

Demonstration Project for Flood Control Measures Utilizing Drainage Pump Vehicle

Kubota Corporation

Table of Contents

- 1. Project Summary**
- 2. Issues and Needs of Yangon City & Solution**
- 3. Detail of Technology**
- 4. Project Schedule**
- 5. Demonstration Activity**
- 6. Promotional Activity**
- 7. Conclusion**

1. Project Summary (1 / 2)

Project Name	Demonstration Project for Flood Control Measures Utilizing Drainage Pump Vehicle
Technology	Drainage Pump Package
Target City	Yangon, Republic of the Union of Myanmar
Demonstration Site	Yangon city and Kandawgyi Lake
Period	October 2019 – March 2020
Lead Organization	Kubota Corporation
Counterpart	Yangon City Development Committee (YCDC) , Drainage & Wastewater Management Authority (DWMA)

1. Project Summary (2/2)

Demonstration Overview

① Demonstration activities

- ✓ Demonstration of On-Site Fabrication of Drainage Pump Vehicle
- ✓ Survey of flood-prone areas in Yangon and assessment of the use of drainage pump vehicles
- ✓ Demonstration of drainage pump vehicle operation and training for YCDC staff
- ✓ Feasibility study on the application of drainage pump vehicles for Firefighting purposes

② Sales promotion activities

- ✓ Inspection of Japanese drainage pump technology by Yangon officials
- ✓ Conducting a demonstration of a drainage pump vehicle for YCDC executives.

2. Issues and Needs of Yangon City & Solution (1/2)

Monsoon climate + topography + urbanization + undeveloped drainage infrastructure



Frequent inland flooding along drainage channels.

Localized flooding occurred throughout the city.



Social Impact

- Economic losses resulting from the paralysis of urban functions (traffic congestion, impact on daily life, etc.)
- Deterioration of sanitary conditions due to the overflow of untreated sewage

Operational Issues

- YCDC lacks the know-how, personnel, and capacity to implement flood control measures.
- Lack of funds has prevented the advancement of drainage measures.

Needs of YCDC

Prevention of and Early Recovery from Flood Damage

Reliable and Simple Drainage System

Drainage measures that can be implemented within a limited budget

2. Issues and Needs of Yangon City & Solution (2/2)

Establishing systems and equipment for rapid recovery from
localized flooding

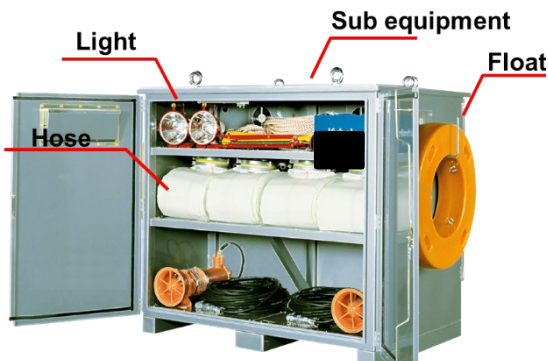
Japanese Technology : Drainage Pump Vehicle



Mobile Pump

- Rapidly rushes to the site with excellent mobility
- Contributes to the early resolution of traffic congestion by draining water down to low levels

**Early recovery from
flood damage**



- Uses an ultra-lightweight pump (35 kg) that can be carried by hand
- Packages all necessary equipment for the drainage work

**Reliable and
Simple Drainage
System**

Drainage Pump Package

- Low implementation costs due to a compact and simple equipment configuration.

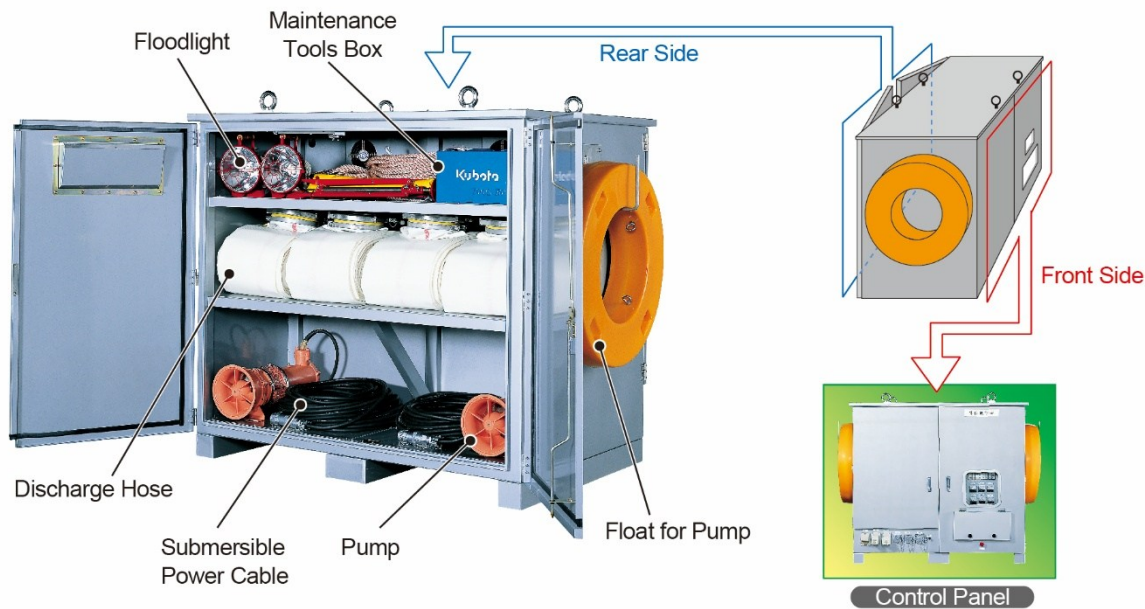
**Drainage measures
that can be
implemented within
a limited budget**



Drainage Pump Vehicle

3. Detail of Technology (1 / 3)

Drainage Pump Package



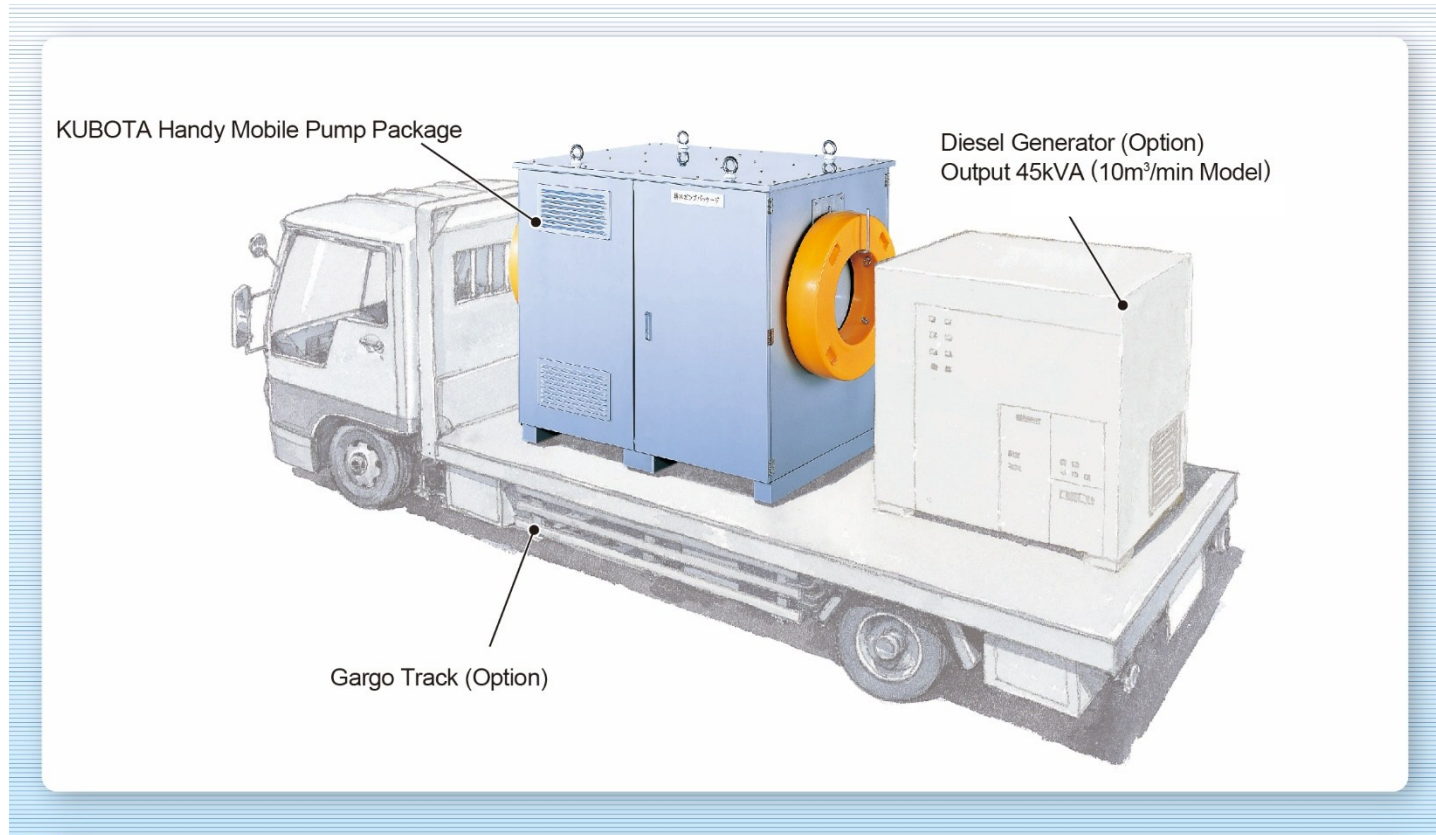
Equipped with two pumps

Drainage Pump Package	
Pump	Φ200x5m3/min x 10m
No. of Pump	2 pcs.
Motor output	12kw
Min. water level	8cm
Drainage Hose	Φ200 x 20m x 2ps(0.2MPa) Φ200 x 20m x 2ps(0.6MPa)
Float	2pcs
Lamps	2pcs(500W/AC220V)
Control Panel	Outdoor closed type with All-in-one stored package) AC220V, 60Hz, 3Phase
Dimension	W1600xD1200xH1500mm

A complete set of equipment required for drainage operations stored in a compact package.

3. Detail of Technology (2/3)

Drainage Pump Vehicle



By mounting a Drainage Pump Package and generator on a truck, a Drainage Pump Vehicle can be created, enabling rapid deployment to flood areas and immediate drainage operations.

3. Detail of Technology (3/3)

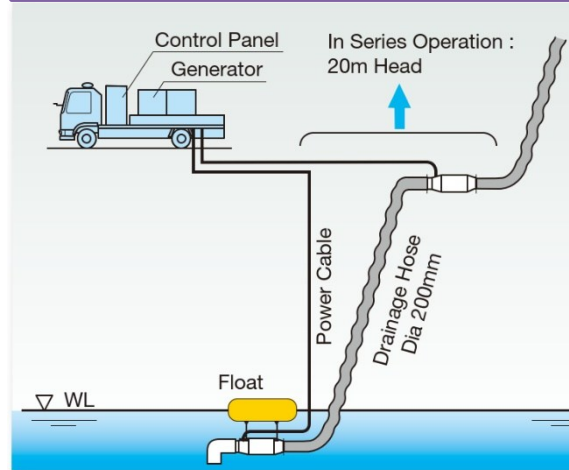
Features of Drainage pump system

Mobile Ultralight



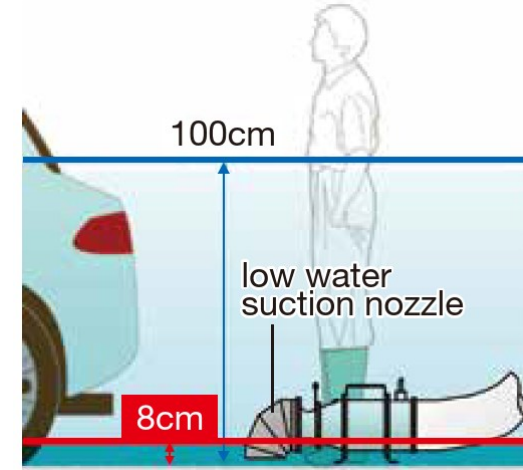
Only less than 32kg
(5m³/min Type)
Portable by Two
Operators

Series Operation



Up to 20m Head
Through Series
Connection

Ultra Low Suction



Drains Water Down
to 8 cm Ideal for
Urban Flooding

4. Project Schedule

Item	Section	Objective	2019			2020		
			10	11	12	1	2	3
1. Project Start (10/16)	-	-	★					
2. Kick-off meeting with YCDC	Promotion	Overview of Drainage Pump Trucks. Sharing Project Objectives.						
3. Inspection of drainage pumps in Japan	Promotion	Understanding Drainage Pumps and Flood Control Measures in Japan.						
4. Assembly and Testing of Drainage Pump Vehicle	Demo	Feasibility assessment of on-site assembly.						
5. Technology Transfer to Yangon City (Operation Training)	Demo	Verification of operability. Informing relevant personnel about the Drainage Pump Vehicle.						
6. Demonstrations against Yangon city officials	Promotion	Promoting Drainage Pump Vehicle to Yangon city officials.						
5. Preparation of drainage work plan	Demo	Survey of areas prone to frequent flooding. Evaluation of methods for utilizing Drainage Pump Vehicle.						
6. End Project (3/19)	-	-						

5. Demonstration Activity

(Assembly and Testing of Drainage Pump Vehicle) (1 / 2)

Demonstration of the feasibility of locally procuring the required generator and truck, and of assembly by local contractors.

Export from Japan



Drainage Pump Package

Procurement in Myanmar



Truck



Generator

Assemble in Yangon



- Verifying specifications for locally procurable generators and trucks
- Identifying vendors capable of vehicle outfitting

5. Demonstration Activity (Assembly and Testing of Drainage Pump Vehicle) (2/2)



Checking mounting position



Welding of reinforcing members



Drilling



Completed Drainage Pump Vehicle

Result of demonstration

- It was confirmed that the trucks and generators suitable for the Drainage Pump Vehicles could be procured in Myanmar.
- It was confirmed that the Drainage Pump Vehicles could be properly assembled by a standard fabrication shop in Yangon. The assembly work was completed in two days.

5. Demonstration Activity (Instruction on operating Drainage Pump Vehicle) (1 / 2)

Demonstration of operability through operation training at YCDC
using a drainage pump vehicle.

① Participants

Engineers and support staff from the all areas of YCDC : 30 personnel in total.

② Schedule

Day1 : 18th Feb, 2020 AM/PM Each 3 hours (Operation explanation and demonstration by Kubota)

Day2 : 20th Feb, 2020 AM/PM Each 2 hours (Operation by YCDC)

③ Venue

Kandawgyi Lake, Yangon



5. Demonstration Activity

(Instruction on operating Drainage Pump Vehicle) (2/2)



Result of demonstration

- YCDC engineers and workers mastered basic operations during the two-day training.
- The process, from the start of preparations to starting the pump, was completed in just under 30 minutes.
- It was confirmed that even workers encountering the task for the first time could master it in a short period.

5. Demonstration Activity (Preparation of drainage work plan) (1 / 3)

In consultation with the YCDC, 11 locations in Yangon frequently affected by flooding were selected. On-site surveys were conducted jointly with YCDC engineers to evaluate plans for utilizing Drainage Pump Vehicle.



5. Demonstration Activity

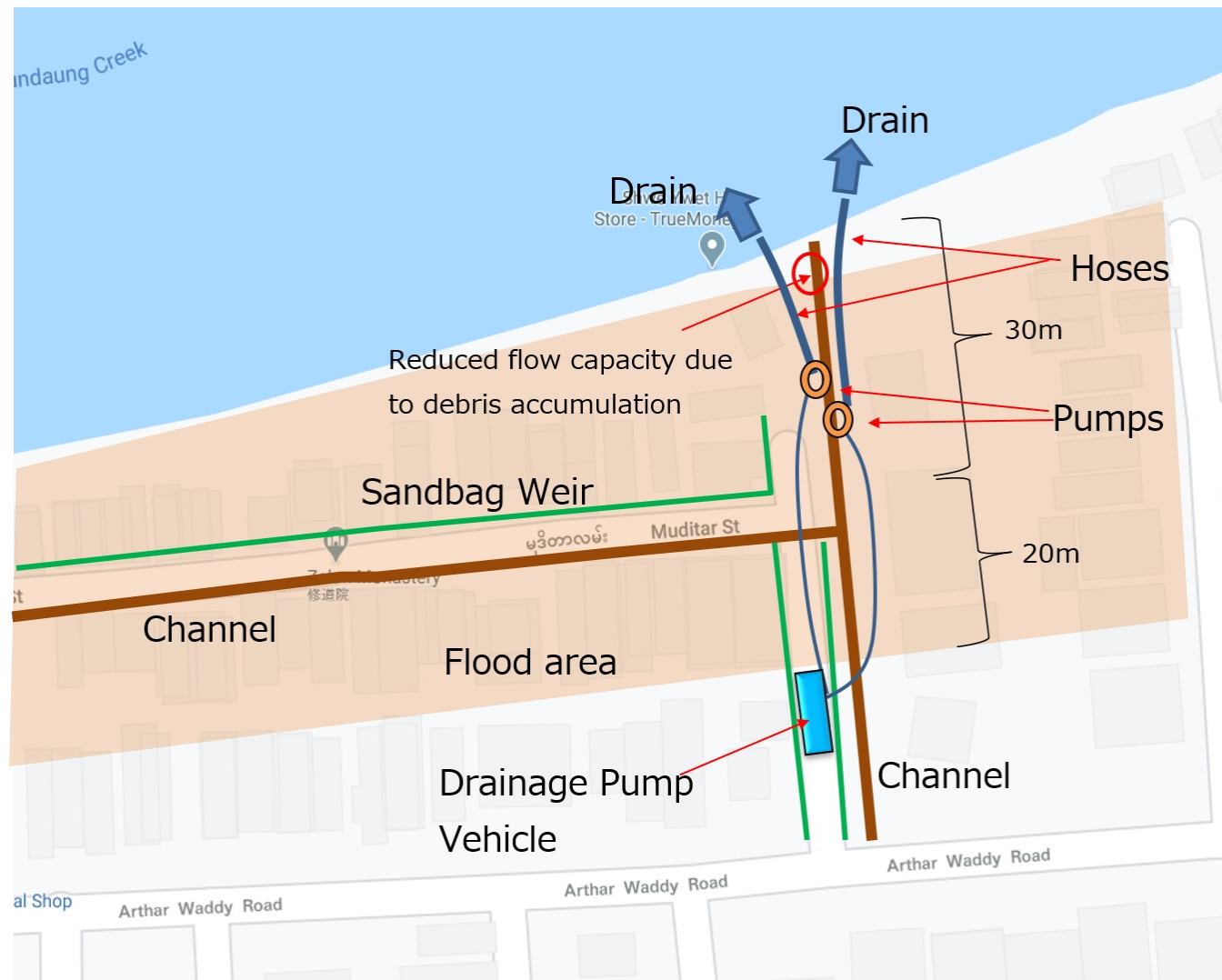
(Preparation of drainage work plan) (2/3)

Example: Results for No. 1



5. Demonstration Activity (Preparation of drainage work plan) (3/3)

Example: Results for No. 1 (Arrangement of Drainage Pump Vehicle and equipment)



6. Promotional Activity

(Inspection of Drainage Pump System in Japan) (1 / 2)

- Invited two individuals – a member of the Yangon Region Parliament and a drainage official from the YCDC – to Japan.
- Provided them with the opportunity to learn about Japanese drainage pump technology.

Day		Contents	Place
19 th Jan	Sun	Yangon Airport → Narita Airport	
20 th Jan	Mon	Courtesy visit to MLIT	MLIT
21 st Jan	Tue	Site visit to drainage pump manufacturing plant	Kubota Hirakata Plant
22 nd Jan	Wed	Fukuoka City Flood Control Measures (Lecture and Site Visit to Stormwater Retention Basin) Site Visit to Standby type Stormwater Drainage Pumping Station	Fukuoka City
23 rd Jan	Thu	Site visit to Gate Pump facility	Ichikawa City
24 th Jan	Fri	Inspection of a drainage pump vehicle Wrap-up meeting	Kanto Regional Technical Office, MLIT/ Kubota Tokyo Head office
25 th Jan	Sat	Narita Airport →Yangon Airport	

6. Promotional Activity (Inspection of Drainage Pump System in Japan) (2/2)



6. Promotional Activity (Demonstration against YCDC Officials)

A demonstration was held against General Manager and other senior officials of the YCDC Road and Bridge Department.



Comments from General Manager

- I realized that the discharge volume exceeds expectations and the pump is extremely powerful; I am convinced that this equipment is essential for Yangon.
- I intend to evaluate the equipment's performance during the rainy season and consider its actual implementation, starting with deployment across the northern, southern, eastern, and western areas.

7. Conclusion

The following results were achieved through the demonstration project for flood countermeasures using Drainage Pump Vehicle in Yangon:

- ✓ It proved possible to manufacture Drainage Pump Vehicle locally by exporting Japanese drainage pump system technology and combining it with local equipment.
- ✓ The Drainage Pump Vehicles are characterized by their ease of operation; YCDC staff were able to master the basic operations for drainage work after just two days of training.
- ✓ We were able to examine how to utilize the Drainage Pump Vehicles in areas across Yangon that are frequently prone to flooding.
- ✓ Two officials from Yangon City were able to learn about Japan's advanced drainage systems.
- ✓ We confirmed that YCDC executives view the Drainage Pump Vehicles as effective for Yangon City and intend to introduce them in the future.