency



Effluent (Transparency: more than 50cm)

Experience in Japan

- More than 1,000 plants of household, school, public office, etc. are operated.
- Nasu Create is working with local communities as an essential service provider in wastewater management.



Acknowledgment in Lao

- Nasu Create believes that our Japanese excellent technology will be aware by practice as community-based business since wastewater management service has developed through working together with local communities.



Johkasou System operated by Nasu Create (in Japan)

Track Records in Vietnam

With the cooperation of developer, Nasu Create is engaged in EPC business of Advanced Johkasou System mainly in industrial parks, apartment complexes and commercial facilities in Vietnam, among developing countries. In 2016, Nasu Create Viet established the office and invested in a local subsidiary in Vietnam.

Year	Location	Type of Buildings	Treatment Capacity
2016	Bac Ninh Industrial Park	Factory	100 m ³ /day
2017	Bà Rịa-Vũng Tàu	Commercial	100 m ³ /day
2019	Hai Phong City	Apartment Complex	100 m ³ /day
2019	Ho Chi Minh City	Vocational School	80 m ³ /day



Underground installation



Outdoor installation



Green and Clean in Luang Prabang

Water Environment Improvement Project will provide many knowhows accordant with local requirement in Lao.



Ministry of the Environment



ວະບົບບໍາບັດນໍ້າເປັນນີ້ ພາສາອັດຕະໂນວາ: “ ໂຈກະໂຊ (Johkasou)” ແລະໄດ້ນຳມາຕັດຕັ້ງໂດຍບໍລິສັດ Nasu Create ຈຳກັດ ໂດຍການສະໜັບສະໜູນຈາກກະຊວງສິ່ງແວດລ້ອມຂອງປະເທດຍີ່ປຸ່ນ.

ວະບົບບໍາບັດໂຈກະໂຊນີ້ ຈະໄດ້ບໍາບັດນໍ້າເປັນອາກາດສົດສູງນໍ້າເປັນອັນດີໃນຊີວິດປະຈຳວັນ (ເຊັ່ນ: ນໍ້າເປັນທີ່ມາຈາກເຮືອນຄົວ, ການຊີກເຄື່ອງ ແລະອື່ນໆ) ຂອງພໍ່ແມ່ກຽນໃຮ່ງຮຽນມັດທະຍົມສົມບູນສັນຕິພາບ ໃຫ້ກັບຄືນເປັນນໍ້າໃສ່ ແລະໄຫຼໜຸນດຽນໄປສູ່ສິ່ງແວດລ້ອມ. ວະບົບໂຈກະໂຊນີ້ ເປັນວະບົບບໍາບັດນໍ້າເປັນແບບກະຈາຍທີ່ໄດ້ນຳໃຊ້ໂດຍທົ່ວໄປໃນປະເທດຍີ່ປຸ່ນ. ຫວັງເປັນຢ່າງຫຍິ່ງວ່າວະບົບໂຈກະໂຊນີ້ຈະເປັນປະໂຫຍດ ແລະປະກອບສ່ວນເຂົ້າໃນການປົກປັກຮັກສາສິ່ງແວດລ້ອມນໍ້າຂອງແຂວງຫຼວງພະບາງ ແລະປະເທດລາວໃນອະນາຄົດ.

This wastewater treatment facility that is called “Johkasou” in Japanese was introduced by Nasu Create Co., Ltd. with the support of the Ministry of the Environment of Japan.

Toilet wastewater and miscellaneous wastewater (cooking and washing wastewater) from the dormitory of Santiphap High School are returned to clean water through biological treatment, and circulated to the environment.

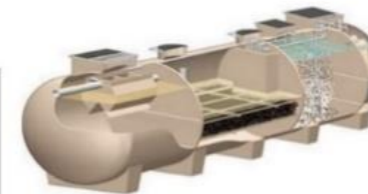
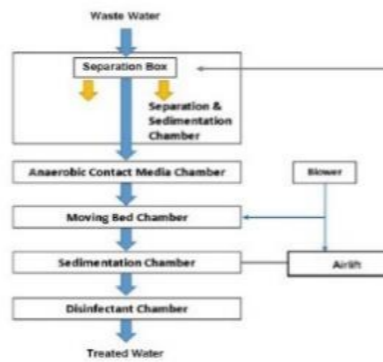
Johkasou is a decentralized domestic wastewater treatment facility that is used in Japan. We expect that Johkasou will contribute to the preservation of the water environment in Luang Prabang and Laos in the future.

ຄຸນນັກສະໜອງວະບົບໂຈກະໂຊ

- ສະໜອງການອັດຕະໂນວາທີ່ຖືກຕ້ອງສູງສ່ວນທີ່ມີພື້ນທີ່ແຄບໄດ້.
- ໄວຍາວການຕັດຕັ້ງສິ້ນ.
- ມີປະສິດທິພາບໃນການບໍາບັດສູງ ແລະເສັດທີ່ດີໃນການປັບປຸງສະພາບແວດລ້ອມນໍ້າໃກ້ຊາຍ.
- ບາດ້ອຍເປັນ ແລະທົນທານ, ປະຢັດພະວັງງານ ແລະອາຍຸການໃຊ້ງານຍາວນານ (30 ປີຂຶ້ນໄປ).
- ສົມປະກົມປະສິດທິພາບການບໍາບັດສູງດ້ວຍການຮຸ່ນຮອງ ແລະບໍາບັດຮັກສາ.

Features of Johkasou

- It is compact in size, so that it can be installed even in narrow space.
- Short installation work period.
- High treatment performance and great water environment improvement effect.
- Light weight but tough; energy saving and long lifespan (30 years or more).
- Operation and maintenance are necessary for ensuring high treatment performance.



	Influent	Effluent	Env. St.
BOD, mg/L	300	10	20
NH ₄ -N, mg/L	—	10	—
T-N (TKN), mg/L	50	20	(35)



Nasucreate Co.,Ltd

Installed in September 2022

Present Operation of Johkasou – LPB Water Environment Improvement Project



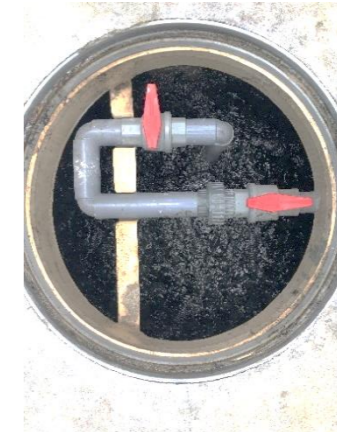
Top: Separation Box

Bottom: Moving Bed Chamber

(left: before desludging) (right: after desludging)



Anaerobic Chamber



Moving Bed Chamber



Moving Bed Chamber



Sedimentation Chamber



Effluent Trough



Effluent
(Transparency: more than 50cm)

Thank You

ຂອບໃຈ Khob Chai

 **nasu create**
株式会社 那須クリエイト

<http://nasucreate.com/oversea/>

