Demonstration Project for Chain Type Screen Unit

Maezawa Industries, Inc.

Outline

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5. Demonstration
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1. Project Summary

Project Name	Demonstration Project for Chain Type Screen Unit
Technology	Chain Type Screen Unit (Automatic Screen that prevents and scrapes up fine suspended solids in inflowing sewage)
Target Country	Kingdom of Thailand
Demonstration Site	Laem Chabang City Wastewater Treatment Plant
Lead Organization	Maezawa Industries, Inc.
Period	August 2023 - March 2025
Counterpart	Ministry of Interior (Thailand), Laem Chabang City, Wastewater Management Authority (WMA) , Bangkok Metropolitan Administration (BMA)
Demonstration Overview	● In the demonstration test, the Chain Type Screen Unit will be installed at the same location as the existing failed screen and operated under the same conditions to **verify stable operation** and **the effectiveness of the Large Object Avoidance Mechanism**. ● This project will demonstrate **the importance of appropriate model selection** and confirm **the adaptability and reliability of the Unit for combined sewer systems in Thailand**.

2. Local Issues & Solution

Sewerage in Thailand	
Coverage rate	13.7%（septic tank: 83.1%）(as of 2020)
Sewer system	**Combined Sewer**
No. of WWTP	174 locations（mainly lagoon method）
Construction	Ministry of the Interior
Management	Local Authority, WMA, BMA
Sewerage fee	Uncollected

Continuous Belt Type

Wire Rope Type

Pump clogging

Sand & Debris accumulation

Local Issues: Selecting a Screen unsuitable for combined sewer systems has caused equipments failures and dysfunction in the wastewater treatment facility.

Demonstration Site: Laem Chabang WWTP (Lagoon with modified OD, Cap.: 7,000 m^3/day))
Management: Laem Chabang City, Existing screen: **Continuous Belt Screen**

Continuous Belt Screen: ・Compact and Low price
・Many small parts, vulnerable to sand inflow ・Suitable for separated sewer systems

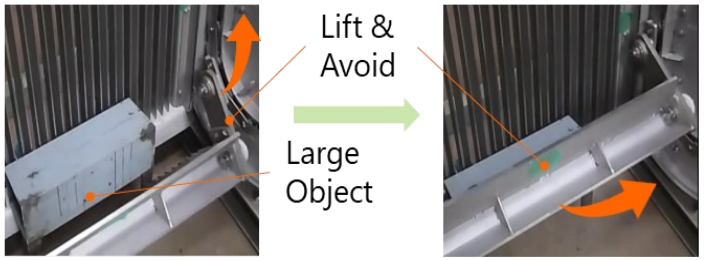
Solution: Selection of a suitable screen model for a combined sewer is important
➡ **Chain Type Screen Unit was selected as the demonstration device**

3. Details of Technology

Chain Type Automatic Screen Unit

Units installed: 56 (as of Dec. 2025)

Protective



Large Object Avoidance Mechanism

Easy Maintenance

Auto Greasing Unit

Lubrication is designed to only 2 points with Auto Greasing Units

Chain Guide

By eliminating sprockets & bearings in the submerged section, there is no need for lubrication

Easy Installation

Unit Structure

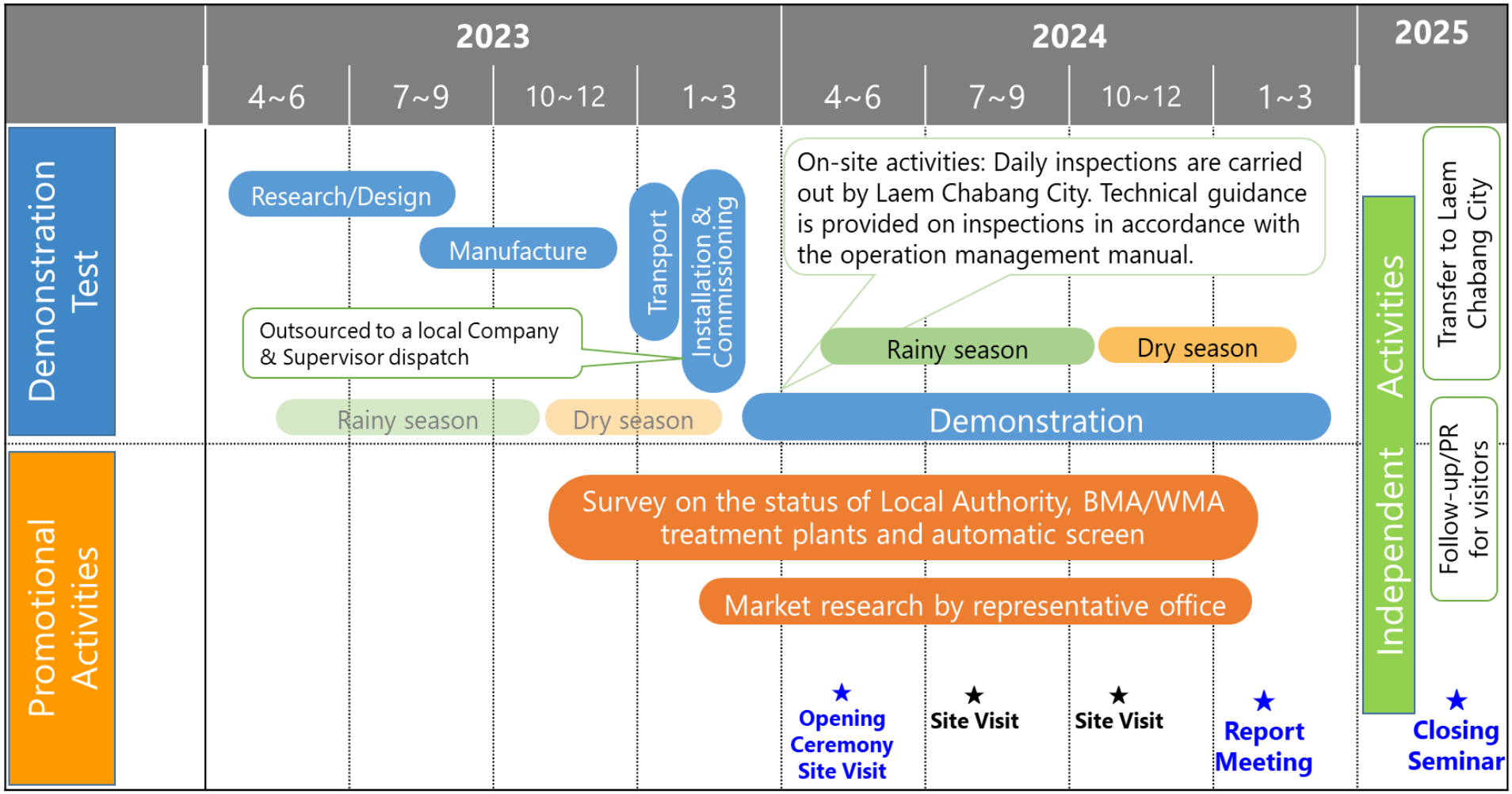
Due to unit structure, construction period and cost can be reduced.

Main Materials **SUS304**

Features

- ✓ **Suitable to Combined Sewer:** "Foreign Object Avoidance Mechanism" and resistant to sand inflow.
- ✓ **Easy Installation**: due to unit structure, construction period and cost can be reduced.
- ✓ **Easy Maintenance**: simple structure, less prone to defects and easier to maintain.

4. Project Schedule



5. Demonstration *<Internal Inspection & Transport (Dec-Feb 2024)>*

Dimensional inspection

Standard accessories

Horizontal operation test

Vertical operation test

Transport packing

Packing completed

Pallet loading

5. Demonstration *<Installation & Commissioning (Feb 16-23, 2024)>*

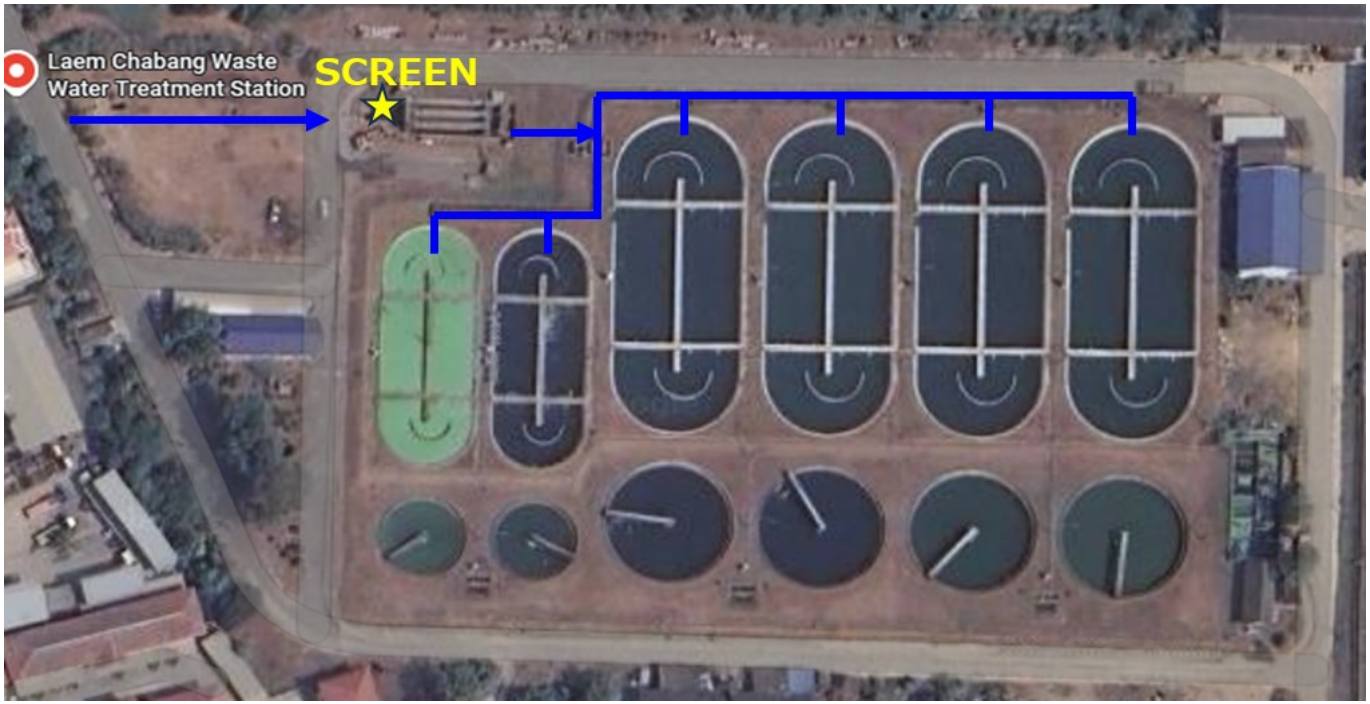
On-site unloading

Installation work

Completed

Operations briefing

5. Demonstration *<Operation Conditions>*



Date	Raw Pump Operation	Screen Operation	Remarks
Feb 23~May 15, 2024	1 time/day ×8 minutes	1 time/day ×5 minutes	Intermittent operation by large scale pump.
May 16, 2024~Aug 8, 2025	4 times/day ×8 minutes	6 times/day ×5 minutes	Inflow to the treatment plant increased after pump replacement at the No.2 pumping station
Since Aug 8, 2025	Float control	6 times/day ×10 minutes	Installation of new pump at the treatment plant (large scale pump → appropriately sized pump)

5. Demonstration *<Drivability>*

Operation after heavy rain (Sep 23, 2024)

Operation during heavy rain (Aug 8, 2025)

Screenings Removal Capacity: 4.46 m^3/hr (design value)

Waste container

Behind the Screen

5. Demonstration *<Energy saving & Maintainability>*

Energy saving

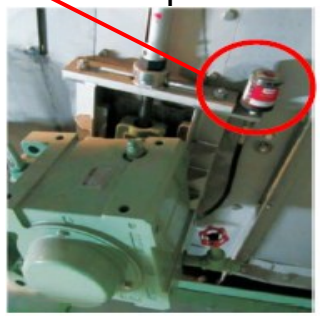
Motor output of existing Continuous Belt Screen	Motor output of Chain Type Screen Unit	Power Reduction Effect (rough estimate)
2.2 kW	1.5 kW	**32%**

Maintainability

Items	Contents	Period/ Required Time
1. Visual inspection	✓ Entire equipment ✓ Reducer, Electric motor ✓ Lubrication	Daily / 30 min
	✓ Rake, Main chain & Sprocket ✓ Drive shaft, Wiper	Monthly / 30 min
2. Lubrication oil	✓ Reducer: change of oil	Every 6 months / 30 min
	✓ Drive shaft bearing: automatic lubrication device	Every 6 month / 10 min

5. Demonstration *<Maintainability>*

Automatic lubricator
× 2 pieces



✓ First lubrication oil change on November 12, 2024

6. Promotional Activities *<Opening Ceremony>*

Opening Ceremony Date: May 15, 2024

Venue: Laem Chabang City, Chonburi Province, Thailand

Venue 1: Laem Chabang City Municipality Office

Venue 2: Laem Chabang Wastewater Treatment Station

Participating Organization:

- Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- Ministry of Interior (Thailand)
- Embassy of Japan in Thailand
- Chonburi Province
- Chonburi Province Office for Local Administration
- Wastewater Management Authority
- Thammasat School of Engineering
- Asian Institute of Technology
- Laem Chabang City
- Maezawa Industries, Inc.

Venue 1: Opening Ceremony

Venue 2: Ribbon-cutting Event

6. Promotional Activities *<Site Visit>*

Site Visit (Oct 7, 2024)

Site Visit (Jun 13, 2025)

Site Visit (Jul 1, 2025)

Site Visit (Oct 14, 2025)

Visitors

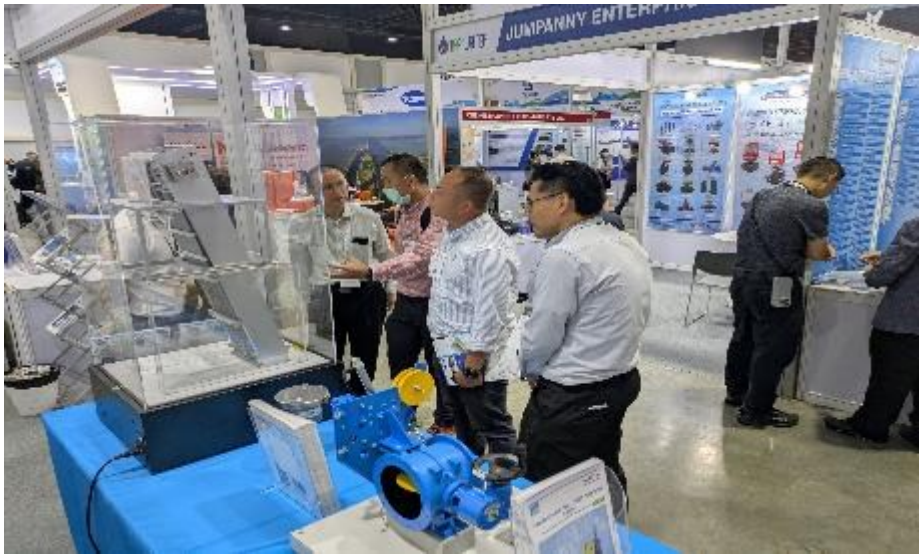
- 【Thai Government】
  Ministry of Interior, WMA
- 【Local Authority】
  BMA, Chonburi Province,
  Phuket City, Pattaya City,
  Sriracha City, Saen Suk City
- 【Thai Local Company】5 companies
- 【University in Thai】
  Thammasat, AIT
- 【Japanese Stakeholders】
  Embassy of Japan in Thailand,
  Saitama Prefecture,
  Japan Sewage Works Agency,
  Sewage Treatment Plant O&M Association,
  Saitama Sewage Systems Agency,
  Private Company

6. Promotional Activities *<Exhibition>*

Emperor's Birthday Reception (Feb 18, 2025)

Thai Water Expo 2025 (Jul 2 – 4, 2025)

Emperor's Birthday Reception (Feb 12, 2026)



6. Promotional Activities *<Project Report Meeting>*

Meeting Date: Feb 10, 2025

Venue: Online

Participating Organization:

- MLIT
- Laem Chabang City
- Maezawa Industries, Inc.

MLIT

Laem Chabang City

Maezawa Industries, Inc.

6. Promotional Activities *<Closing Seminar>*

Closing Seminar Date: Nov 7, 2025

Venue: Laem Chabang City, Chonburi Province, Thailand

Venue 1: Laem Chabang Wastewater Treatment Station

Venue 2: Holiday Inn & Suites Sriracha

Participating Organization:

- Chonburi Province
- Chonburi Province Office for Local Administration
- Saitama Prefecture, Wastewater & Sewerage Bureau
- Wastewater Management Authority
- Bangkok Metropolitan Administration
- Provincial Office of Natural Resources & Environment Chonburi
- Map Ta Phut City, Sriracha City, Sean Suk City
- Thammasat School of Engineering
- Laem Chabang City, Maezawa Industries, Inc.
- Thai Local Company: 3 companies

Venue 1: Site Visit

Venue 2: Closing Seminar

6. Promotional Activities *<Market Research>*

- On-site Survey of Wastewater Treatment Plant
  ⇒ Surveyed 30 treatment plants & pumping stations

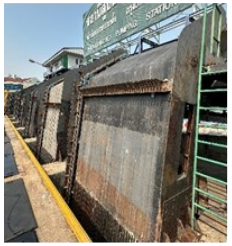
- Assessment of Existing Screen Equipment
- Product Promotion Activities

- Initiation of Replacement Inquiry
- Proposal-Based Sales
  ⇒ Replacement proposals are currently being requested at 8 sites

6. Promotional Activities <*Market Research*>

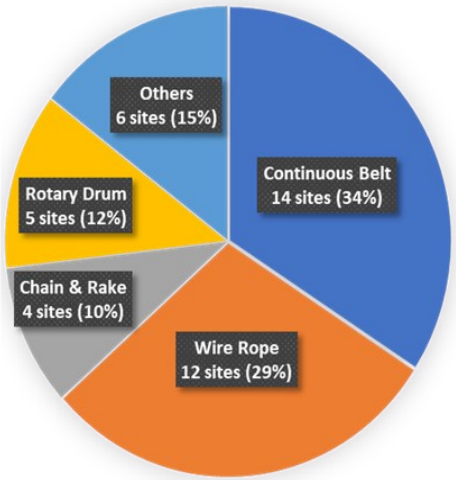
Continuous Band

Rotary Drum



Chain & Rake

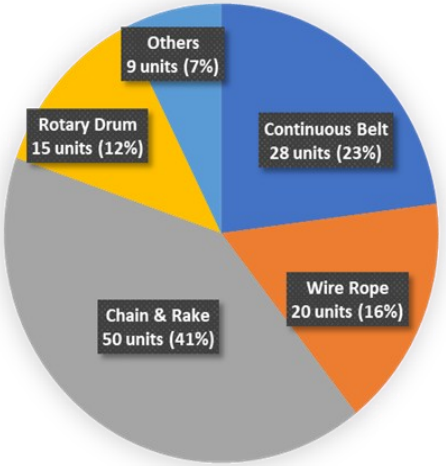
Implemented Site



Continuous Belt

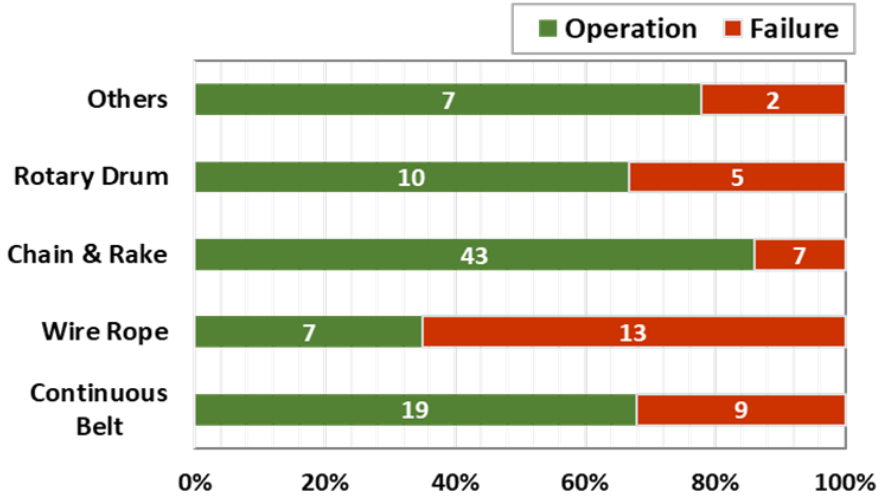
Continuous Belt

Installation Number



Wire Rope

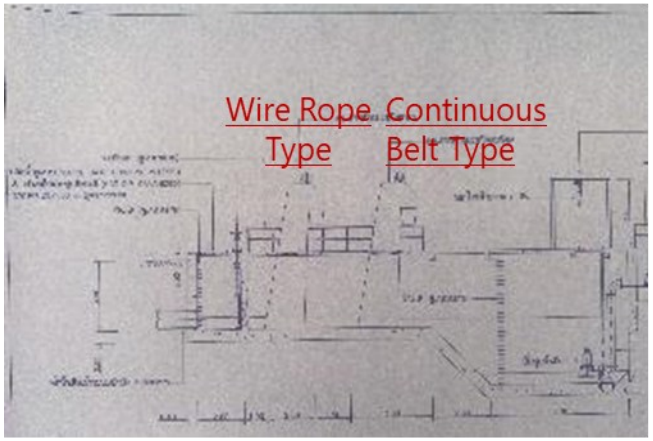
Operation Performance

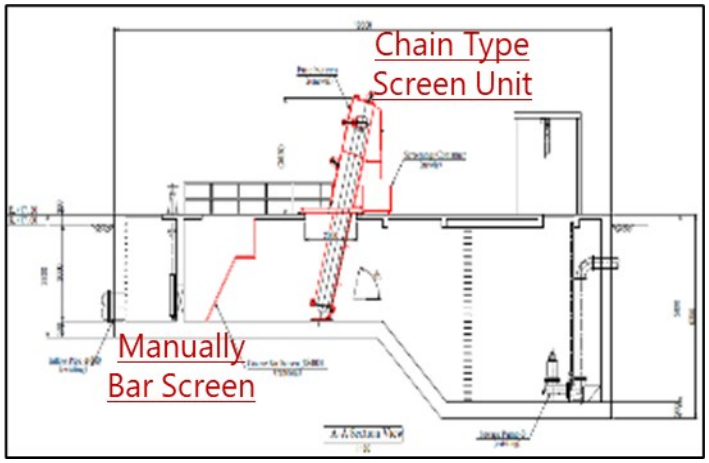


- ✓ Similar to Laem Chabang City, the Continuous Belt Screen is the most widely used in treatment plants.
- ✓ Wire Rope Screens, which require complex maintenance, are also commonly found in Thailand.
- ✓ In terms of installation numbers, Chain & Rake Screens are the most frequently used in large stormwater pumping stations in Bangkok, followed by Continuous Belt and Wire Rope Screens.
- ✓ Regarding operational performance, the Wire Rope type had the highest breakdown rate, followed by the Continuous Belt Screen type. In addition, their maintenance and repairs work is complicated.

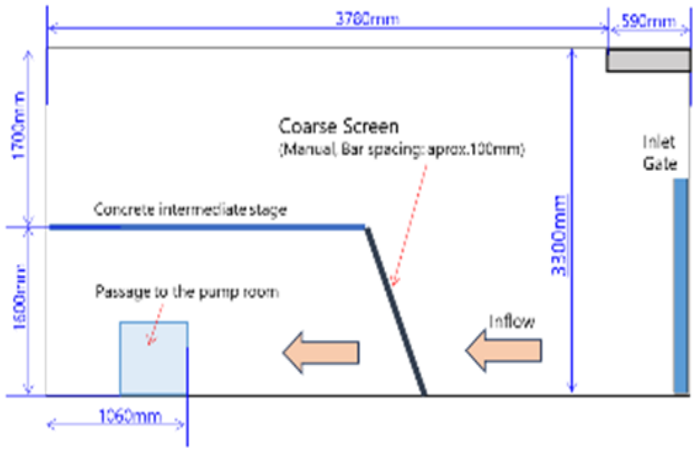
6. Promotional Activities *<Upgrade Proposal Case Studies>*

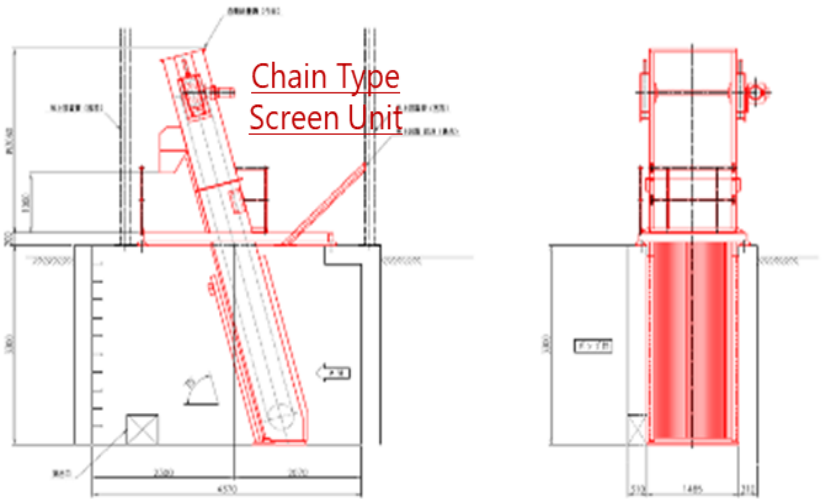
Case Study 1 **Existing System (failure):** 1 wire rope type screen (coarse) + 1 continuous belt type screen (fine)
Upgraded To: 1 manually bar screen (coarse) + 1 Chain Type Screen Unit (fine)





Case Study 2 **Existing System:** 1 manually bar screen (coarse) **Issue:** pump clogging due to debris inflow
New Installation: 1 Chain Type Screen Unit (fine)





7. Overseas Implementation Guideline

Category	Content Overview
Applicability Conditions	• Sewer system: **combined** or separated • Design capacity range: **small to large scale grit chamber facilities** • Channel width/depth: **1 m - 4 m width/Less than 8 m depth** • Bar screen opening: **15 mm – 150 mm**
Technical Advantages	• High durability: **SUS 304, Rake with Large Object Avoidance Mechanism** • High capture efficiency: **continuous operation type** • Reduced clogging risk: **clog-resistant screen** • Ease of maintenance: **auto greasing unit, no sprockets or bearings in the submerged section, direct-drive motor** • Energy efficiency: **high-efficiency motor**
Design Considerations	• Power supply specifications (voltage/frequency) • Bar screen opening, downstream pump diameter • Corrosion protection measures (e.g., potential seawater intrusion) • Establishment of a local maintenance system • Spare parts supply framework
Implementation Roadmap	• Site investigation of existing facilities • Evaluation of implementation effects • Decision on implementation
Policy & Regulatory Alignment	• Compliance with environmental regulations • Improving water quality in receiving rivers and coastal areas