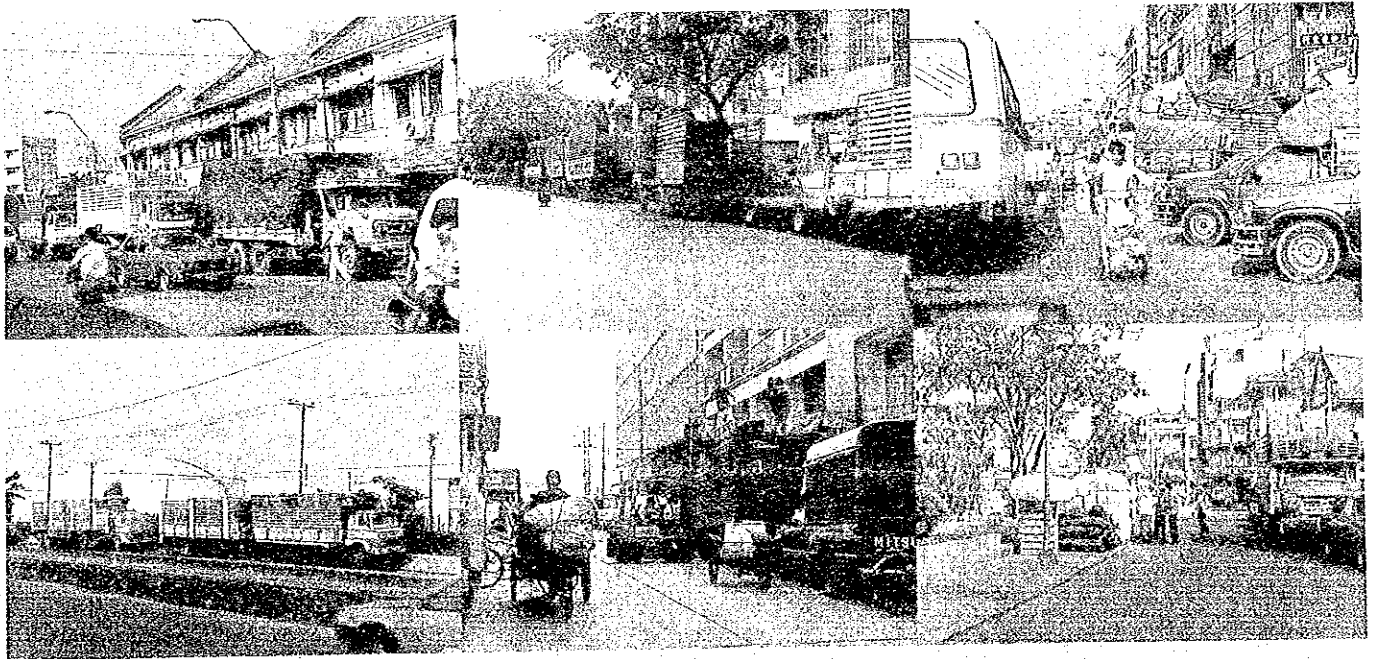


KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF LAND TRANSPORT

**THE STUDY ON GREATER BANGKOK TRUCK
TERMINAL IN THE KINGDOM OF THAILAND**
FINAL REPORT

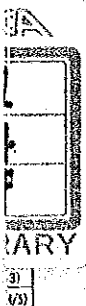
VOLUME 4
OPERATION AND MANAGEMENT GUIDELINE



SEPTEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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**THE STUDY
ON
GREATER BANGKOK TRUCK TERMINAL
IN
THE KINGDOM OF THAILAND**

OPERATION AND MANAGEMENT GUIDELINE

CONTENTS OF TABLE

1. General Management System of Terminal
2. Regulation on Users
3. In-Out Vehicle Regulations
4. Loading and Unloading
5. Sorting
6. Storage
7. Machinery
8. Facility Operation
9. Safety

1. General Management System of Terminal

A. Management Body

This truck terminal will be run by a Truck Terminal Company that will be established by both private and public sectors. Forty-nine (49) percent of the total share will be possessed by the public sector, and fifty-one (51) percent will be possessed by the private sector.

The major sections and their responsibilities are shown in Table PA 1.

Table PA 1 Responsibility by Section

Section	Responsibilities	Ability
Administration Section	<ul style="list-style-type: none"> - general affairs, legal and legislative matters - financial, budgeting and accounting - personnel management - Secretarial work - real and legislative matters 	<ul style="list-style-type: none"> - business administration - accounting - taxation
Supervision Section	<ul style="list-style-type: none"> property management - to supervise truck terminal users - to supervise tenants - to manage facilities 	<ul style="list-style-type: none"> - business administration
Operation Section	<ul style="list-style-type: none"> - to supervise berth operation supervising security promotion of truck terminal - to compile statistical data 	<ul style="list-style-type: none"> - distribution control - marketing and promotion
Maintenance Section	<ul style="list-style-type: none"> - the utility management - building management - machine maintenance - site and infrastructure maintenance 	<ul style="list-style-type: none"> - mechanical engineer - civil engineer - electrical engineer

B. Function of Control Board

The management body of the truck terminal company must consult the Control Board that consists of the government and the other corporations, regarding the following matters:

1. Construction of new truck terminal and expansion of existing truck terminal.
2. Change in terminal charges.
3. Fundamentals of operation and management of the corporation as follows;
 - a) Increase or decrease of capital,
 - b) Change in capital ratio between public and private,
 - c) Change in board members,
 - d) Change in operation and management rules, and
 - e) Other important matters on operation and management.

C. Foundations of Operation Management

Table PA 2 Number of Staff by Section

Case: (No. of Berth)	Case 1 (500)
President	1
Director for Administration	1
Director for Engineering	1
Administration Section	6
Supervision Section	4
Operation Section	3
Maintenance Section	4
Total	20

Table PA 3 Proposed Management Body

Facilities	Management	
	Direct Management	Tenant
Berth	0	
Office at platform	0	
Office at administration building	0	
Parking		0
Temporary storage		0
Rest room		0
Lodging room		0
Repair shop		0
Gas station		0

2. Regulation for Users

A. Definition Users

1. Berth

The berth users should be limited to the trucking industry and should possess the line-haul fixed route license.

2. Office at Platform

Only the users of the berths are allowed to use the office at platform. Necessary space is decided according to the number of berths apportioned among the users concerned.

3. Administration Building

The truck terminal company authorizes the use of the administration building when users can contribute to the truck terminal company.

4. Other Facilities

Berth users have priorities to use other facilities such as gas station, repair shop. General users other than trucking companies can get a permission to use other facilities if ordinal operation and management of the terminal would not be disturbed.

3. In-Out Vehicle Regulations

Any vehicles used in the truck terminal are regulated as follows:

A. Vehicle Specification

Any vehicles that do not meet the government specification and vehicles overloaded should be prohibited to use the truck terminal.

B Hours

Standard administration hour of the truck terminal is set from 8:00 a.m. to 6:00 p.m. However, tenants can decide the opening hours unless otherwise specified.

C. Operation and Management Responsibilities

Generally, parties involved in conflicts shall be responsible for resolving the followings unless specified or unless a facility manager's ability itself is the cause of conflicts:

1. Traffic accidents
2. Theft
3. Damages to the facilities and/or vehicles
4. Other conflict matters.

D. Traffic Rules in the Truck Terminal

1. Inside Path

The maximum speed of a vehicle should be limited to 20 km/hr. Safety issue should be given a highest priority to any other issue.

2. Ingress and Egress of Vehicles to Apron

A person must lead the vehicles backing up to enter the platform.

E. Identification of Permitted Users

Workers in the truck terminal should carry the identification cards and show it whenever requested, and vehicles should show the permit stickers.

4. Loading and Unloading

A. Ingress and Egress of Vehicles to the Platform

Drivers of line-haul and pick-up trucks must follow the supervisions of the back-watchers when they back up to the platform. In addition, the back-hatch (if there is on the back of a line-haul truck) should be opened before the trucks approach to the platform.

B. Load

1. Machinery

Manpower is engaging in loading to trucks now. However, the forklifts will be necessary in near future. When forklifts are used, special attentions should be paid to the use of it and the related facilities since the heights of a platform and truck for loading are different from those for unloading works, and vice versa.

2. Line-haul Truck

a) Slips and Designation Confirmation

When cargoes are loaded into the line-haul trucks, one should confirm that there are destination tags attached to packages. Then packages are sorted by destination. Fragile materials should be grouped separately from ordinal cargoes.

b) Total Load Confirmation

After sorting the cargoes by destination, total load for one line-haul truck should be measured. It should be careful that the load does not exceed the legal maximum load limit. The slips for one truck must be gathered in this process. If overloaded, cargoes must be separated to two or more line-haul trucks.

c) Loading

Packages are loaded by destination. The confirmation items are:

- (1) Tags on packages are placed toward the back of the truck.
- (2) Packages are loaded by destination groups.
- (3) Fragile materials should be placed in the center or the top of the load.
- (4) Overall balance of the load should be considered so that there will not be empty spaces on the truck.
- (5) The number of slips and packages are confirmed and recorded.

3. Pick-up/Delivery

a) Load Transfer and Grouping

Load entered in the line-haul terminal and unloaded on the platform shall be moved to the pick-up/delivery side of the platform. When unloaded, they shall be sorted by direction. Load sorted by direction is further grouped to fit in one truck.

In the process, fragile and other special materials are sorted, and slips are issued.

b) Loading

Packages are loaded into truck by direction. Manpower would be the major power to do this job. On this occasion, the followings should be paid a due attention:

- (1) The slips shall be face-up.
- (2) Load delivered late shall be loaded first.
- (3) Number of packages and slips shall be checked and recorded.

C. Unit load system

1. General

The most efficient device for trucking the cargoes in the Kingdom of Thailand is the pallet system. The system is that packages are sorted and grouped as units.

2. Pallet

The pallet system with forklifts will replace man-power loading and unloading. Expected benefits are as follows:

- a) Time savings in loading and unloading
- b) Work efficiency
- c) Physical work load alleviation for workers

The pallet system can contribute to reduce overall cost. The international standard is set by ISO. Therefore, the standardized pallets should be introduced into this public truck terminal.

3. Freight Stack

Types of stacks for sorting and transferring are listed in Table PA 4.

Table PA 4 Kinds of Stacks

Block Stack	Packages are stacked without altering the direction. As the stack goes higher, it would become unstable because of less friction among boxes.
Alternate line stack	The direction of the faces of boxes is changed by 90 degrees depending on the even or odd row in the stack. This method is possible if the length of the boxes is the multiple of the width of the boxes.
Brick Stack	Vertical and horizontal combination of boxes is used to form one stack. The stack on top of it is turned 180 degrees.

4. Load Stack Collapse Prevention

Packages on the pallets and on the platform shall not be stacked so high that the stacks would have chance of collapse. However, when high stacking cannot be prevented, there are some method to prevent packages from collapsing. They are:

- a) Use of band (Tie packages with bands)
- b) Use of slip-proof sheets
- c) Others

5. **Sorting**

A. Purposes of Sorting

The purposes of sorting are:

- 1. Sorting by shape, bulk, and weight.
- 2. Sorting by purpose, order, and direction.
- 3. Combinations of the above.

B. Information on the Slip

Problems with the slips are the problems of the trucking industry itself. However, information such as name of a person ordered, return address, forwarding address, contents of a package should be included for sorting purposes.

C. Methods of Sorting

1. Unloading

Unloading can be considered as pre-sorting process. While unloading, part of load could be sorted by direction in this process.

2. Sorting

It is important to keep some space for loading, in both line-haul trucks and pickup/delivery trucks' cases, while sorting.

The process is as follows:

a) Single berth case

When a tenant uses one berth, it shall follow the process:

- (1) For the efficient use of the limited space, package for the same direction should be further sorted by fragile, heavy, irregular shaped goods.

b) Multiple berths case

When one tenant or different tenants must sort to different berths, they follow the steps below:

- (1) When multiple berths are used, usually packages' destinations are to different large zones. The packages should be sorted according to the large zones.

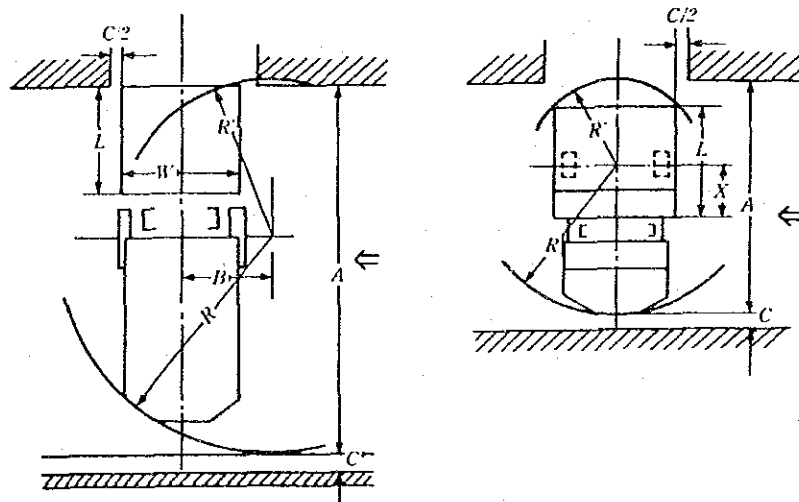
- (2) When the grouped packages are moved to the side ways, the steps of the single berth case are followed.

3. Slip Processing

Especially, when more than one berth are used, the slips transfer system is necessary.

4. Others

The center of the platform is used to move packages to the adjacent berth. The lifter's reaching radius should be cleared for safety and efficiency purpose. This space shall not be used for sorting. It depends on a specific lifter, but 3.5 to 4 meter diameter would be necessary.



$$A = R + \sqrt{(X+L)^2 + \left(\frac{W}{2} - B\right)^2} + C$$

$$A = R + \sqrt{(L-X)^2 + \left(\frac{W}{2} - B\right)^2} + C$$

Figure PA 1 Forklift Operation Radius

Followings are processing method;

a) Stored freight ledger

A ledger for stored freight is prepared including the following items:

- (1) freight slips
- (2) reasons of storage
- (3) date of storage
- (4) processing method

b) Processing method

(1) Uncertain Slips

When forwarding address on slip is not certain, it is necessary to inquire the sender, and find the destination.

(2) Lost Slips

When slips are misplaced or lost, it is necessary to inquire the forwarding company.

D. Storage and Management

1. Flat Stacks

When racks are not necessary, the following items should be paid attention:

- to ensure the space enough for the machine operating on the platform, and
- to ensure the space of path for the machine moving around on the platform.

2. Racks

At present, the flat stack method is expected to be used widely in the Kingdom of Thailand. However, three dimensional use of warehouse space by introducing the racks is indispensable in the future.

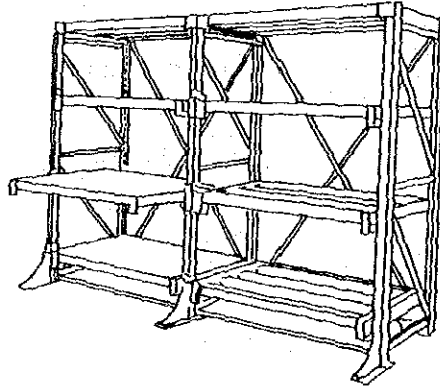


Figure PA 2 Rack

6. Storage

A. Definitions

There are two situations that packages are stored:

1. Platform

When loads are transferred between line-haul trucks and pick-up/delivery truck, there are cases that packages have to be left on the platforms temporarily. This situation would not continue more than twenty-four hours. If it lasts more than twenty-four hours, the causes of delayed delivery should be investigated.

2. Warehouse

A warehouse functions as a storage for packages left in the truck terminal. Two reasons for the delayed delivery are:

- a) Inaccurate information on the slips
- b) Forwarder's and/or receiver's requests.

B. Utilization of Warehouses

A warehouse is used by one or more than one user. When one lot is used by more than one users, the lot should be partitioned not for the packages to be mixed among users of the lot.

C. Uncertain Slips

The packages of which the final destination is uncertain are kept until it turns out valid.

7. Machinery

A. Load Carrying Tools and Machines

If the economy of the Kingdom of Thailand continues to grow, cargo handling methods other than the use of man-powered carts such as forklifts and pallets, will be necessary to process increasing cargo load.

1. Forklift

Using the pallet, it moves and unloads packages.

2. Pallet

The use of pallets gives the foundation for use of forklift. ISO decides the standards and this should be introduced.

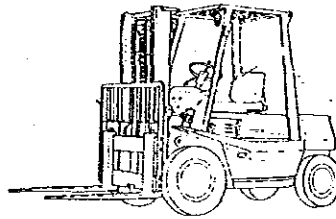


Figure PA 3 Forklift

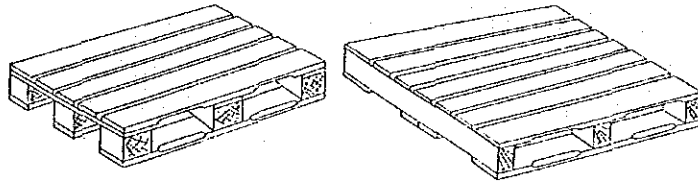


Figure PA 4 Pallet

3. Capability of Forklift

a) Maximum height and load stack height

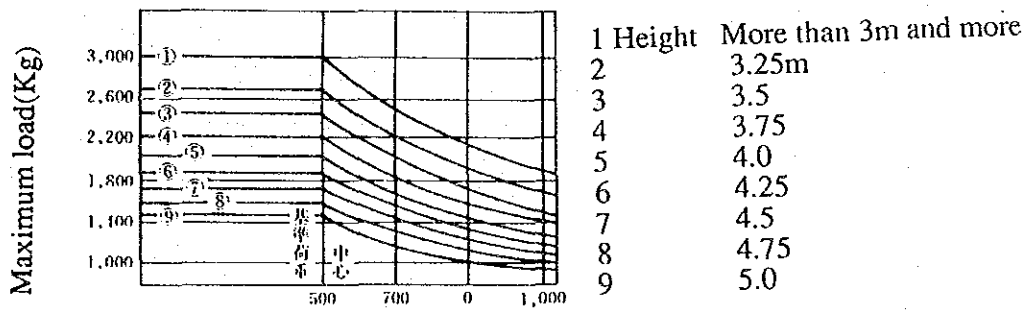


Figure PA 5 Load and Height

b) Paths

Machinery like forklifts need their space for circulation.

Table PA 5 Necessary Space for Machines

Kinds of space	Contents
Straight paths	Space for linear movement
Right angle turns	Space to turn right or left
Perpendicular-Stacking	Space to change the front of Forklifts 90 degrees to stack and/or take out cargoes.

4. Conveyer

There are two kinds of conveyers.

Table PA 6 Kinds of Conveyor

Belt Conveyer	Friction force move the belt continuously
Roller Conveyer	Fixed rollers move materials

5. Cart for Stair

How to use carts for stair is shown below;

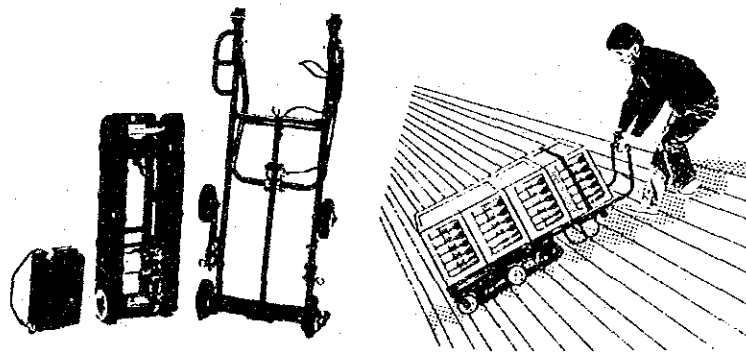


Figure PA 6 Cart for Stair

8. Facility Operation

A. Direct Management

The direct management method shall be used for the facilities, berths, and offices affiliated to berths. The following rules shall be made and enforced to the users of the facilities.

Table PA 7 Management Rules

Items	Explanation
Effective areas	Areas where the rules are effective shall be delineated.
Limit of Users	Some facilities are limited to certain users.
Terminal Charge	Ways of payment
Traffic Rules	Traffic laws are exempted inside the terminal so that traffic rules for the facilities will be necessary.
Treatment of Hazardous Materials	Pertaining to reporting obligation of hazardous materials
Fire prevention and natural disaster prevention staff	Staff for fire prevention and natural disaster prevention shall be appointed for designated areas

B. The truck terminal company shall have contracts with the tenants to authorize the tenants to manage parts of the truck terminal facilities. In the contracts, the following clauses should be included:

Table PA 8 Necessary Contents of Tenants Contract

Items	Explanation
Authorization Limitation	Scope of entrust contract, and responsibilities.
Facility use regulations	Regarding open hours, natural disaster prevention, maintenance, repairs, and other.
Prohibition	Prohibition of business sub contract, and penalty clauses of regulations

9. Safety

A. Ingress and Egress Management

Security guards at the entrance of the public truck terminal shall be in duty on twenty-four hour basis. Vehicles must show the permits, and workers must show their identification cards to the security guards. Times of entrance and exit of vehicles without permits, and people without identification cards must be recorded at the entrance.

B. Patrol (inside the terminal)

The terminal shall be patrolled regularly to check: enforcement of terminal regulation, accidents, fire and other disaster prevention, theft, cleanliness, and illegal parking.

When patrolled, the security guards should report the following items to the truck terminal corporation:

1. Time and date, and name of the security guards
2. Violation report including, the name of the violator, name of a company, vehicle number, time and date of violation, and explanation of violation.

Table PA 9 is an example of such rules and regulations.

Table PA 9 Rules of Security

Items	Explanation
Velocity	: 20 km/hr maximum
Priority	: Vehicles backing up have the first right of way
Passing	: Passing is prohibited.
Parking	: Parking in paths, and other than designated areas is prohibited.
Apron	: Vehicles must stop the engines.

C. Other Operation Regulations

In addition to the rules and regulations listed, following rules must be set and enforced.

1. Vehicle Managers

Users of the facilities choose vehicle managers to keep the terminal in order. The managers have others follow the rules:

- a) Aprons are used only when cargoes are loaded and unloaded. Vehicles must not park at the apron other than this purpose.
- b) When loading and unloading is conducted, vehicles must be moved to appropriate parking areas.
- c) Vehicles specially used in the terminal must show the permit and parked in designated parking lots.

2. Management in the Truck Terminal

For the safety for the workers and facilities, the followings must be set and enforced;

- a) rules on uses of public facilities
- b) Hazardous material treatment and prohibition
- c) Sales of goods not included in the contract
- d) Meeting and congregation rules other than truck terminal use.
- e) Detailed rules for intra-terminal, and approach to the aprons.

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