# CHAPTER 3: PROJECT DESCRIPTION

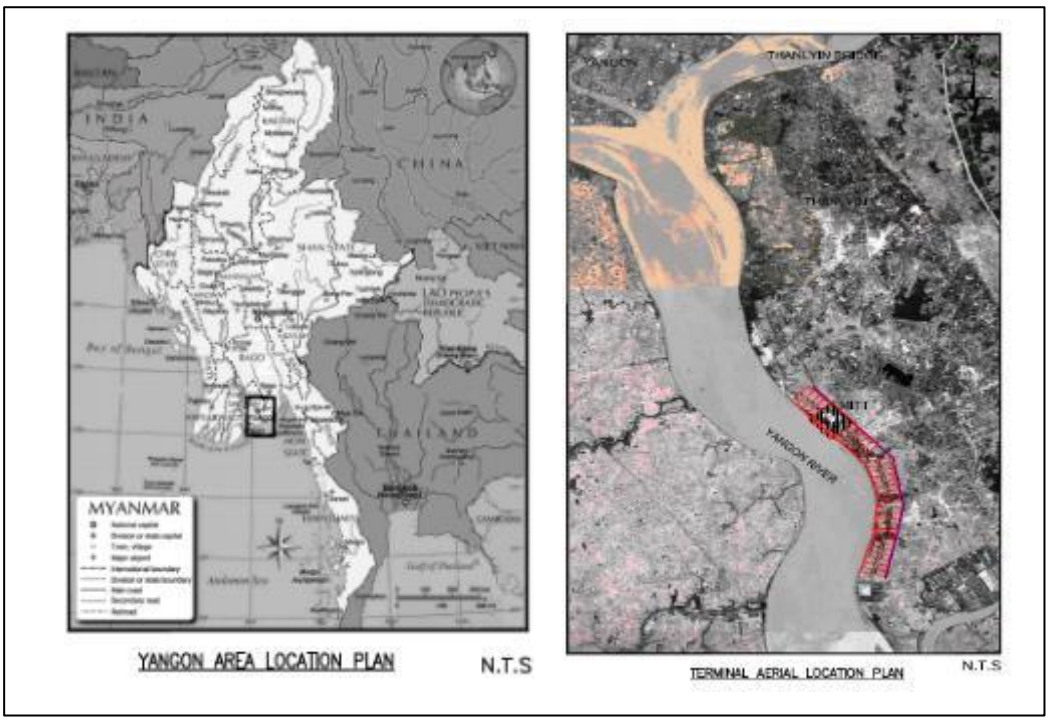
## 3.1 Project Mission

The mission of MITT is to be the leading port and terminal operator in Myanmar, committed towards providing high quality services to meet customers' needs, enhancing the well-being of employees, ensuring consistent returns to our shareholders and meeting the needs of our changing society.

## 3.2 Project Outline

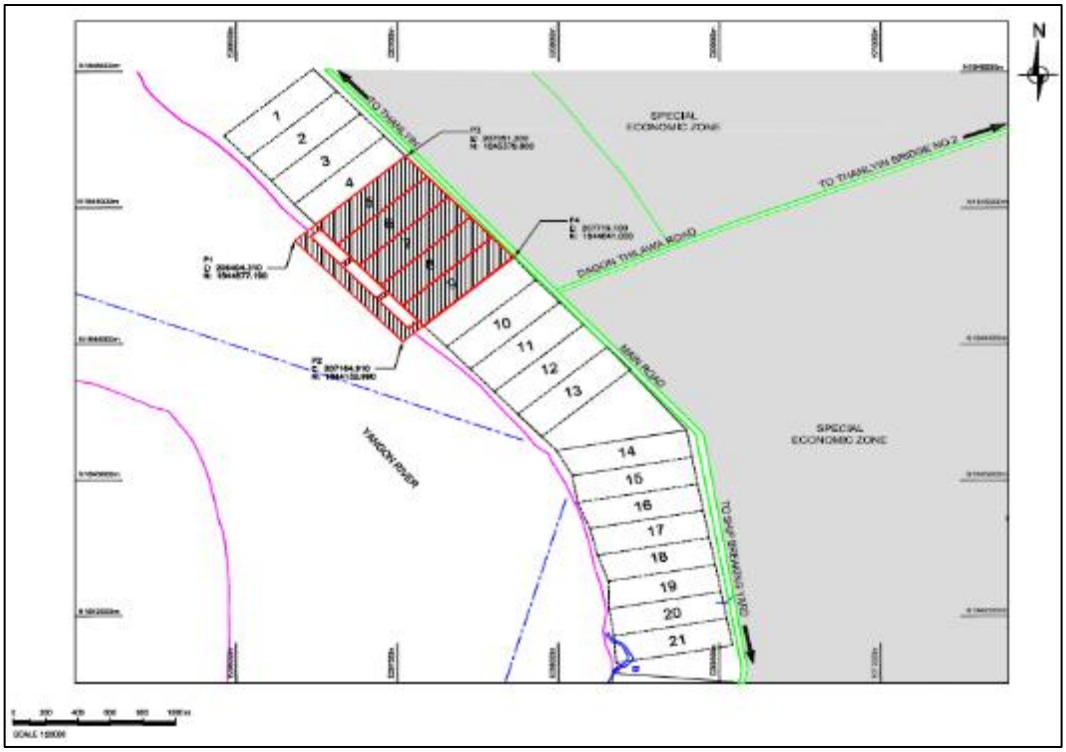
### 3.2.1 Project Location

Thilawa Area Port is comparted from Plot 1 to Plot 37, and Project Site is located from Plot 5 to Plot 9 as shown in Figure 3.2-2 and Figure 3.2-2. From the aspects of not only future demands commercial issues, technical issues but also environmental and social considerations, the terminal location was optimum based on an appraisal of all aspects. The project started construction in 1995 and officially opened on 9th November 1997. The terminal started running commercially on 1st March 1998. The total area of MITT is about 75ha (185 acres) and total berth length is 1000 meters with the berthing capacity of maximum 5 vessels which have maximum 9m draught.




Source: MITT

**Figure 3.2-1 Location of MITT Area**




Source: MITT

**Figure 3.2-2 Location Map of MITT**

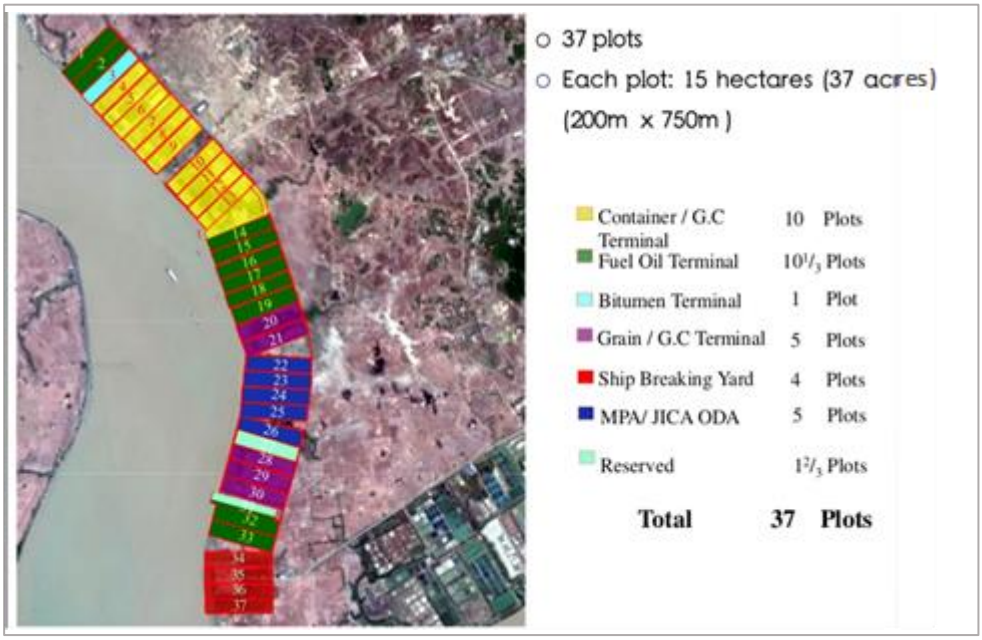
Source: MITT

**Figure 3.2-3 Bird's Eye View of MITT Limited (as of December 2019)**

### 3.2.2 Description of Surrounding Areas of the Project

Myanmar International Terminals Thilawa (MITT) Limited is located in Plot No. 5-9 among 37 plots in Thilawa Port Area comprising with various types of terminals such as Container/ General Cargo (G.C) Terminals, Fuel Oil Terminals, Bitumen Terminal, Grain/ G.C Terminals, MPA/ JICA ODA Terminal and Ship Breaking Yard, etc. (see in below

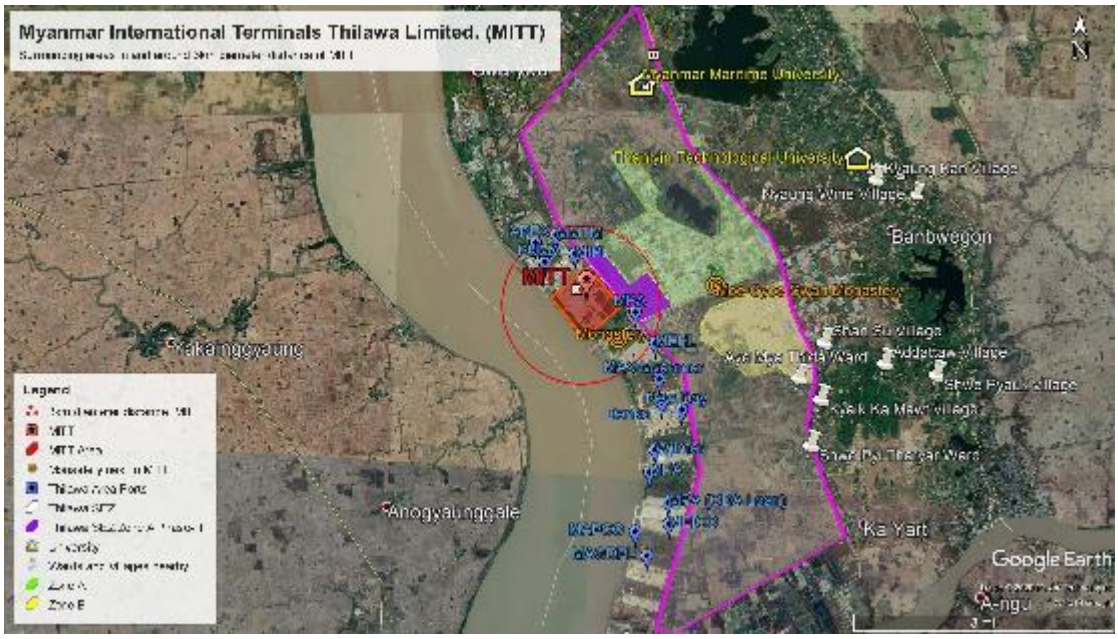
Figure 3.2-4).




Source: MPA

**Figure 3.2-4 Development of 37 Plots in Thilawa Port Area**

Within 3km radius distance from the project, Thilawa SEZ (Zone A and B), Fuel Oil Terminals, Container Terminals and Grain/ G.C Terminals in Thilawa Port Area, and Moe Kyo Swan Monastery, etc. are located as shown in Figure 3.2-5. Other wards, villages, universities and monasteries shown in the figure are far enough from the project site and the distances from the project site and surroundings are provided in Table 3.2-1.



Source: Google Earth (Prepared by EMP Study Team)

**Figure 3.2-5 Location of Surrounding Areas of MITT**

**Table 3.2-1 Distance between MITT and Its Surroundings**

| No. | Name | Direction from the project site | Distance from the project site |
|---|---|---|---|
| 1. | Monastery next to MITT | SE | 0.90km |
| 2. | Moe Kyo Swan Monastery | E | 2.55km |
| 6. | Aye Mya Thida Ward | SE | 4.50km |
| 7. | Shwe Pyi Tharyar Ward | SE | 5.35km |
| 8. | Thida Myaing (Ka Yart) Ward | SE | 6.85km |
| 9. | Shan Su Village | SE | 4.73km |
| 10. | Addattaw Village | SE | 5.90km |
| 11. | Kyaik Ka Mawt Village | SE | 5.07km |
| 12. | Shwe Pyauk Village | SE | 6.88km |
| 13. | Kyaung Kan Village | NE | 5.73km |
| 14. | Nyaung Wine Village | NE | 6.38km |
| 15. | Myanmar Maritime University | NE | 4.40km |
| 16. | Thanlyin Technological University | NE | 3.25km |
| 17. | Thilawa SEZ Zone A | E | 0.70km |
| 18. | Thilawa SEZ Zone B | E | 2.50km |

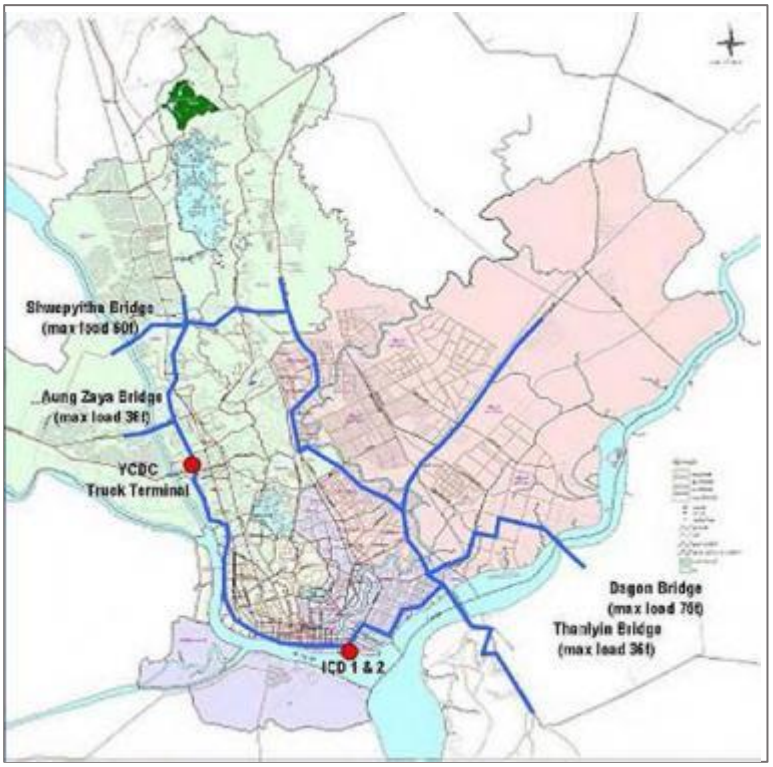
Source: EMP Study Team

### 3.2.3 Transportation Access

MITT is located just 25km from Yangon City, the largest commercial city of Myanmar and international trade portal which handles 90 percent of national maritime trade. MITT has direct access to industrial zones in Yangon such as Hlaing Thar Yar IZ, Shwe Pyi Thar IZ, South Dagon IZ, Mingaladon IZ, East Dagon IZ, etc. by means of road transportation. As shown in Figure 3.2-6 of road networks of Yangon City there are five major roads running in the north direction, only one road extending to the south.

There are two main routes, Yangon-Thanlyin Bridge (Thanlyin Bridge 1) and Dagon Bridge (Thanlyin Bridge 2) connecting from Yangon city to Thilawa area. Yangon-Thanlyin Bridge opened in 1995 is a combined bridge with road (two round trip lanes only) and railway systems and limited load is 36 tons (currently permissible load is 20 tons). Dagon Bridge opened in 2007 has total six round trip lanes with limited load of 75ton. Yangon-Thanlyin Bridge is important for urbanization, economic activities and logistics, and hinterland development, etc. But due to the load limitation and few numbers of lanes in Yangon-Thanlyin Bridge, trailer trucks carrying logs and containers have been using Dagon Bridge for transportation. Figure 3.2-7 shows transportation routes from/ to Yangon City and Thilawa area.

In terms of railway system, there is only a single-track railway between Yangon and Thilawa area in which the rail line ends up around MITT in Thilawa area. This rail route is used by commuter and work rolling stock sometimes. Figure 3.2-8 shows the rail route from Thilawa area to Yangon.




Source: The Project for the Strategic Urban Development Plan of the Greater Yangon

**Figure 3.2-6 Road Networks of Yangon City and Thilawa for Container Trucking**

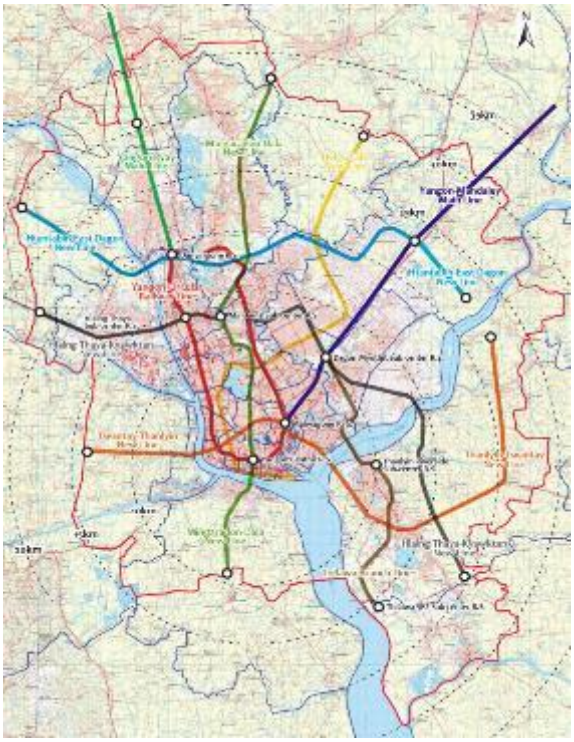

Source: Google Earth (Prepared by EMP Study Team)

**Figure 3.2-7 Road Routes from/ to Yangon City and Thilawa area**


Source: Google Earth (Prepared by EMP Study Team)

**Figure 3.2-8 Rail Route from/ to Yangon City and Thilawa area**

According to JICA Study of "The Project for Strategic Urban Development Plan of the Greater Yangon", it was noted that a future MRT development plan which plans to construct new 5 railway lines (232 km) covering Thilawa area is also being examined (see in Figure 3.2-9). Tunnel construction of about 800 m over the Yangon River will be necessary to accommodate railway line which is included in the underground railway development in the future.



Source: JICA Study Team (The Project for Strategic Urban Development Plan of the Greater Yangon)

**Figure 3.2-9 Yangon Development Conceptual Plan (2040)**

# 3.3 Project Alternatives

## 3.3.1 Zero Option Alternative

The Myanmar Government has currently shifted its approach to grow the country's economy by allowing more foreign investments and opening its doors to tourism and international business partners. With the growth in these two areas, the country expects more international trade to happen especially in the field of import and export. Since there was no international container-based multi-purposed terminal across Myanmar until 1995 and port development projects are playing an important role for country's economy, it was indicated that there will be an increase in imports and exports in the future and international container terminal developments will be necessary in the country.

The alternatives that will be presented in this report will be the "Zero Option" (or "Conditions without the Project") and "Conditions with the Project". The evaluation of alternatives for Zero Option and Conditions with the Project is shown in Table 3.3-1.

**Table 3.3-1 Study of Zero Option Alternative**

| Aspect | Conditions without the Project | Conditions with the Project |
|---|---|---|
| Location Aspect | • Due to the limited space of Yangon Main Port (downtown area), Yangon Main Port in downtown area may not be able to handle the increase of import and export demands from new business developments in Myanmar such as the Thilawa SEZ and other industrial zones. | • MITT has been developing as a new container-based multipurpose terminal in Thilawa area near the Yangon river estuary to be able to handle future increment of import and export goods from Thilawa SEZ and other businesses nearby. |
| Technical Aspect | • Random port development might be implemented without any concrete plan for overall project development. This can lead to restrict further development plant after disorderly and undisciplined development.<br>• Due to the limitations of inner bar, only the vessels with the dimensions of maximum 167m LOA and 9m draft and 15,000 DWT can enter the Yangon main port in downtown area. | • The Project has been developing efficiently and systematically in accordance with and by adhering to the laws and rules enacted by MONREC and the Republic of the Union of Myanmar.<br>• MITT port is very first international container terminal in Myanmar and sea going vessels which has maximum 9m draft and 35,000 DWT can accommodate at the port without consideration for limitations of inner bar. |
| Economic Aspect | • Job opportunities for local people would not be increased without the development of infrastructures such as the proposed project in their surroundings.<br>• Regional economic development and development of overall Thilawa SEZ would be limited.<br>• Congestion in the Yangon Main Port can potentially minimize the economic development due to slow movement of goods to and from the Yangon main port and the customers. | • Job opportunities would be increased for local people around the Project due to port infrastructure development.<br>• Local economy will be boosted to a certain extent and their life style will also be improved due to the regional infrastructure development.<br>• The efficient and effective trade of imports and exports through MITT can attract more local and foreign investments in Thilawa SEZ or in Myanmar. |
| Environmental and Social Aspect | • Vehicle movement and traffic would not increase in access roads to Thilawa area if the projects are not developed in Thilawa.<br>• Issues on environmental and social considerations might be more complicated and segmented in case of random Project development is conducted. | • Vehicle movement and traffic can increase more or less due to the increment of port related vehicles along Thilawa access roads, but concrete traffic management plan has been implemented by MITT.<br>• Operation of Project can cause impact on natural & social environment & cause pollution more or less.<br>• Disciplined and deliberate project development would make the solutions of possible issues on environmental and social |

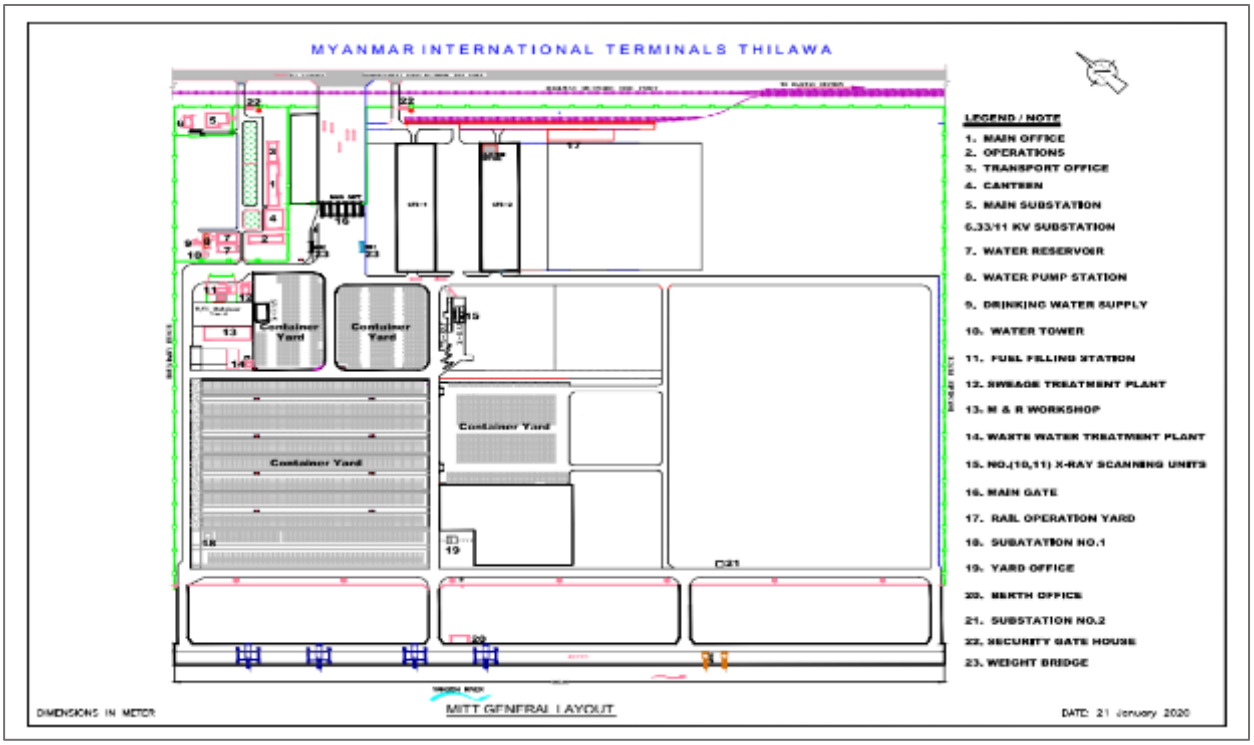
| Aspect | Conditions without the Project | Conditions with the Project |
|---|---|---|
| | | considerations to be effective and comprehensive.<br>• Living environment for local communities can be improved due to the development of surrounding infrastructure. |

Source: EMP Study Team

Based on "Zero Option/ Conditions without the Project" is not a favorable choice for economic development of Myanmar as it does not support the Government' strategies on economic development targeting on direct foreign investments. "Conditions with Project" is a better alternative somehow as international maritime trade between Myanmar and foreign countries can be developed and increased foreign incomes through port industry. The addition and proximity of port development to the local areas will also make mostly positively impact on regional development and economy resulting in enhancing the life styles of local people in terms of technology, increment of job opportunities in port related works. Therefore, in general, the option of MITT port development in Thilawa area is more favorable for the aspects of location, technical, environmental and socio economic benefits of the area.

## 3.4 Project Layout and Facilities

MITT Port comprises various facilities such as berthing facilities, cargo handling facilities and equipment, buildings, port operation facilities and auxiliary facilities. The general layout plan of the project including all project facilities is shown in Figure 3.4-1 (clear view of layout is attached in Appendix-3) and the descriptions of each facility are mentioned in below sections.




Source: MITT

**Figure 3.4-1 General Layout Plan of MITT (as of January 2020)**

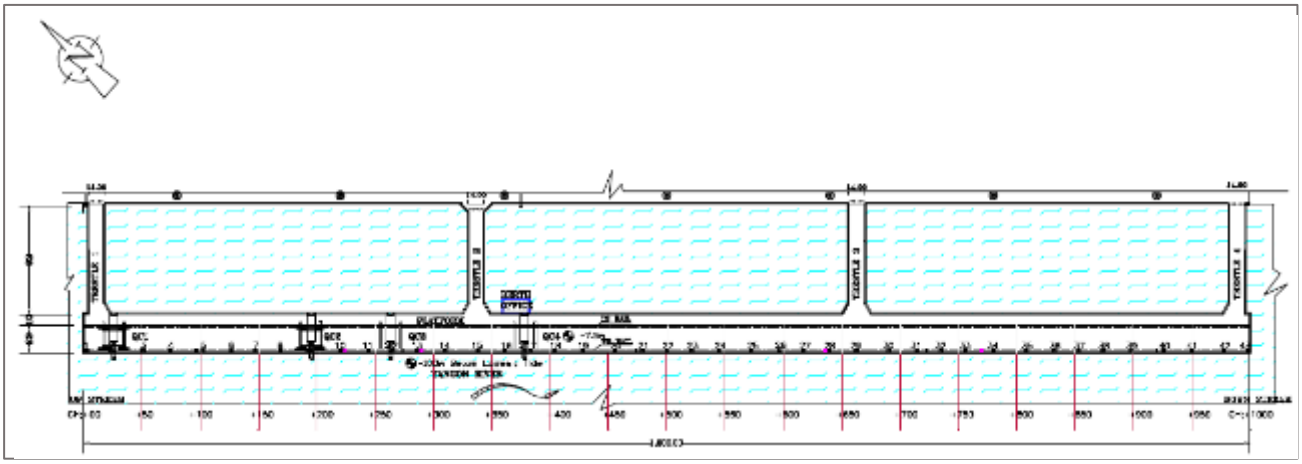
### 3.4.1 Berthing Facilities

The list and description of berthing facilities of MITT are mentioned in Table 3.4-1, while layout plan and design section of batter pile type jetty are shown in Figure 3.4-2 and Figure 3.4-3. Layout plan and illustrative photos of container yard areas are shown in Figure 3.4-4 and Figure 3.4-5 respectively. Full view of drawings of jetty, trestle, container yard areas are attached in Appendix 3.

**Table 3.4-1. List and Description of Port Berthing Facilities**

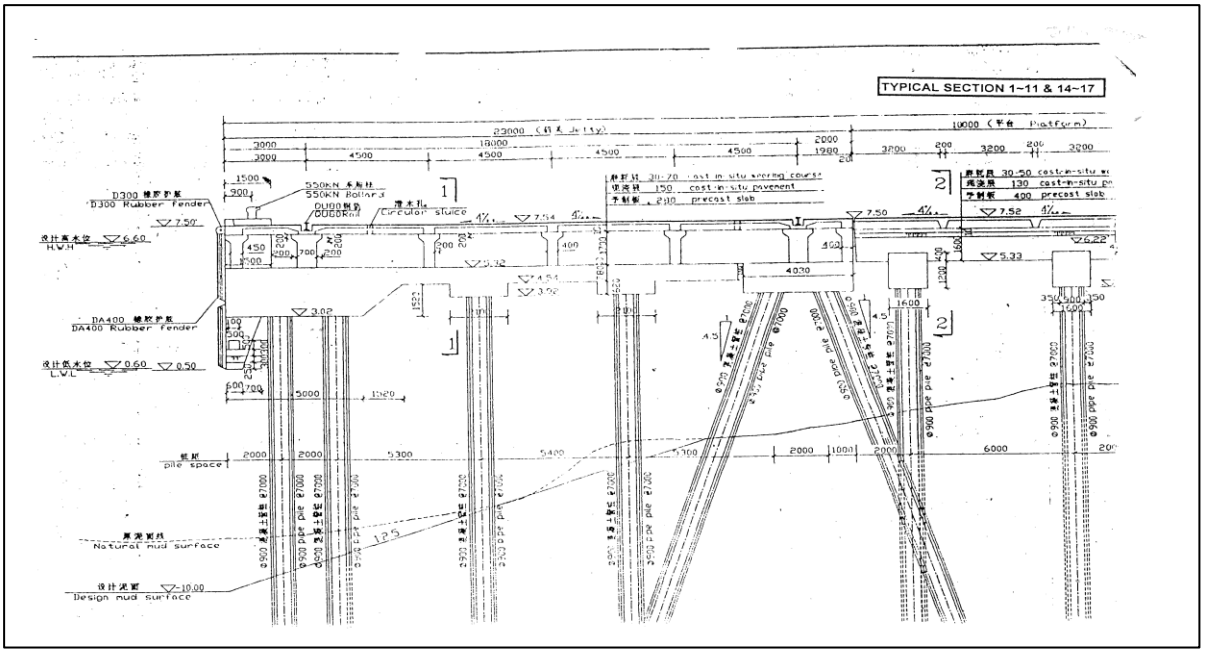
| Component | Description |
|---|---|
| Berth/ Jetty (5 units) | • Total berth length 1000m, Apron width 30m, Depth Alongside 10m accommodating container and general cargo berth and adapted for ship-to-shore (STS) gantry cranes and mobile harbor cranes.<br>• The berth/ jetty is Batter Pile Type constructing in situ using a vibro-hammer (not pile driven). |
| Trestle | • Size (Length 92m x Width 14m)<br>• Total four trestles perpendicular to the shore. |
| Container Yard | • Full Container Yard (FCY)<br>• Empty Container Yard (ECY)<br>• Reefer Container Yard<br>• Dangerous Cargo Yard<br>• Car Yard<br>• Rail Operation Yard |
| Types of berthing ships | • Container Ship<br>• General Cargo Ship (Bulk Carrier, RO-RO, Cruise, etc.) |
| Maximum Handling Capacity of ships | • 2,000 TEU for container ships<br>• 35,000 DWT for general cargo ships |
| Cargoes to be handled | • Containerized cargoes (e.g. machinery parts, loose metal, drummed cargo, boxes, etc.)<br>• Non-containerized cargoes (e.g., copper plate, steel structures, draw back machinery, , cement, fertilizers, cars, heavy machineries, project cargoes, etc.)<br>• Refrigerated cargoes (e.g. meats, fruits, dairy products, etc.)<br>• Dry bulk cargoes (e.g. rice, grain, iron, ore, coal, sugar, wheat, etc.) |

Source: MITT (Prepared by EMP Study Team)



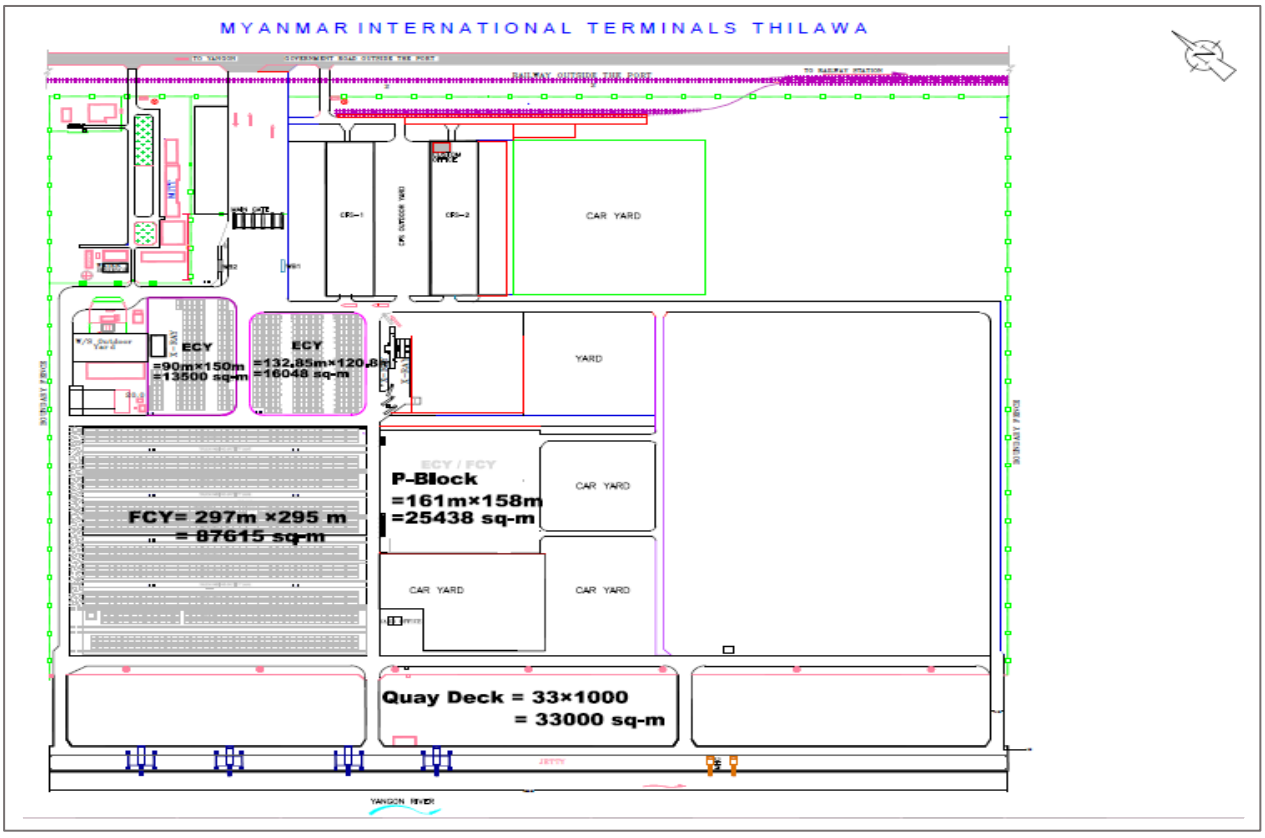
Source: MITT

**Figure 3.4-2 Layout Plan of Berth/ Jetty**




Source: MITT

**Figure 3.4-3 Cross-Section Layout of Jetty**




Source: MITT

**Figure 3.4-4 Layout Plan of Yard Areas of MITT (as of 26 November 2019)**

Full Container Yard (FCY)

Reefer Container Yard

Empty Container Yard (ECY)

Dangerous Cargo Yard

Car Yard

Rail Operation Yard

Source: MITT

**Figure 3.4-5 Illustrative Photos of Yard Areas at MITT**

Container Ship

General Cargo Ship

Bulk Carrier

Cruise Ship

Ro/ Ro Ship

Source: MITT

**Figure 3.4-6 Illustrative Photos of Types of Berthing Ships at MITT**

### 3.4.2 Cargo Handling Facilities

Cargo handling facilities of MITT include heavy equipment such as cranes, reach stacker, forklift, trailers, tractors and trucks, etc. for loading and unloading of containers and cargoes from ship to shore and vice versa. The list of cargo handling facilities, usages, specifications and operational performances are described in Table 3.4-2.

**Table 3.4-2. List and Description of Cargo Handling Facilities**

| Sr. No. | Equipment Name | Specification & Fuel Usage | Capacity | Quantity | Operational Performance | Photos of equipment |
|---|---|---|---|---|---|---|
| 1. | Quay Crane (High Profile QC) | ZPMC Quay Crane (Electricity usage) | 40 tons | 2 | -These cranes use spreader for unloading shipping containers from sea-going vessels onto the external trucks or in-land shipping barges for delivery and for loading cargoes from trucks or barges onto the vessels.<br>-Loading/ Unloading of containers from container ship to other (chasis, automated guided vehicle), and vice versa. The detailed process is as follows:<br>- QC spreader is put on the container, fixed by twist locks and lifted by a hoist for unloading. The trolley of crane moves the container to the quay where spreader is lowered and then the container is placed on the ground (wharf) or transport vehicle either.<br>-In practice, QCs can be able to realize about 24-30 moves per hour. |  |
| | | ZPMC Quay Crane (Electricity usage) | 41 tons | 2 | | |
| 2. | Mobile Harbour Crane | Gottwald Mobile Harbour Crane HMK 260E (Diesel usage) | 35 tons | 1 | - Mobile harbour canes are used as a back-up for conventional dock cranes, to handle special loads and when additional terminal capacity is required.<br>-They are often used in place of conventional cranes as they are more flexible and require less investment in quayside infrastructure such as rails and power infrastructure.<br>-The lifting gear can be easily interchanged including grabs, spreaders, C-hooks, slings, chains, magnets and lifting beams.<br>-Suitable for barge/coaster (80-500TEU), Feeder (300-1,200TEU) and Standard (1,000-2,500TEU).<br>-Can be flexible, reliable and rapid discharging of containers, all types of bulk and general cargoes, pallets and heavy loads (project cargo) |  |
| | | Gottwald Mobile Harbour Crane HMK 170E (Diesel usage) | 35 tons | 1 | | |

| Sr. No. | Equipment Name | Specification & Fuel Usage | Capacity | Quantity | Operational Performance | Photos of equipment |
|---|---|---|---|---|---|---|
| 3. | Rubber Tyre Gantry (RTG) Crane | ZMPC Rubber Tyre Gantry Crane | 40 tons | 8 | -RTG is used to handle containers at loading/ unloading places and stack in container storage yards.<br>-It is fitted with multiple hooking point's spreader to meet the needs of different lifting situations.<br>-The whole crane can carry outwith flexible movement by its own rubber tyres for transshipping containers. |  |
| | | Noell Rubber Tyre Gantry Crane | 40.6 tons | 4 | | |
| 4. | Front Loader | Kalmer DC 13.6 EC5 (Empty Handler) (Diesel usage) | 7 tons | 1 | -Empty handlers are equipped with straight six cylinder turbo charged engines equipped with intercooler. Engines have low exhaust level and low fuel cosumption.<br>-Lifting speed unloaded (0,50m/s), at rated load (0,45m/s)<br>-Lowering speed unloaded (0,40 m/s), at rated load (0,40)<br>-Travelling speed, forward-reverse, unloaded/ at rated load (29 km/h)<br>-Noise and vibration levels are low due to the insulated mounting to the chassis.<br>-Pre-selected lifting height, automatic gearing, to ergonomics functions such as joystick control and min-steering wheel as well as further functions are included for safety improvement. |  |
| | | Sany SDCY90K7H1 (Empty Handler) (Diesel usage) | 9 tons | 2 | | |
| | | Kalmer DC 4160 RS5 (Reach Stacker) (Diesel usage) | 40 tons | 2 | -Heavy duty handling of 20'-40' loaded containers.<br>-Built with chassis which has high strength and torsional stiffness and an extremely low centre of gravity.<br>-The operator's cab is provided with vibration isolation and sound insulation and offers excellent all-round visibility. |  |
| | | Sany SRSC 45 H1 (Reach Stacker) (Diesel usage) | 45 tons | 4 | | |
| 5 | Forklift | Komatsu Forklift 3 Tons | 3 tons | 5 | -Forklifts have been ergonomically designed so that every operator can use the machines without strain, reducing fatigue and maximizing their output. | |
| | | TCM Forklift 3.5 Tons | 3.5 tons | 4 | | |
| | | TCM Forklift 10 Tons | 10 tons | 5 | | |

| Sr. No. | Equipment Name | Specification & Fuel Usage | Capacity | Quantity | Operational Performance | Photos of equipment |
|---|---|---|---|---|---|---|
| | | TCM Forklift 15 Tons | 15 tons | 1 | -Clean, efficient and economical and capable of transporting loads with minimal noise and vibration. |   |
| 6 | Terminal Tractors | Ottawa YT 50 Commando Tractor | 40 tons | 6 | -Tractors have been designed specially for efficient use in ports and container terminals, distribution and logistic centres as well as industrial sites, fullfilling the demands of that specific work environment.<br>-Tractors are equipped with a Diesel Particulate Filter (DPF) as part of its exhaust aftertreatment system. DPF traps diesel particulates and requires periodic seervice to ensure its proper functionality.<br>-The cabin is very large and well-lit, with perfect visibilitym and ergonomics are also excellent for the operator. Moreover, all machine's elements are visible, allowing the operator to perform daily maintenance of the tractor in a very short tiime frame. |  |
| | | Kalmar Tractor | | 14 | | |

| Sr. No. | Equipment Name | Specification & Fuel Usage | Capacity | Quantity | Operational Performance | Photos of equipment |
|---|---|---|---|---|---|---|
| 7 | Terminal Trailer | Low Bed Trailer (40 ft) | 40ft | 3 | -Include twist locks (four, eight or twelve pieces which are lifting type or screw type)<br>-Offer the ability to carry legal loads up to 12ft (3.66m) tall, which other trailers cannot and weight capacity is 70,000lbs.<br>-Use to haul heavy equipment and special cargo such as bulldozers, cars and industrial equipment, etc. which are transported by bulk cargo ship/ RO-RO. |  <br>  |
| | | Terminal Trailer (20ft) | 20ft | 3 | -Use to transport ISO containers ranged from 20ft-40ft in length in port areas.<br>-Brackets mounted on the trailer keep the container in place for roadway travel.<br>-Standard capacity of 40ft trailer is from 2400 to 2700ft$^3$. |  <br>  |
| | | Terminal Trailer (40ft) | 40ft | 27 | | |
| 8 | Trailers (Old) | Trailer (40ft) | 40ft | 8 | | |
| | | Trailer (20ft) | 20ft | 1 | | |
| 9 | Transporter | Nissan Transporter with Soon Wing Trailers | 40tons/ 40ft | 6 | -Use for transshipment of cargo and containers from port to cargo recipient. | |
| | | Shacman O'Long Tractor with Trailers | 40tons/ 40ft | 40 | | |

| Sr. No. | Equipment Name | Specification & Fuel Usage | Capacity | Quantity | Operational Performance | Photos of equipment |
|---|---|---|---|---|---|---|
| | | Shacman O'Long Tractor with Trailers | 40tons/ 20ft | 10 | |  |
| | | Chenglong Tractor with Trailers | 40tons/ 20ft | 15 | | |
| | | Chenglong Tractor with Trailers | 40tons/ 40ft | 14 | | |
| | | Trailers (20ft) | 20ft | 4 | | |
| | | Foton Tractor with Trailers | 40tons/ 40ft | 12 | | |
| | | Terminal Trailers | 40ft | 8 | | |

Source: MITT (Prepared by EMP Study Team)

### 3.4.3 Buildings and Utilities

MITT port terminal includes administration buildings, operation-related buildings and utilities, security and communication facilities, etc. The brief description and photos of these buildings and utilities installed in MITT are listed in Table 3.4-3.

**Table 3.4-3. Buildings and Utilities installed in MITT**

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 1 | Main Office | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 2 | 30 & 36 | 12 &14 | 6 | 1728 | 1 unit |  |
| 2 | Operations Building | R.C Structure, Brick wall, Concrete floor, R.C roof slab | 2 | 45 | 12 | 6 | 1080 | 1 unit |  |
| 3 | Transport Office | R.C. Structure, Brick wall, Concrete floor, R.C Roof Slab | 2 | 30 | 12 | 6 | 720 | 1 unit |  |

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 4 | Marine Berth Office | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 21 | 6 | 3 | 126 | 1 unit |  |
| 5 | Yard Office | Modular Container Structure | 1 | 12 & 6 | 6 & 6 | 3 | 108 | 1 unit |  |
| 6 | Canteen Building for staff | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 30 | 24 | 5 | 720 | 1 unit |  |

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 7 | Canteen Building for stevedores | Brick Noggin Building, Brick Wall, Concrete Floor, CGI Sheet Roof | 1 | 24 | 9 | 3 | 216 | 1 unit |  |
| 8 | Security Gate House | R.C Structure , Brick Wall , Concrete Floor, R.C Roof Slab | 1 | 7.8 | 3.3 | 3 | 26 | 2 units |  |
| 9 | Terminal Gate | Steel Structure , Aluminium Frame Duty Room ,Metal Sheet Roof, Concrete Floor | 2 | 52 | 20 | 9 | 2080 | 6 Duty Rooms |  |

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 10 | Container Freight Station (CFS) | Steel structure with metal sheet cladding, Paver block flooring | 1 | 200 | 50 | 7 | 10000 | 2 units |  |
| 11 | No. (10 & 11) X-Ray Scan Unit | RC Wall & Structure Building | 1 | 26.4 | 13 | 8 | 343 | 2 units |  |
| 12 | Truck Scale | R.C Pit & Steel Structure | 1 | 18.86 | 3.5 | 1 | 66 | 2 units |  |

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 13 | Fuel Filling Station | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 18 | 6 | 5 | 108 | Porch 108*9.5 |  |
| 14 | M&R Workshop | R.C. Structure, Brick wall, Concrete floor, Pile Foundation, Steel truss & Metal Sheet Roof | 1 | 60 | 21 | 11 | 1260 | 1 unit |  |
| 15 | Office Car Shelter | Steel structure Open Shed | 1 | 18 | 6 | 4~3.5 | 108 | 2 units |  |

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Unit/ Capacity | Picture |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | | |
| 16 | Ferry Bus Parking Shed | Steel structure Open Shed | 1 | 29 & 19.2 | 8 & 8 | 4~3.5 | 385.6 | 2 units |  |

Source: MITT

### 3.4.4 Auxiliary Facilities

MITT's auxiliary facilities include power supply facilities, generators, water supply facilities, drinking water treatment plant, sewage treatment plant and wastewater treatment plant, etc. and are listed in Table 3.4-4.

**Table 3.4-4 List and Description of Auxiliary Facilities**

| Sr. No. | Description | Constructed Design | No. of Storey | Dimension(m) | | | Floor Area (m2) | Remark |
|---|---|---|---|---|---|---|---|---|
| | | | | L | B | H | | |
| 1 | Main Sub Station | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 28 & 17 | 17 & 4.5 | 4.63 | 553 | 2m depth U/G Cell |
| 2 | 33/11kV Sub Station | R.C. Structure, Brick wall, Concrete floor, Timber truss & Metal Sheet Roof | 1 | 16.25 | 9 | 4.26 | 146 | 1.5m depth U/G Cell |
| 3 | Sub Station 1 | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 9 | 9 | 5 | 81 | 2m depth U/G Cell |
| 4 | Sub Station 2 | R.C. Under Ground Cell, Outdoor type compacted Sub station | 1 | 7 | 4 | 1.7 | 28 | 2m depth Cell |
| 5 | Water Reservoir | R.C. Structure (1000 Ton Capacity) | - | 22.8 | 11.4 | 4 | 260 | 2nos |
| 6 | Pump House | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 20.5 | 5 | 4 | 103 | 2.6m depth cell |
| 7 | Water Tower | R.C. Structure, Pile Foundation (200 Ton Capacity,30m Head) | - | Core2.0 40,roof 10.50 | | 30 | | 200 ton capacity |
| 8 | Drinking Water Treatment Plant | Brick noggin wall, Concrete floor, Metal sheet roofing | 1 | 8.5 | 8.2 | 4.7 | 70 | 30$m^3$ of drinking water supply per day |
| 9 | Sewage Treatment Plant | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 7.4 | 4.9 | 3 | 36 | 4.3m depth U/G Pit |
| 10 | Wastewater Treatment Plant | R.C. Structure, Brick wall, Concrete floor, R.C roof slab | 1 | 11.04 | 5.84 | 4.82 | 64 | Nil |
| 11 | Waste Disposal Site | Concrete floor, Steel Structure, Open shed | - | 9 | 5 | 3 | 45 | 3 chambers |

Source: MITT

#### (1) Drinking Water Treatment Plant

The raw water purchased from the Thilawa Dam is treated with the drinking water treatment plant to supply the safe drinking water at MITT Port. This treatment plant is designed by Supreme Water Doctor Co., Ltd. and consists of pumping, chlorine dosing, filtration, and sedimentation as shown in Figure 3.4-8. The purpose of the drinking water treatment plant is to remove and reduce the contaminants and disease-causing bacteria to provide the safe drinking water.

In the pre-treatment stage, the raw water is pumped through the PAC dosing unit, chlorine dosing unit, and 100 Micron plastic filter. Poly Aluminium Chloride (PAC) is dosed to the raw water in order to bring the small particles together to form larger particles called flocs as the flocculation step. The chlorine dosing unit that aims to disinfect the water and kill germs is installed after the PAC dosing unit. These chemicals are mixed into the water slowly to get better efficiency and the water flows through the 100 Micron plastic filter as the preliminary filtration. The treated water flows through the sand filter and carbon filter to remove the suspended impurities in water and enhances the effectiveness of disinfection. Then, it passes 5 Micron filter and it is stored in the pre-treatment water storage tank with the suitable detention time as primary

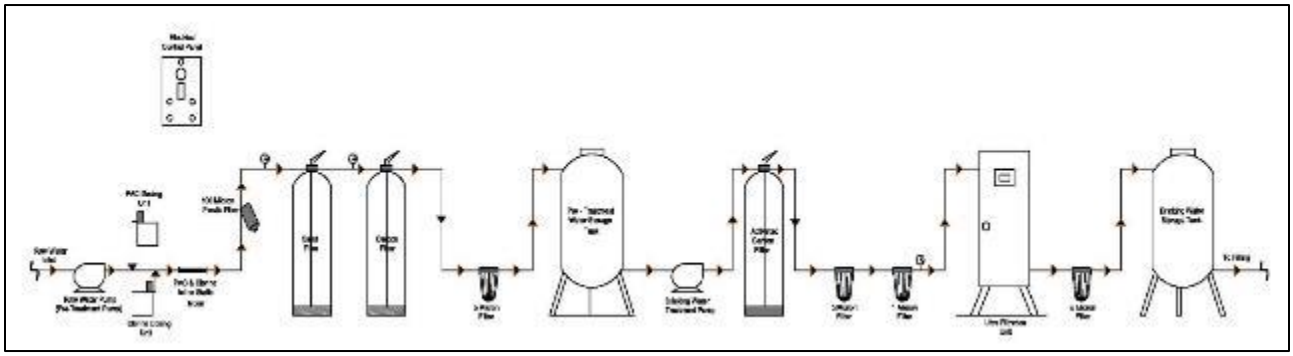
sedimentation treatment.

This treated water is pumped to the activated carbon filter to remove the remaining impurities and it passes through the 5 Micron filter and 1 Micron filter again. As the important stage of the treatment system, the ultra-filtration unit is equipped to remove essentially all colloidal particles (0.01 to 1.0 microns), bacteria, protozoa, some viruses and some of the largest dissolved contaminants from the water. The treated water flows through the 5 Micron filter as the final stage of the treatment. The treated water is stored in the drinking water storage tank to distribute the safe drinking water. The flow rate of the treatment plant is 2000 liters/hr and its flow chart is described in Figure 3.4-7. After treatment, the drinking water quality parameters are acceptable and satisfactory to drink under the range of WHO drinking water guideline as shown in Table 3.4-5. (Water quality test result forms are attached in Appendix-3.)

**Table 3.4-5 Analysis Results of Raw Water and Treated Drinking Water**

| Sr. No. | Parameter | Raw Water Quality (Before Treatment) | Drinking Water Quality (After Treatment) | WHO Drinking Water Guideline | Unit |
|---|---|---|---|---|---|
| 1 | pH | 7.4 | 7.2 | 6.5-8.5 | - |
| 2 | Color (True) | 5 | Nil | 15 | TCU |
| 3 | Turbidity | 8 | Nil | 5 | NTU |
| 4 | Conductivity | 60 | 67 | | micro S/cm |
| 5 | Total Hardness | 18 | 20 | 500 | mg/ L as $CaCO_3$ |
| 6 | Total Alkalinity | 2 | 28 | | mg/ L as $CaCO_3$ |
| 7 | Iron | 0.48 | 0.07 | 0.3 | mg/ L |
| 8 | Chloride (as Cl) | 4 | 6 | 250 | mg/ L |
| 9 | Total Dissolved Solids | 30 | 33 | 1000 | mg/ L |
| 10 | Salinity | 0.1 | 0.1 | | ppt |
| 11 | Chlorine (Residual) | Nil | Nil | | mg/ L |
| 12 | Total Coliform | | <1 | | CFU/100ml |
| 13 | Escherichia coli | | <1 | | CFU/100ml |

Source: MITT



Source: MITT

**Figure 3.4-7 Flow Chart of Drinking Water Treatment (2000 Liters/hr)**

Source: MITT

**Figure 3.4-8 Drinking Water Treatment System and Supply at MITT (2000 Liters/hr)**

### (2) Sewage Treatment Plant

The sewage treatment plant installed at MITT consists of step-by-step processes such as pumping, oxidation, sedimentation, disinfection, and sludge digestion as shown in Figure 3.4-9. Sewage indicates the liquid waste that includes sullage, discharge from toilets and urinals. It may contain a lot of suspended and floating materials, organic and inorganic wastes and numerous pathogenic or disease producing bacteria. The purpose of the sewage treatment plant is to remove pollutants by using physical, biological, and chemical processes.

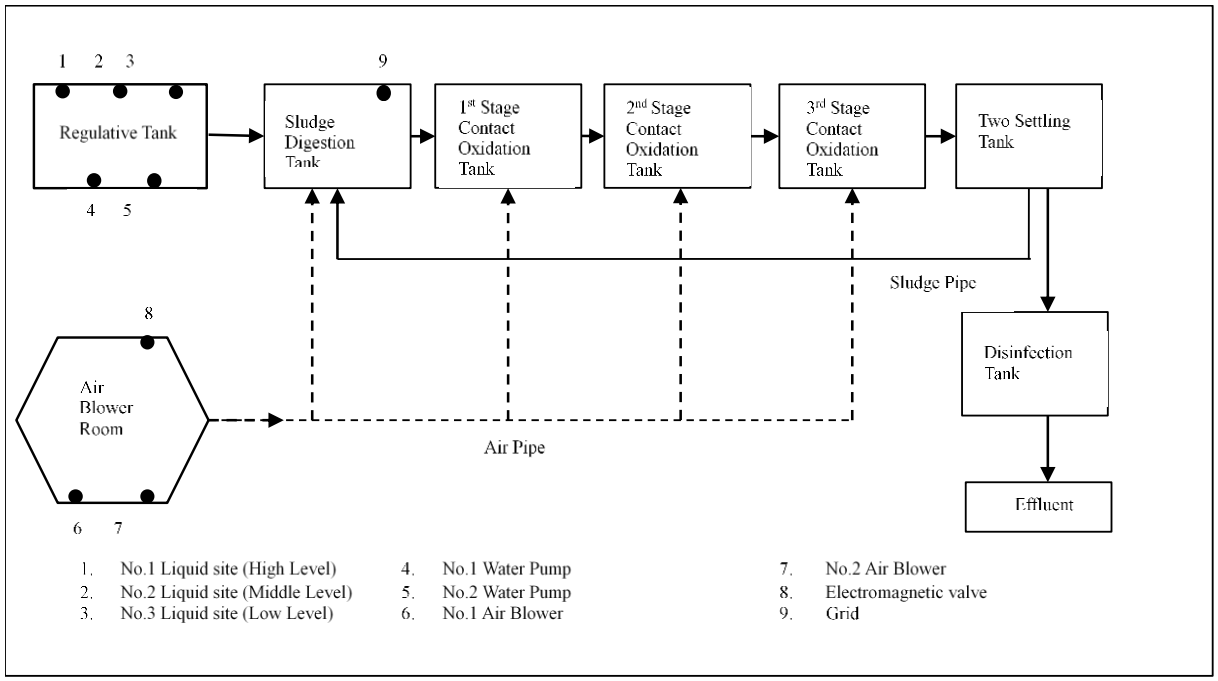
At the first stage of the treatment plant, the regulative tank provides a place to temporarily hold incoming sewage during plant maintenance and a means of diluting and distributing batch discharges of toxic or high-strength waste which might otherwise inhibit biological secondary treatment. And then, the sewage is pumped to the sludge digestion tank that initially aims to remove as much of suspended matter as possible before other treatment stages. The sewage entering to the three oxidation tanks is supplied oxygen to the aerobic bacteria by using two air blowers, resulting in the oxidation of the organic matter present in the tank. The effluent received from the final contact oxidation tank is non-putrescible, but is turbid and high in bacterial content. For better quality effluent, it is passed through two settling tanks to reduce the remaining suspended and colloidal organic matter. For the final stage of the treatment plant, it flows through the disinfection tank to remove the disease-causing organisms and the better-quality final effluent is finally emitted to the drainage. The second purpose of the sludge digestion tank is to subject the organic matter present in the settled sludge from the two settling tanks to anaerobic or aerobic decomposition so as to make innocuous and amenable to dewatering on sand beds or mechanical filters before final disposal. The entire flow chart of sewage treatment plant is described in Figure 3.4-10.

The designated treatment efficiency of the plant is to maintain the effluent quality in the range of 10~30 mg/L for BOD, 40~80mg/L for COD and 6.5~8.5 for pH level. The treatment plant is maintained so that there is not big block of substance in the sewage in case of the choking up of the pipes. The entrance holes of equipment are covered and the fillers in the contact basins are put tightly all the time. To maintain the blowers from damaging, their rotating direction needs to be right all the time. If sewage enters into the

blowers, they cannot be used until after changing the machine oil. The air valves are kept open before starting. Machine oil must be changed after 5 to 8-month usage, but especially just after 1 month for the first time. The two blowers run in turns every 6 hours in order to improve the longevity of the blowers. There cannot be water in the blower house and if that happened, they must be shut down immediately. When the sewage flow is blocked, the pressed water or air is used to flush the obstruction in the pipes or holes. If the blowers are overheated, the valves must be widened and another blower must be started. When the draining of the deposition basin is blocked because of accumulated sludge, the gas valve is opened and the basin is flushed with pressed air after blocking up the exits of the sludge basin. Shut down the return valves if the gas amount of blowers is inadequate.

Source: MITT

**Figure 3.4-9 Sewage Treatment Plant at MITT**




Source: MITT

**Figure 3.4-10 Flow Chart of Sewage Treatment Plant**

### (3) Wastewater Treatment Plant

TJQ 5T/h Air Floating Water Purifier is installed as wastewater treatment plant to treat wastewater generated especially from operation-related activities container washing activity. The treatment plant consists of pumping, chemical dosing, floatation, sedimentation, aeration, and filtration as shown in Figure 3.4-11. The wastewater may contain floating, dissolved, suspended and colloidal state of organic matter,

inorganic matter and living organisms. The objective of the wastewater treatment facility is to reduce the contaminants by using physical, chemical, and biological processes. Firstly, the container washing wastewater is collected in the preliminary settling tank. The wastewater is dosed with chemicals and pumped to the air floating tank in which the finely divided suspended solids and particles are removed from the scrap groove. The wastewater flows into the middle water box that can be alternatively used as the primary sedimentation tank. The effluent is pumped to the aeration tank where the grit particles settles down to the bottom of the tank at the rates dependent upon the particle size and their specific gravity. The heavier grit particles with their higher settling velocities drop down to the floor whereas lighter organic particles are carried to the air floating tank again.

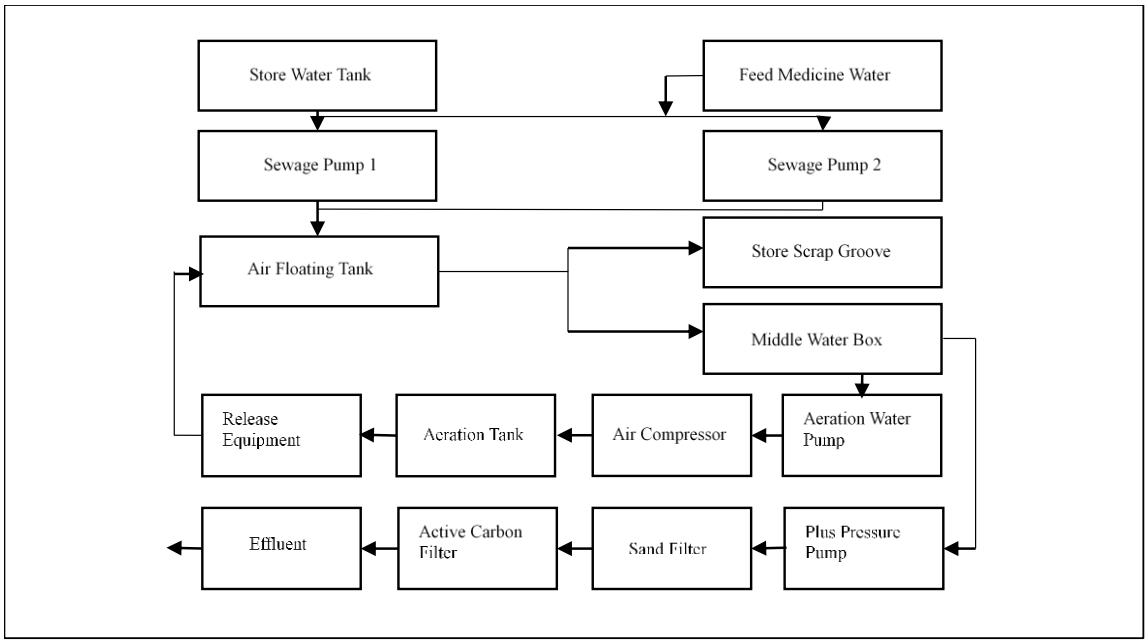
The effluent from the middle water box is pumped to the sand filter in which the suspended organic matter gets trapped in the voids of top portion of the sand, through straining action. During the rest period, the trapped organic matter is acted upon by aerobic bacteria present in the filter layer. These aerobic bacteria flourish well in the presence of free oxygen available from atmosphere during the rest period when the effluent has percolated down. The treated effluent flows through the active carbon filter as a final treatment stage to dispose the better-quality effluent to the natural waters.

During the period of starting and working, keep an eye on the readings of gauges, temperature of bearings, leaking and temperature of packing and the vibration and noise of the pump. The highest temperature of bearings permitted is not more than 80°C, and the temperature should not be 40°C higher than that of the surroundings. Little water leakage from packing is permitted, but no more than 15-50 drops per minute. The level of bearings lubricant oil should be kept in the middle of the oil indicator. If the clearance between sealing ring and impeller is wider than 0.5mm, the ring should be replaced.

The flow chart of operation wastewater treatment system is provided in Figure 3.4-12.

Source: MITT

**Figure 3.4-11 TJQ 5T/h Air Floating Water Purifier (Wastewater Treatment System)**

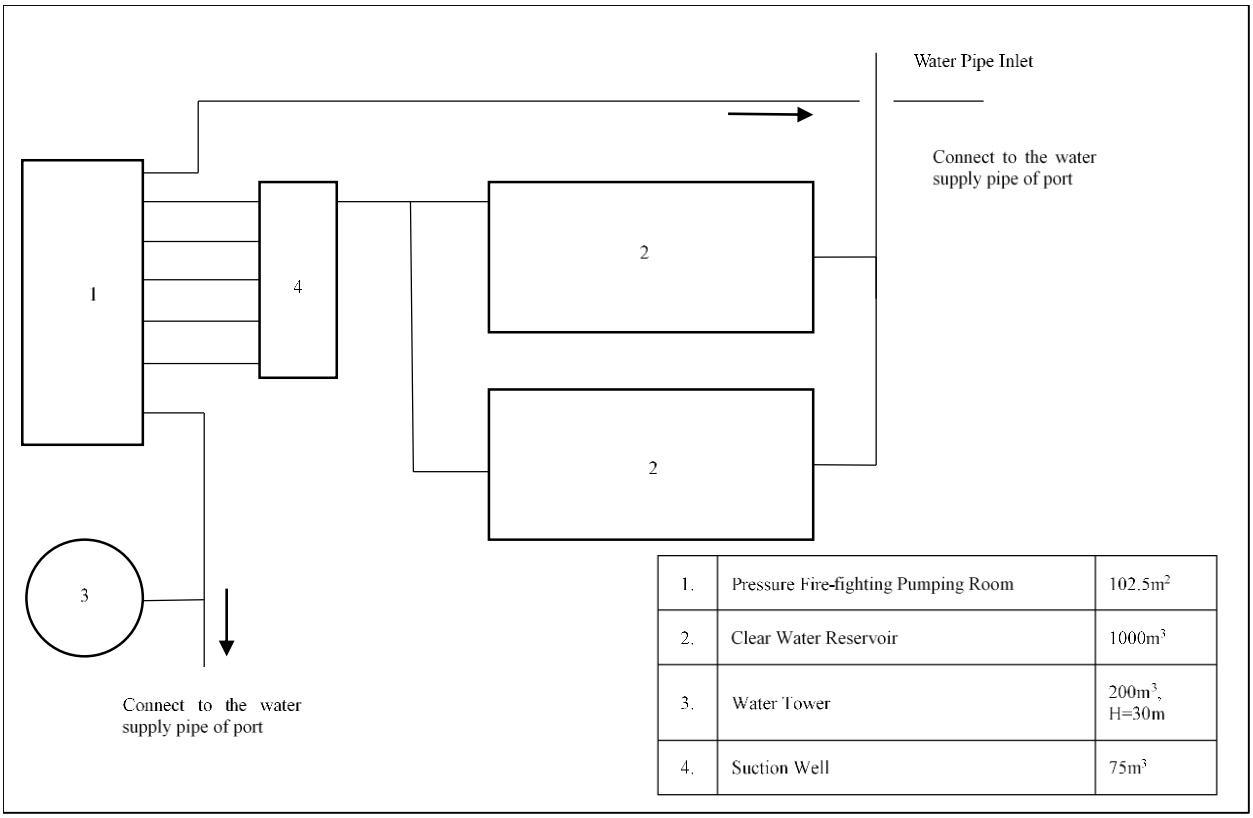



Source: MITT

**Figure 3.4-12 Flow Chart of TJQ Air Floating Water Purifier**

### 3.3.5 Water Resources and Consumption by Areas

The raw water purchased from the Thilawa Dam is used for ship water supply, drinking water supply, and water supply for domestic and port operation in MITT. The water purchased is mainly used for domestic and port operation, and the remaining amount is used for ship water supply with the constant drinking water supply amount of 50$m^3$ per month. Meanwhile, the drinking water usage of MITT is 30$m^3$ per month, and the remaining 20$m^3$ is used for the back-washing part of drinking water treatment system. The list of water consumption amount per month in 2018 and 2019 is described in Table 3.4-6. The water purchased is stored in the two clear water reservoirs with each capacity of 1000$m^3$ and the water tower with the capacity of 200$m^3$ and 30m height. The stored water is distributed to the water supply pipe of port by pumping in the fire-fighting pumping room. The suction well is kept standby for the emergency use. The flow chart of water supply system is shown in Figure 3.4-13. (The detail flow chart is attached in Appendix-3.)




Source: MITT

**Figure 3.4-13 Flow Chart of Water Supply System**

**Table 3.4-6 List of Water Consumption in MITT**

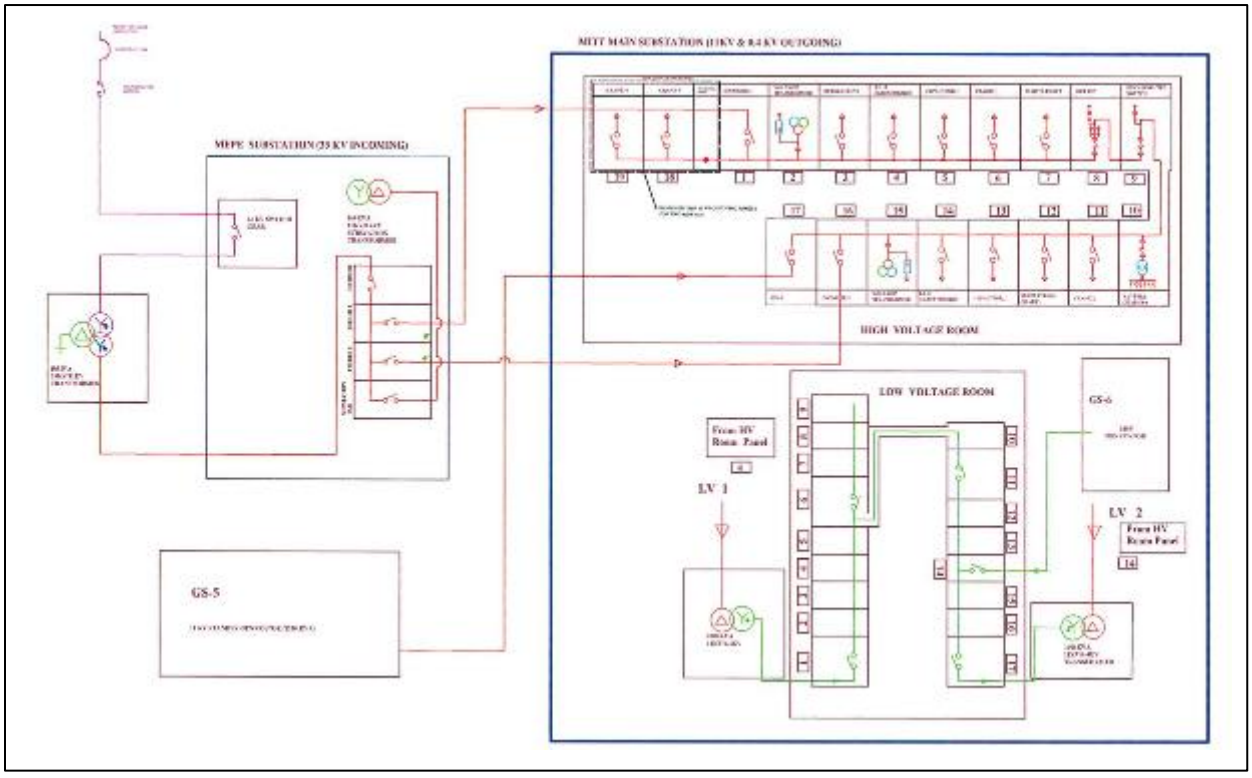
| Year | Month | Total ($m^3$) | Ship Supply ($m^3$) | Domestic & Port Operation($m^3$) | Drinking Water($m^3$) |
|---|---|---|---|---|---|
| 2018 | Jan | 7083 | 992 | 6041 | 50 |
| | Feb | 6017 | 1412 | 4555 | 50 |
| | Mar | 5545 | 1002 | 4493 | 50 |
| | Apr | 7526 | 2188 | 5288 | 50 |
| | May | 5306 | 730 | 4526 | 50 |
| | Jun | 6947 | 1488 | 5409 | 50 |
| | Jul | 6004 | 1625 | 4329 | 50 |
| | Aug | 3060 | 836 | 2174 | 50 |
| | Sep | 3930 | 711 | 3169 | 50 |
| | Oct | 2091 | 584 | 1457 | 50 |
| | Nov | 4843 | 2075 | 2718 | 50 |
| | Dec | 2772 | 1315 | 1407 | 50 |
| 2019 | Jan | 3599 | 350 | 3199 | 50 |
| | Feb | 5243 | 2183 | 3010 | 50 |
| | Mar | 3644 | 250 | 3344 | 50 |
| | Apr | 4205 | 622 | 3533 | 50 |
| | May | 3491 | 811 | 2630 | 50 |

| | | | | | |
|---|---|---|---|---|---|
| | Jun | 2105 | 533 | 1522 | 50 |
| | Jul | 3353 | 430 | 2873 | 50 |
| | Aug | 3007 | 413 | 2544 | 50 |
| | Sep | 870 | 428 | 392 | 50 |
| | Oct | 3300 | 663 | 2587 | 50 |
| | Nov | 2750 | 1260 | 1440 | 50 |

Source: MITT

### 3.4.5 Energy Resources and Consumption by Areas

The electricity required for the operation of MITT is received mainly from the national grid line of YESC and backup generators are installed in case of electricity cut off. YESC Thilawa Grid Line is 33kV Electricity and electricity is distributed to the MITT Main Substation (11kV and 0.4kV outgoing) through the MEPE Substation (33kV incoming). Then, the electricity is distributed to the Substation No.1 which is also called the Reefer Sub-station and the Substation No.2 as shown in Figure 3.4-15. The MITT electric power supply layout is shown in Figure 3.4-14. (The clear electric power supply layout is attached in Appendix-3.) The list of electricity consumption per month in MITT is described in Table 3.4-7.




Source: MITT

**Figure 3.4-14 MITT Electric Power Supply Layout**

Main Substation

MEPE Substation

Substation No.1

Substation No.2

Source: MITT

**Figure 3.4-15 Total Substations in MITT**

**Table 3.4-7 List of Electricity Consumption in MITT**

| Total Electricity Consumption in kWh | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
| 2018 | 219968 | 189027 | 258299 | 207311 | 256514 | 209453 | 218425 | 225065 | 262467 | 281603 | 303693 | 262159 |
| 2019 | 312034 | 243264 | 303258 | 322516 | 211106 | 174266 | 320754 | 213619 | 258096 | 223165 | 257559 | - |

Source: MITT

## 3.4.6 Waste Management

There are domestic wastes separated as wet waste and dry waste such as waste papers, food waste, plastic bottles, and other solid wastes that are generated from the office buildings, and canteens, etc., and the workshop wastes including hazardous wastes such as spilled/ leaked lubricants and waste batteries that are generated from backup generators and from repair and maintenance of factory machineries and vehicles in MITT. Waste segregation is implemented systematically and 3R (reduce, reuse, recycle) practices are promoted throughout the operation period. Wastes are stored separately at designated waste storage area and there are three separate storage rooms for segregated wastes in waste storage area as shown in Figure 3.4-16.

Waste lubricants and batteries are reused and stored separately with closed drums and containers at waste storage area with marking and labels. They are not allowed to discharge directly into the drainage in MITT. The Project Proponent will entrust Kyauktan Municipal for non-hazardous waste collection and disposal while there is a third-party organization that is in-charge contractor for hazardous waste collection. The types and amount of non-hazardous wastes can be checked at the waste storage area and around the project and recorded monthly throughout operation stage. The monthly record of total hazardous waste produced is shown in Table 3.4-8.

**Table 3.4-8 List of Hazardous Waste Produced**

| Year | Month | Lubricant (Tons) | Battery (Tons) | Total Hazardous Waste Produced (Tons) |
|---|---|---|---|---|
| 2018 | Jan | 1.087 | 0.173 | 1.26 |
| | Feb | 0.596 | 0.164 | 0.76 |
| | Mar | 0.524 | 0.146 | 0.67 |
| | Apr | 0.676 | 0.114 | 0.79 |
| | May | 0.991 | 0.199 | 1.19 |
| | Jun | 0.9695 | 0.2505 | 1.22 |
| | Jul | 1.169 | 0.131 | 1.3 |
| | Aug | 3.097 | 0.403 | 3.5 |
| | Sep | 3.412 | 0.088 | 3.5 |
| | Oct | 2.19 | 0.31 | 2.5 |
| | Nov | 1.817 | 0.183 | 2 |
| | Dec | 1.7 | 0.3 | 2 |
| 2019 | Jan | 2.25 | 0.06 | 2.31 |
| | Feb | 1.93 | 0.13 | 2.06 |
| | Mar | 1.74 | 0.20 | 1.93 |
| | Apr | 3.51 | 0.20 | 3.70 |
| | May | 2.86 | 0.40 | 3.26 |
| | Jun | 3.11 | 0.46 | 3.57 |
| | Jul | 1.37 | 0.40 | 1.77 |

Source: MITT

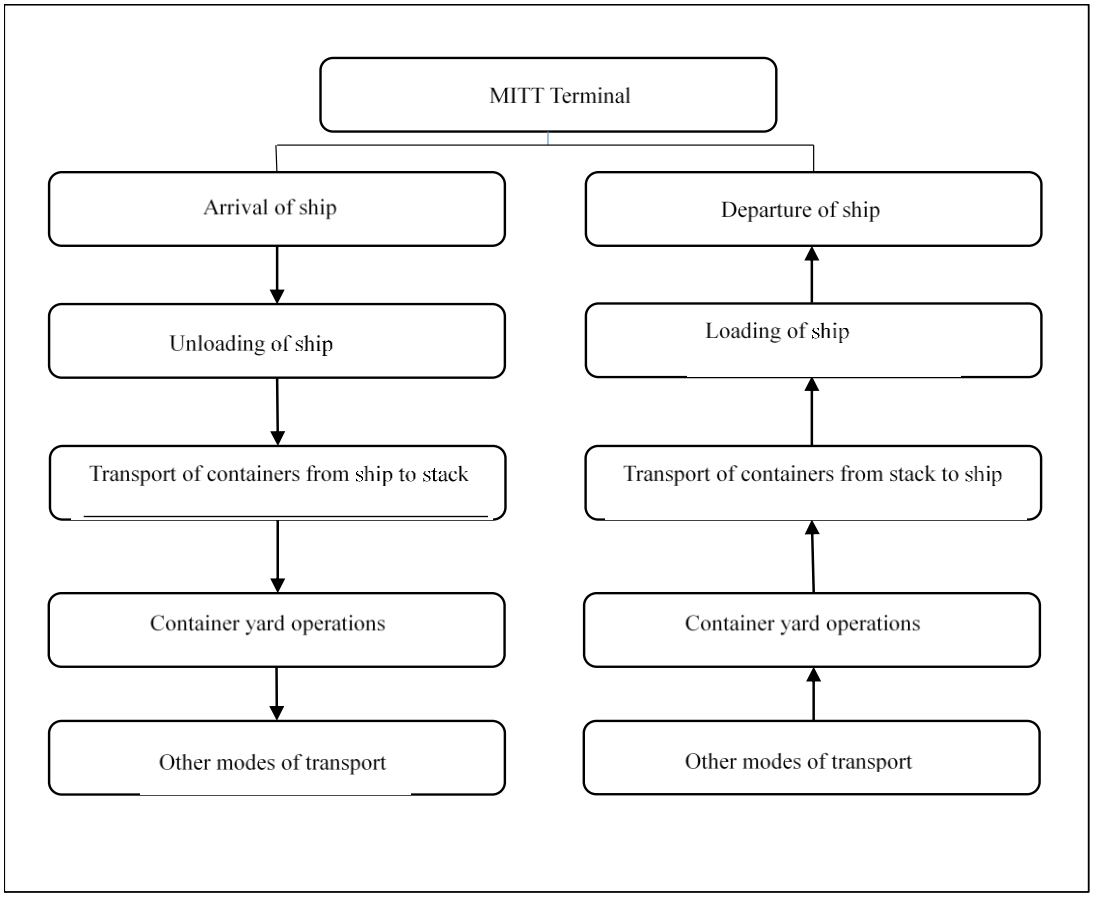
Source: MITT

**Figure 3.4-16 Waste Storage Area in MITT**

## 3.5 Port Operation Activities

### 3.5.1 Container Handling Process

The container handling process is one of the most important process of port operation activities and it consists of unloading/ loading of ship, transport of containers from ship to stack and vice versa, container yard operations, and inter terminal transport and other modes of transportation. The flow chart of the container handling process is provided in Figure 3.5-1.




Source: MITT

**Figure 3.5-1 Container Handling Process in MITT**

**(1) Unloading/ Loading of Ship**

When a ship arrives at the port, quay cranes (QCs) or ship-to-shore (STS) cranes take the import containers off the ship's hold or off the deck. QCs have trolleys that can move along the crane arm to transport the container from the ship to the transport vehicle and vice versa. A spreader, a specialized hooked device, holds to take/put containers off/on the deck and holds. It can be occurred that one QC is unloading containers while another QC is loading containers at the same time as shown in Figure 3.5-2.

In a hold the crane driver is almost free to determine the order in which the containers are unloaded. The unloading time of a container depends on its place in the ship. In contrast with the unloading process, there is hardly flexibility in the loading process. A good distribution of containers over the ship is necessary. At the operational level a stowage plan indicates for each container the exact place in the ship. Containers with the same destination, category, weight, size, contents and so on, belong to the same category. Sometimes,

only for each category the positions in the ship are given. Locations of containers belonging to the same category can be exchanged between containers of this category. In making the stowage planning attention should be paid to the order in which containers need to be unloaded. Unnecessary moves should be avoided by placing containers designated for a terminal visited later during the journey on top of containers designated for the earlier visited terminals.

Source: MITT

**Figure 3.5-2 Loading/Unloading of Ship in MITT**

**(2) Transport of Containers from Ship to Stack and vice versa**

The containers are transferred from the QCs to transportation vehicles that travel between the ship and the stacking area. This stacking area consists of a number of lanes, where containers can be stored for a certain period. Container handling equipment such as Rubber Tyred Gantry (RTG) cranes and Reach Stackers serve the lanes for container stacking. When a vehicle arrives at the stacking area, it puts the load down or the stack equipment takes the container off the vehicle and stores it in the stacking area as shown in Figure 3.5-3. For the transport of a container at a manned terminal, vehicles like forklift trucks, reach stackers, yard trucks or straddle carriers can be used. Straddle carriers, reach stackers and forklift trucks can pick up containers from the ground. A crane is needed to put the container on the yard truck. For the transport of multiple containers, multi-trailer systems can be used. In ports with low labor costs, the system of manned vehicles is preferable.

Source: MITT

**Figure 3.5-3 Transport of Containers from Ship to Stack and Vice Versa**

### (3) Container Yard Operations

Two ways of storing containers can be distinguished: storing on a chassis and stacking on the ground. With a chassis system, each container is individually accessible. With stacking on the ground containers can be piled up, which means that not every container is directly accessible. As a consequence of limited storage space, nowadays stacking on the ground is most common. The stack is the place where import and export containers can be stored for a certain period. The stack is divided into multiple blocks/lanes, each consisting of a number of rows. The height of stacking varies per terminal between two and eight containers high. At the end of each lane a transfer point might be situated. At this point the crane takes/places the container off/on the vehicle that transports the container. Empty containers are usually stored separately.

The process of storing and retrieving containers should be executed such that the remaining operations in the terminal can be carried out effectively. The efficiency of stacking depends among other things on the stack height and strategies for storage and retrieval planning of import and export containers. Consequences of higher stacking are a higher number of reshuffles/rehandles. To reach a specific container it can be necessary to rehandle containers that are placed on top of the demanded container. To minimize delay by removing containers, reshuffling of the stack can be done in advance. On the other hand, the higher the stacking the less ground space is needed for the same number of containers.

After a certain period, the containers are retrieved from the stack by cranes and transported by vehicles to transportation modes like barges, deep sea ships, trucks or trains. Before leaving from the port, the trucks have to be passed through the custom area where inspection is conducted by X-Ray machine and physical check at the platforms. The container yard operations in MITT are described in Figure 3.5-4.


Source: MITT

**Figure 3.5-4 Container Yard Operations in MITT**

In order to carry dangerous containers safely, certain principles must be adopted that prevent the vessels and its occupants from being put at risk. Dangerous items can be carried safely when appropriate measures have been taken and they are deemed safe. No matter how cargo is being transported, it must comply with The United Nations (UN) nine hazard classes for dangerous goods. The nine classes of dangerous goods

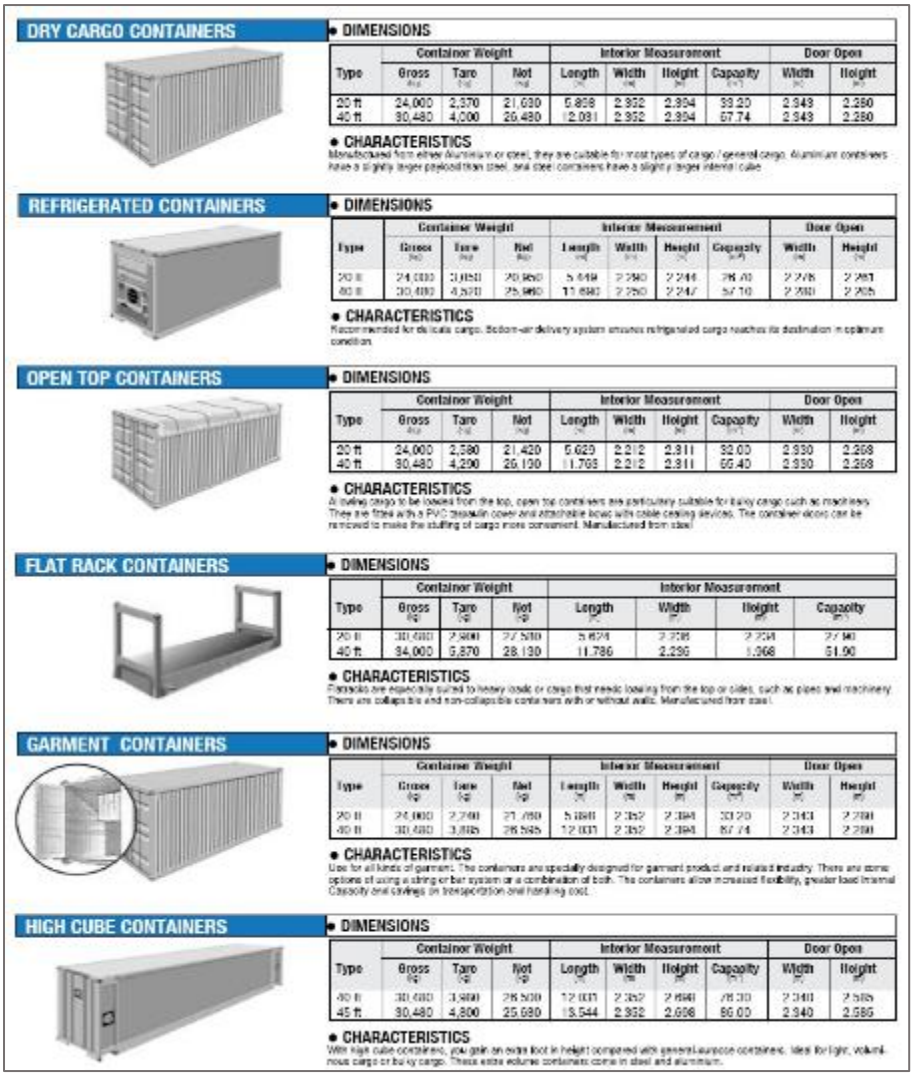
issued by IMO are shown in Table 3.5-1. Among them, MITT handles Class-1, 3, 4, 5, 6, 8, and 9 except Class-2 and Class-7. The sizes of the containers handled and types of the containers handled are shown in Figure 3.5-5.

**Table 3.5-1 Nine Classes of Dangerous Goods Issued by IMO**

| Sr. No. | IMO Class | Description | Sign |
|---|---|---|---|
| 1. | Class 1 Explosive materials | Class 1 items are not usually shipped by air and are divided into 6 subdivisions. They cover substances that have an explosion hazard, explosions that may project fragments and firebrands, and fire hazards. |  |
| 2. | Class 2 Gases | This class is divided into three subdivisions that include flammable gases, toxic gases and gases that are either flammable or toxic such as helium and oxygen. |   |
| 3. | Class 3 Flammable Liquids | Class 3 comprises liquids or mixtures of liquids that will give off flammable vapors at specific temperatures and have a flash point of not more than 60.5 degrees Celsius / 140.9 degrees Fahrenheit. |   |
| 4. | Class 4 Flammable Solids | Flammable solids are divided into 3 subdivisions that include highly flammable solids, solids that are likely to spontaneously and substances that, if they come into contact with water, emit flammable gases. |   |
| 5. | Class 5 Oxidizing Substances and Organic Pesticides | This class is divided into two subdivisions and covers agents that react with oxygen and organic pesticides. |   |
| 6. | Class 6 Toxic and Infectious Substances | Class 6 is divided into two subdivisions and includes substances such as cyanide, arsenic, vaccines and pathology specimens. |   |
| 7. | Class 7 Radioactive Materials | Class 7 covers materials that have a specific activity greater than 70 kilobecquerels per kilogram. |   |

| Sr. No. | IMO Class | Description | Sign |
|---|---|---|---|
| 8. | Class 8 Corrosive Materials | Class 8 does not have any subdivisions and comprises corrosive liquids and solids that will cause severe damage when in contact with living tissue; or, in the case of leakage, will materially damage or even destroy other goods or the aircraft itself. Corrosive items include battery acids, sulfuric acid and mercury. |   |
| 9. | Class 9 Miscellaneous | Class 9 is for miscellaneous dangerous items. The class does not have any subdivisions but comprises any substance that may pose a danger during air transport that isn't covered by the other classes. This includes items with anesthetic properties, solid dry ice, asbestos, life rafts and chain saws. |   |

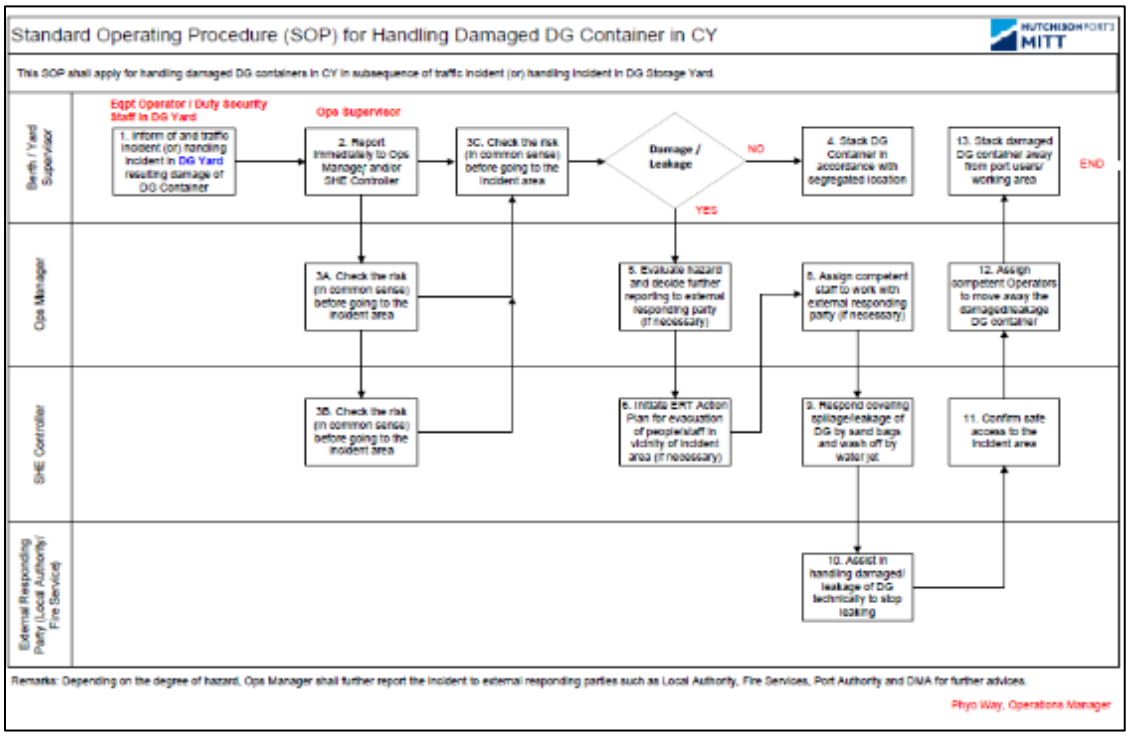
Source: International Maritime Organization (IMO)




Source: http://www.larklogistic.com/container.php

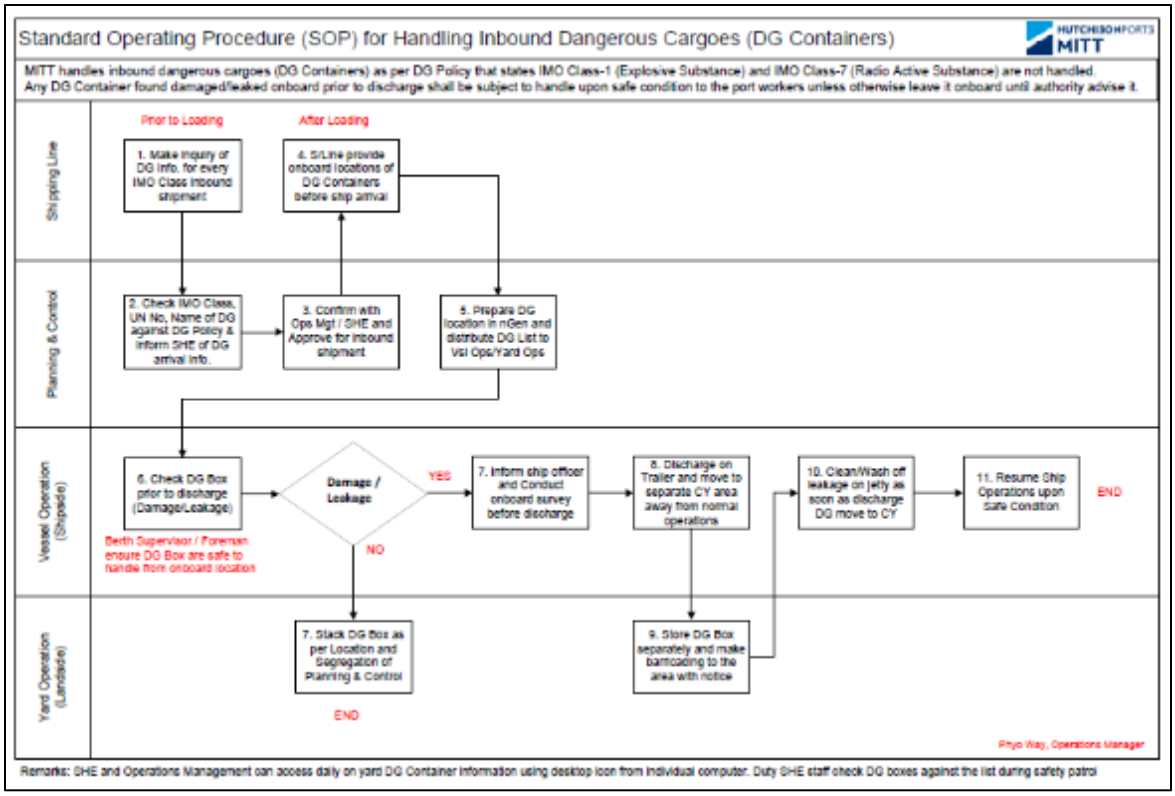
**Figure 3.5-5 Types and Sizes of Containers**

There are standard operating procedures for handling damaged, inbound, and outbound dangerous containers in MITT. The standard operating procedure for handling damaged dangerous containers is described in Figure 3.5-6. The standard operating procedure for handling inbound dangerous containers is shown in Figure 3.5-7. The standard operating procedure for handling outbound dangerous containers is described in Figure 3.5-8. (The clear standard operating procedures are attached in Appendix-3.) The summary of container throughput in MITT is shown in Table 3.5-2.



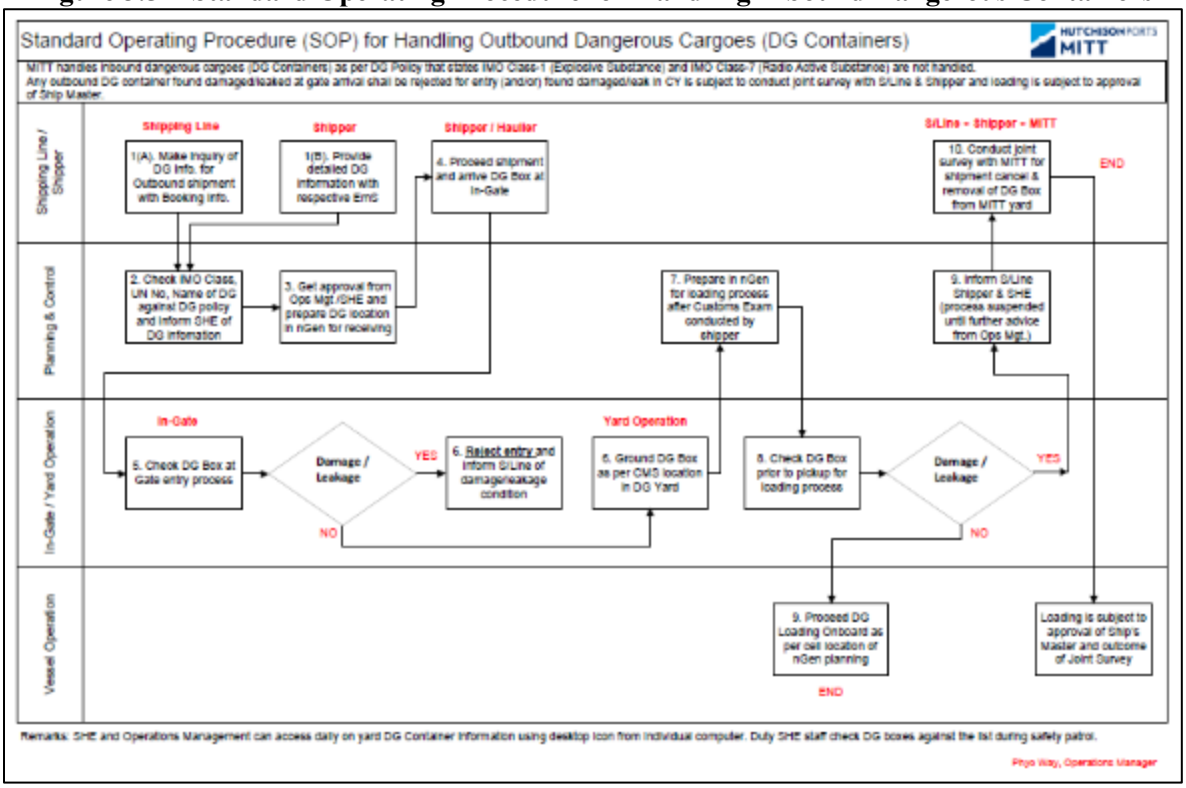

Source: MITT

**Figure 3.5-6 Standard Operating Procedure for Handling Damaged Dangerous Containers**




Source: MITT

**Figure 3.5-7 Standard Operating Procedure for Handling Inbound Dangerous Containers**




Source: MITT

**Figure 3.5-8 Standard Operating Procedure for Handling Outbound Dangerous Containers**

**Table 3.5-2 Summary of Container Throughput**

| Year | Inbound (TEU) | Outbound (TEU) | Total TEUs |
|---|---|---|---|
| 2016 | 49492 | 72978 | 122470 |
| 2017 | 70524 | 78378 | 148902 |
| 2018 | 98759 | 93044 | 191803 |
| 2019 | 107107 | 96507 | 203614 |

Source: MITT

Design vessel is a container ship of 35,000 DWT class and its specifications are shown in Table 3.5-3. Taking into account the actual records of calling vessels to MITT Port, the design ship is established as up to 2,000 TEU containers and max draft of 11.2m. The summary of number of vessel calls at MITT are described in

Table 3.5-4 and illustrative photos of berthing ships mentioned in above are shown in Figure 3.4-6.

**Table 3.5-3 Typical Dimensions of 35,000 DWT Container Ship**

| Dead Weight Tonnage (DWT) | Length overall (m) (Loa) | Length between perpendiculars (m) (Lpp) | Moulded breadth (m) (B) | Full load draft (m) (d) | Reference container carrying capacity (TEU) |
|---|---|---|---|---|---|
| 35,000 | 203 | 191 | 30.6 | 11.2 | 2,000 |

Source: Technical Standards and Commentaries for Port and Harbour Facilities in Japan 2007

**Table 3.5-4 Summary of Vessel Call**

| Year | Container Vessel | General Cargo Vessel | Car Carrier | Cruise Vessel | Goodwill Visit Foreign Ship | Sea-going Barge | Coastal Barge | In-land Shipping Barge | Total |
|---|---|---|---|---|---|---|---|---|---|
| 2018 | 355 | 113 | 24 | 12 | 11 | 0 | 6 | 345 | 866 |
| 2019 | 331 | 89 | 10 | 6 | 16 | 1 | 0 | 381 | 834 (Up to November) |

Source: MITT

### (4) Inter Terminal Transport and Other Modes of Transportation

As the final stage of the imported container handling process, these containers are delivered by either external trucks or in-land shipping barges or rails for delivery to the recipients. The modes of transportation for containers in MITT are shown in Figure 3.5-9.


Source: MITT

**Figure 3.5-9 Modes of Transportation for Containers in MITT**

### 3.5.2 Cargo Handling Process

The two main categories of cargoes are general cargoes and bulk cargoes. General cargo is unitized (carried in defined load units) while bulk cargo is loose (carried in any quantity). General cargo can be sub-divided into three categories:

**Break Bulk**. Concerns cargo that is carried in drums, bags, pallets or boxes. Such ships are typically geared.

**Neo Bulk**. Concerns cargo where each pre-packaged unit is accountable such as steel and vehicles (e.g. cars, heavy machineries and industrial equipment).

**Containerized**. The growth of container shipping required the creation of a new general cargo category where the cargo is being carried in container load units.

Bulk cargo can be divided in two categories:

**Liquid bulk**. The majority of the liquid bulk being carried is petroleum LNG (Liquefied Natural Gas) represents an emerging segment. Liquid bulk ships are commonly referred as tankers. But liquid bulk is not operated in MITT.

**Dry Bulk**. Concerns a wide variety of materials such as coal, iron ore, grains bauxite and sand.

The types of cargoes with example handled in MITT are described in Table 3.5-5 and import and exports cargoes at MITT are described in Table 3.5-6.

**Table 3.5-5 Types of Cargoes Handled at MITT**

| Type of cargo | Categories of cargo | Examples |
|---|---|---|
| General Cargoes | Break Bulk Cargoes | Copper plate<br>Fertilizers<br>Rice bags<br>Garment<br>Cement bags<br>Feed meals,<br>Machinery parts<br>Loose metals<br>Drummed cargoes<br>Boxes, etc. |
| | Neo Bulk Cargoes | Steel structures<br>Draw back machineries<br>Cars, Heavy machineries<br>Industrial equipment<br>Project cargoes, etc. |
| | Containerized Cargoes | Break bulk cargoes,<br>Refrigerated cargoes such as meats, fruits and dairy products, etc. |
| Bulk Cargoes | Dry bulk cargoes | Grain<br>Cement<br>Iron<br>Ore<br>Coal<br>Sugar<br>Wheat, etc. |

Source: MITT

**Table 3.5-6 Types of Import and Export Cargoes at MITT**

| Imports | Exports |
|---|---|
| Steel cargo | Rice in 50-kg bags |
| Feed meals and fertilizers in Jumbo bags | Draw back Machineries |
| Project cargoes | Steel Structures |
| Machineries and equipment | |
| Coal | |
| Vehicles | |

Source: MITT

### (1) General Cargo Handling

Containerized cargoes including break bulk cargoes and refrigerated cargoes are handled by quay cranes (QC) and RTG cranes for unloading from sea-going vessels onto the external trucks or in-land shipping barges and loading from trucks or barges onto the vessels. The quay crane is a type of large dockside gantry crane found at container terminals for loading and can traverse the length of a quay or yard on rails. When additional terminal capacity is required, the mobile harbour canes are used as a back-up for conventional dock cranes, to handle special loads. They are often used in place of conventional cranes as they are more flexible and require less investment in quayside infrastructure such as rails and power infrastructure. The Rubber Tyred Gantry Cranes are used for stacking, loading and unloading of shipping containers within the storage yards of the terminal. To meet the needs of different lifting situations, they are fitted with multiple hooking point's spreader. Reach Stackers, Front Loaders and forklift, etc. are used as transportation vehicles in cargo yard operations. They all are designed to be efficient with minimal noise and vibration. Empty

Handler is used to handle empty containers in empty container yard operation. The heavy equipment and special cargo such as bulldozers, cars and industrial equipment, etc. which are transported by bulk cargo ship/ Ro-Ro ship are hulled by terminal trailers. For transhipment of cargo and containers from port to cargo recipient, the transporters are used.

**(2) Bulk Cargo Handling**

There are cargo handling equipment like bagging units and grabs owned by the sub-contractors in MITT. A transportable bagging system providing operational fexibility. On-site movement and site-to-site transportation means that up to 120 tons of bulk delivered or stockpiled materials can be bagged each hour. Landing grab is clam shape consisting two complete buckets and is mainly designed for handling of power and fine bulk materials such as chemicals, fertilizer, grain, iron ore, sand, particle construction materials and smashed rocks, etc. It is widely used together with tower cranes, ship cranes, ship unloaders, travelling cranes and other types of cranes.

Remote control grab is a dual scoop grab that applies radio control technique to single rope grab. Compare with traditional single rope grab, it's more reliable, easy to operate, and typically operate in combination with single hook crane and ship deck crane.

The cargo handling process in MITT is shown in Figure 3.5-10.

Source: MITT

**Figure 3.5-10 Cargo Handling Process in MITT**

## 3.5.3 Additional Port Services

MITT mainly operates loading and unloading of cargoes and containers from berthing ships to container yards. But in order to meet customers' requirement and satisfaction, MITT provides other additional services such as linking with customers and logistic companies for delivery, arranging modes of transport for transshipment of cargoes and containers. Hutchison Logistic Myanmar service (HLM) has been servicing logistic and transportation from MITT to the customers and vice versa.

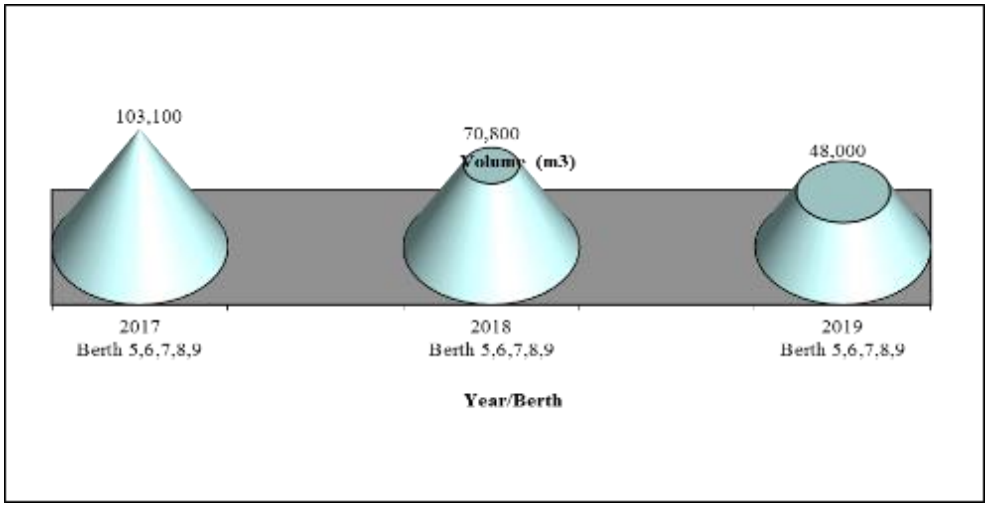
## 3.5.4 Maintenance Dredging Work

The purpose of the maintenance dredging work is to deepen or maintain navigable waterways or channels which are threatened to become silted with the passage of time, due to sediment sand and mud, possibly making them too shallow for navigation. Maintenance dredging work for MITT has been fully serviced by

MPA for overall dredging and disposal works including manpower and equipment etc. Grab dredger and hopper barge dredger types are typically used for dredging to maintain the 10m target depth along the jetty. The annual maintenance dredging amount is around 70,000 m3 and the frequency of this activity is normally two to three times (before and after rainy season) in a year. The illustrative photos of maintenance dredging work are shown in Figure 3.5-11. The comparison of the dredged volume per year is shown in Figure 3.5-12.

Source: MITT

**Figure 3.5-11 Maintenance Dredging Work at MITT**




Source: MITT

**Figure 3.5-12 Dredged Volume Comparison (2017 to 2019)**

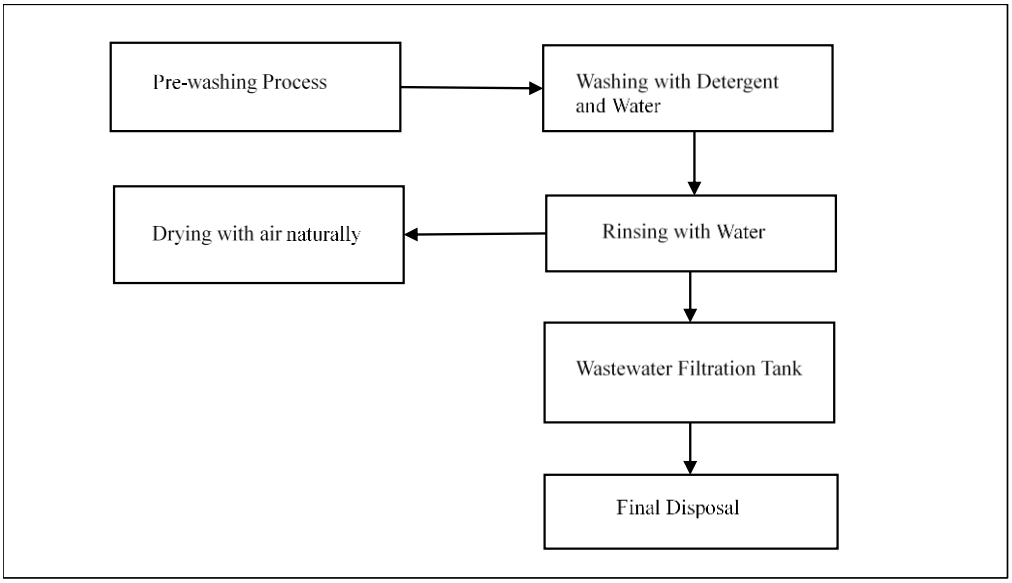
### 3.5.5 Container Washing Process

In MITT Port, container washing process has been servicing due to customers' request to reduce the risk of transmission of exotic pests and diseases via import or export pathways. The contaminants can attach to the surfaces of containers or locate in the many nooks and cervixes available on a container.

As current container washing area where wastewater treatment facility exists has a limited space, temporary container washing area is occupied at the remaining land area and washing processes are being serviced currently there. Container washing cycle includes the following steps: pre-washing of the internal and external part of the container, washing with detergent and water, rinsing with water, drying with the air naturally. The wastewater generated from container washing process is collected in the filtration tank before final disposal as shown in Figure 3.5-13. The temporary container washing area in MITT is described in Figure 3.5-14.

Measures that can be put in container washing process include:

- Ensuring ports of loading have effective means to clean shipping containers prior to loading.
- To minimize the risk of contamination, ensuring cleaned containers are stored in a clean area prior to loading.
- Ensuring cleaned containers are not re-contaminated in transit to the ship, prior to loading.
- Increasing container hygiene awareness with overseas clients and offshore container processing facilities.




Source: MITT

**Figure 3.5-13 Flow Chart of Container Washing Process (Temporary)**

Source: MITT

**Figure 3.5-14 Container Washing Area in MITT (Temporary)**

### 3.5.6 Modes of Transport

#### (1) Road Transportation

There are two access routes from MITT Port to the industrial parks around Yangon. Container trailers are not allowed to cross Yangon-Thanlyin Bridge (Thanlyin Bridge 1) located at the downstream of the Bago River, which has a rail track as well as motorway, due to the aging bridge's load restriction of 36 tons. Meanwhile, Dagon Bridge (Thanlyin Bridge 2) (at the upstream has a load restriction of 60 tons and container trailers are allowed to cross it. (See in Figure 3.5-15.)

Source: MITT

**Figure 3.5-15 Road Transportation at MITT**

#### (2) Rail Transportation

MITT have five berths capable of handling a wide variety of cargo. There is also a rail line right into the terminal linking MITT not only with Yangon city but also with the national rail network. Most of the shipments moved by rail are carried between domestic points, including shipments imported from other nations (See in Figure 3.5-16.) Railway services are hardly used for the bonded transport of export or import freight. The containers are carried from Yangon to Mandalay for parts and components as well as construction materials, but they are not very frequent.


Source: MITT

**Figure 3.5-16 Rail Transportation at MITT**

### (3) Inland Waterway Transportation

MITT facilitates container trucking service and inland shipping barges to ensure cost effective and efficient movement of cargoes. The Ministry of Transport and Communications has started the Inland Water Transport (IWT), a multi-purpose container barge service to transport goods along the Ayeyarwady River and containers in the Yangon River. The service was started to reduce transportation costs and relieve congestion on the road. The containers are transported by container barges and tugboats along the river between Myanmar International Terminals Thilawa (MITT) and Shwe Me port, Shwe Pyi Thar Township as shown in Figure 3.5-17. Riverine transport of containers greatly reduces traffic congestion on Yangon roads caused by the container cars and will reduce costs and transport time.

Source: MITT

**Figure 3.5-17 Inland Waterway Transportation**

## 3.5.7 Port Security Measures

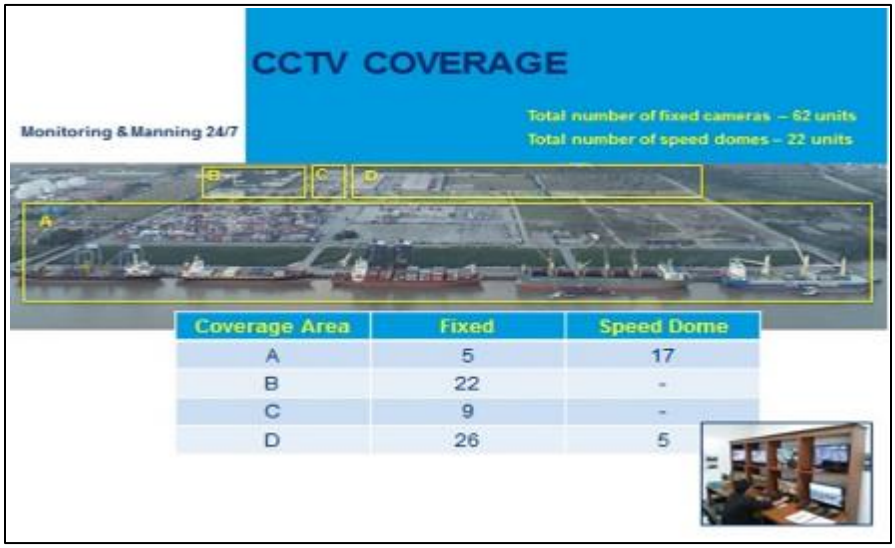
As port security measure for MITT, Access control for personnel, cars and cargos are conducted properly and monitoring by personnel and CCTVs are also conducted properly as shown in Figure 3.5-18. The gate pass for visitors and vehicles at MITT is shown in Figure 3.5-19.

**Table 3.5-7 Current Status of Port Security Measures at MITT**

| | |
|---|---|
| Access Control | MITT implements a bar code system as a control measures for port users' access in terms of issuing 4 different types of pass. These passes serve as a day-pass for 24 hours in exchange of port users' ID cards. In addition to the assess pass system, a portrait photo of individual port user is taken into system and saved for 7 days period. |
| Restricted Areas | MITT nominates 9 restricted areas on terminal premises namely main office building, CCTV control rooms, IT sever room, Documentation office, Power station, Fuel filling station Dangerous cargo area, LCL cargo area(CFS) and access onto equipment. Apart from the access onto equipment, all restricted areas are being looked after by way of fence, under lock and key, monitoring by CCTV and physical security staff assignment. |
| Cargo Handling | MITT handles both container and general cargoes in terms of incoming and outgoing via trucks through gate lanes, rail and quay-side vessels. All cargoes are subject to handle only after receiving of related documentation and physical checking at entry points as follows:<br>1. Gate staff physically check both outbound and inbound containers, including empty containers, at gate/rail entry points with respect documentation.<br>2. Quayside operation staff physically check both outbound and inbound containers, including empty containers, underneath the cranes during loading/discharging time against respective shipping document. |
| Delivery of Ship's store | Myanmar Port Authority (MPA) yearly tender for the selection of approved ship chandler together with security screening process. MITT allows only MPA approved ship chandler to provide provision to ship up on presentation of respective documentation from the customs department. Duty gate security staff physically check provisions against document, requested by the ship and approved by the authority concern, before entering into terminal. Duty security staff onboard also oversee the loading process of ship's provisions onboard. |

| | |
|---|---|
| Monitoring Port Facility | MITT assigns 24/7 security staff for monitoring port facility both physically on ground and from the CCTV room.<br>A total of 84 units CCTV (Fixed cameras 62 units and speed domes 22 units) are being fixed at below locations for monitoring the whole MITT premises 24/7 by duty security staff from the CCTV control room:<br>• Office buildings<br>• Main Gate area<br>• Office Gate area<br>• LCL Gate area<br>• Container Yard area<br>• CFS area<br>• X' rays area<br>• DG Yard area<br>• Jetty/ Quay Deck area |

Source: MITT




Source: MITT

**Figure 3.5-18 CCTV Coverage at MITT**


Source: MITT

**Figure 3.5-19 Gate Pass for Visitor and Vehicles at MITT**

## 3.5.8 Emergency Control Measures

### (1) Emergency Response Team Action Plan

In case of emergency situation to be responded by the emergency response team (ERT), all duty Security Staff are to be organized as per following action plan to muster the staff and port users on terminal according to designated Assembly Points for evacuation process. During ERT action plan, the priority is to be set out for the safe evacuation of human life and under no circumstances are properties considered as priority.

#### 1) Action Plan 1

During an emergency, all roadside access points are to be safeguarded by following strength of Security Staff and keep posting of manpower to better serve the evacuation process. Depending on the specific emergency situation, such access points are also to be considered as temporary closures (if necessary) to prevent unauthorized access of looters during an emergency. Should there be necessary to close the access points, the PFSO will decide to do so with the consultation of Management Team. Safeguarding of access points is described in

Table 3.5-8.

**Table 3.5-8 Safeguarding of Access Points**

| Year | Office Gate | | Main Gate | | CFS Gate | | Document Gate | |
|---|---|---|---|---|---|---|---|---|
| **Status** | Normal | ERT | Normal | ERT | Normal | ERT | Normal | ERT |
| **Security Staff** | 1 | 1 | 5 | 3 | 0 | 1 | 1 | Close |

Source: MITT

#### 2) Action Plan 2

PFSO/Security Supervisor is responsible for shuffling Security Staff strength to respective Assembly Points in order to help muster the public and make announcement of evacuation as needed. Shuffling Security staff is shown in Table 3.5-9.

**Table 3.5-9 Shuffling Security Staff**

| From | | To | |
|---|---|---|---|
| **Location** | **No. of Security** | **Location** | **No. of Security** |
| Document Gate | 1 | Assembly Point No.1 | 1 |
| Trestle-1 | 1 | | 1 |
| Main Cargo Gate | 5 | Assembly Point No.2 | 2 |
| Toyofuji-1 | 3 | | 1 |
| ECL-1 | 4 | | 2 |
| Onboard Ships | 10 | Assembly Point No.3 | 5 |
| RTG | 1 | | 1 |
| ECY | 1 | Assembly Point No.4 | 1 |
| RA2 | 1 | | 1 |
| Toyofuji-2 | 1 | | 1 |
| QC | 1 | | 1 |

Source: MITT

During an emergency, the security staff are to be shuffled and made available at the assembly points. Announcing public and mustering at assembly points is described in Table 3.5-10.

**Table 3.5-10 Announcing Public and Mustering at Assembly Points**

| Location | Announcing Public | | | Mustering for | Commander |
|---|---|---|---|---|---|
| | Location/ Staff | Normal | ERT | | |
| Assembly Point No.1 | Trestle-1 | 0 | 1 | Office Staff/ M&R Staff<br>Canteen Staff<br>Port Users/ Visitors | PFSO/<br>Security Supervisor |
| | Document Gate | 1 | 1 | | |
| | Assistant Supervisor | In Office | 1 | | |
| | Supervisor | In Office | 1 | | |
| | PFSO | In Office | 1 | | |
| | Total Available Strength | | 5 | | |
| Assembly Point No.2 | CFS Security | 5 | 1 | CFS Staff/ CFS Canteen<br>Customs Officers<br>Port Users/ Visitors | Senior Security Guard<br>(Gate) |
| | From Main Gate<br>(Shuffled security) | 3 | 2 | | |
| | From Toyofuji-1<br>(Shuffled security) | 4 | 1 | | |
| | From ECL-1<br>(Shuffled security) | 0 | 2 | | |
| | Total Available Strength | | 5 | | |
| Assembly Point No.3 | Onboard Ships | 10 | 5 | Berth Staff/ Stevedore<br>Shipping Lines Staff<br>Port Users/ Truckers | Senior Security Guard<br>(RTG) |
| | From RTG<br>(Shuffled security) | 0 | 1 | | |
| | Total Available Strength | | 6 | | |
| Assembly Point No.4 | Trestle-4 | 1 | 1 | Operators/ Checkers<br>Shipping Lines Staff<br>Port Users/ Truckers | Senior Security Guard<br>(ECY) |
| | From ECY<br>(Shuffled security) | 1 | 1 | | |
| | From Toyofuji-2<br>(Shuffled security) | 1 | 1 | | |
| | From RA-2<br>(Shuffled security) | 1 | 1 | | |
| | From QC<br>(Shuffled security) | 0 | 1 | | |
| | Total Available Strength | | 5 | | |

Source: MITT

### 3) Action Plan 3

**Communication**

An emergency situation incurring on the terminal is to be informed to External Security Authorities such as Thanlyin and Kyauktan Administration Offices, Police stations and Fire brigades. In addition, any emergency situation must be reported right away to the Myanmar Port Authority (MPA) and Department of Marine Administration (DMA). Under the supervision of PFSO/Security Supervisor, duty CCTV Security Staff in the CCTV Main Control Room is to make phone calls to the above external authorities while ERT Members are in preparation of mustering. Detailed contact numbers are available in the PFSO Room and CCTV Room.

**Cooperation with External Security Authorities**

Security staff assigned at the rest of individual locations are to work out closely with external authorities as soon as they are on terminal to help handle emergency.

**Evacuation**

Under the supervision of PFSO/Security Supervisor, all ERT Members respectively assigned as area-wise commanders are to work out closely each other and to announce public to muster at the designated Assembly Points. PFOS/Security Supervisor is to check for available MITT Drivers with Admin and Operations Departments through sectional supervisors. With regard to the degree of urgency and depending on the situation of emergency, it is to prevail up on a common sense approach to consider effective evacuation routes and process to be carried out while performing evacuation. (i.e. Trestle 2 road to Main Gate, Trestle 1 road to Office Gate) ERT Members are to carry out step by step evacuation as per emergency situation incurring over the terminal areas which Assembly Point nearest to the emergency situation is considered as a priority evacuation point. Safety of human life is paramount during an emergency and ERT Members are to advise public not to bring along bulky properties/unnecessary items during evacuation process. Area-wise commanders of security staff are to conduct headcount for ensuring no one is left during evacuation.

**Equipment/ Resources utilized**

The equipment and resources utilized in emergency response team action plan are siren (to alert staff and public on terminal about emergency situation), Channel 16 radios (to communicate with MPA Port Tower, DMA and ships berthing alongside), Walkie-Talkie radios (to communicate among the MITT security staff/supervision), fire extinguishers , fore hoses and pipes (for firefighting in case of fire emergency), terminal Suzuki light truck 2 units (for movement of emergency resources/evacuation), MITT Office ferry buses x 4 units (for evacuation), MITT Office cars (minimum 4 units to maximum all available cars during emergency), low-bed trailer x 3 units (for massive movement of resources/crowd movement), and megaphones (for public announcement).

### (2) Storm Protection Plan

The purpose of the storm protection plan is to reduce the damages and personal injuries in MITT. It is necessary to be considered for storm protection, evacuation, and resettlement in three stages which are “Before storm”, “During storm”, and “After storm”.

#### 1) Before Storm

**Getting Storm warning**

Information and warning from authorities will come to Administration Department. Administration Department collected the information from Ministry of Transport, MPA and Department of Meteorology & Hydrology and internet weather reports. According to The Myanmar Port Authority’s storm protection plan, various strong wind (Storm) stages will be indicated by color: yellow stage – storm starts form the Bay of Bengal and Adman Sea, orange Stage – storm moving toward the Myanmar coastal, red stage – storm approaching to the coastal, brown stage – storm hitting, and green stage – after storm.

**Confirmation of warning and taking action**

When it was confirmed on dangerous storm approaching to Yangon that supposed to be hit MITT, AGM will order to take necessary action in right timing. The announcement regarding to the storm shall be issued to staffs from Administration Department.

**Evacuation**

All persons except the staff who assigned and responsible person, should leave MITT after announcement of storm. The transportation of staff will be arranged by Administration Department as possible.

**Protection**

The equipment such as RTG, HMC, reach stackers, vehicles, forklifts, office cars, trailers, and Rosa buses

are protected from storm in MITT. The RTG is parked at parking places of FCY and fasten at tie down hooks. The HMC is parked at the middle of the Jetty (parking place that was specified), Jack up, Boom down and fasten as required. The Reach Stackers are placed at flat yard such as between CFS keeping away from Container Boxes and falling objects. The Vehicles, Forklifts, office cars are kept inside CFS and Workshop. The Trailers are placed on the main road approaching Trestle No-2. The Rosa Buses are parked in Parking of MITT Buildings.

**Buildings**

The building door glass will be covered by Plywood and fastened the Plywood with timber to cover at the Main Large Entrance 4 Nos and Entrance 4 Nos. Some important rooms like the window Glasses of CCTV room, IT room, GM, AGM, FM rooms will be covered with Plywood and timber. Each departments and individuals are taking care of their important documents and computers, safes and others to protect storm. The safes are recommended to put on the wooden stacks permanently for example put the computers and electrical appliances are put on the table or high place and secure place. The important documents are covered with plastic sheets, etc. Although the CFSs withstand for wind speed 120 KM/ hr, we cannot have means to do special protection above that wind speed. But the CFS Rollers doors will be fastened and blocked with laden Containers as far as possible. Most of the MITT radio receivers (Satellite Receivers, Internet Receivers, etc.) except one which will be left for information receipt are dismantle and keep in secure placed. Collection fresh water from Thilawa Reservoir and reserve at Tank as possible.

**Operation**

The Container boxes especially empty containers are lower down from the high stacking and fasten securely. Management will give instruction when the operation will cease because the preparation for storm protection will take some time. The Vessel berthed at MITT should sail out from MITT before Storm by order of Myanmar Port Authority.

**Security Arrangement**

The minimum strength of responsible persons and staff are assigned to take care of MITT during Storm. At least it will be required to assign a security team, an engineering staff, and an operation staff. Management will assign Duty Officers (one or two persons) to take responsibility during Storm and specify his duties to arrange for communication system during storm. Administration and IT Department will arrange for

WCDMA or Radio Wireless or suitable phones, to arrange for foods, water, torch lights and necessities for the persons who assigned to stay at MITT.

**2) During Storm**

During the storm passing through MITT, it is necessary to protect the personal safety and damages of the properties as possible.

**Duty and responsibility of Duty Officers**

Duty Officer will be in-charge to take care of safety and security of MITT and assigned staff. The safety of assigned Staff should be priority. MITT Management will give detail instruction of his duties during storm. Duty Officers will be leaders of the team who assigned to stay at MITT according to the above security arrangement. Continuous contacts and communicate with Management with appropriate ways. Act as coordinator to communicate between Authorities and Vessels. Main Duty is to do Safety of the persons assigned in MITT and Security of MITT properties with full strength, to help the customers and other persons at MITT to stay at a safe place, to shut down the Computer servers, CCTV System and electric power supplies when they are necessary to in conjunction together with the responsible persons and to get necessary assistance from other parties (if required) like Thanlyin Naval Command office and Marine Police Force etc.

**The Electric Power**

The engineering staff assigned, has to discuss with Duty Officers and decide when electric power will shut down. It is necessary to consider the consequent of the effects of electric power shut down like the sewage treatment plants and MITT office building securities, etc.

**3) After Storm**

As soon as the storm calm down the important tasks need to be carried out so that we can rescue properties and persons from damages and injuries. They are inspection of all buildings, civil structure and equipment if there have damages due to storm, inspection and fixing for electric power and water supplies, reporting the damage condition to Head Office, Authorities and Insurance (if necessary), and remedy the damages.

**(3) Flood Preparedness Plan**

This guide allows to prepare for a flood and keeps MITT staff and important documents to be safe when the waters rise. It is important to note that natural disasters can strike with a little warning time. Floods are not the common disaster in MITT since the original design level of MITT is safely higher than chart datum in terms of 7.5m high on quay deck and 8m high on landside CY storage yard and warehouses.

**1) Watch for Flood Emergency Alerts**

It is to be aware and ensure that every staff doesn't miss a flash flood warning. Upon a flood news and warning issued by the authority concerned, MITT Safety Committee (and/or) SHE Officer shall communicate such information to all staff by email or hard copy prints. A flood watch means that a flood is possible, while a flood warning means the natural disaster is already occurring or is imminent.

**2) Purchase an Emergency Weather Radio and Torch Lights**

Flooding natural disaster may disrupt normal communication channels and knock out the power. In this circumstance, it is helpful to have an emergency weather radio (portable size with AA batteries) on hand. Such emergency weather radios can be active up-to-date flood news in case of loss of communication through normal communication channels. Handy torch lights are also be taken into account for ready-to-use condition as and when necessary. MITT Safety Committee/SHE Officer shall be responsible to ensure the availability of above requirements of emergence weather radio and torch lights as soon as flood warning issued by the government for Thilawa Port.

**3) Secure Important Documents in Your Emergency Bag**

It is necessary to make available Emergency Bags in every department. It is recommended that individual department shall organize their vital/important papers keeping in a fireproof lockbox or any means of safe box that can survive severe weather or travel with the staff. If any staff do not have time to gather all of the documents in one spot, at least take inventory so the Department Heads know where the most important files are. The vital documents of the company are shown below, but not limited to MITT Company Registration, BOT Contracts and other administrative papers of Admin Department, MITT Financial and Insurance Policy Papers of Finance Department, MITT Customer Contracts/Agreement of Commercial Department, documents contained high level information for BU Head of GM Office, and Company Tax records and Cash in hand of Finance Department. It is recommended to proactively digitize important documents and upload them to a cloud-based storage system (or) keeping them at a secured off-site location where there is an integrity for information security.

**4) Vital Supplies for Emergency Flood Kits**

It is recommended having to-go kits filled with medicines, asthma inhalers, nonperishable/dried food such as biscuits and cookies, a multipurpose knife, a flashlight with extra batteries, bottled water, first-aid kit and a whistle or noisemaker. Upon receiving flood warning, MITT Safety Committee shall advise MITT Canteen to pack dried food and bottled water into individual plastic bags.

**5) Use Landscaping to Improve Drainage**

Protect drainage against flooding wherever possible by implementing design techniques that promote effective drainage. MITT engineering department shall ensure that the drainage systems are maintained properly causing slope away from MITT Landside to river-side in all directions. It is also recommended to have submersible pumps under engineering department's control in order to quickly remove waters where it is necessary to maintain some important areas less flooded such as Data Server Room, New Car Yard, Reefer Station Area, DG Storage area, etc.

**6) Prepare an Emergency Plan for Desktop Computers**

It is recommended to have an emergency plan to raise up "system units of desktop computers" in case of any flooding condition.

**7) Consider a Flood Insurance Policy**

It is good to purchase a flood insurance policy despite there is lass possibility at MITT. This will ensure MITT to have less burden in case of any flood hits MITT, Thilawa Port.

**8) Create an Evacuation Route (Think ahead of Flood)**

It is recommended that MITT Safety Committee shall consider an effective evacuation route for the staff once flood warning/news issued by the authority. If there is possible flooding situation, all staff shall leave the terminal before flood comes. Only key responding staff should be stationed on terminal if the flood is not life-threatening situation.

**9) Setup a Communication Network with Local Authorities**

During flood disasters, it is recommended to have a communication network with local authorities for better assistance in creation of evacuation routes and saving lives of MITT staff. MITT Safety Committee shall ensure emergency contacts in case of flooding situation and setting up a communication network using mobile phone's application such as "Messenger" so that the real flood information can be communicated each other during the flood in order to get assistance for Medicine and transportation devices in case of emergency. Channel 16 Walkie-talkie can be also used to communicate with Port Authority during emergency. With these flood preparation steps, MITT will be able to assure that its staff shall be in safety during (and/or) before the flood comes.

## 3.6 Project Schedule and Manpower Requirement

### 3.6.1 Project Schedule

All equipment operators are trained by the in-house –training programs and issued "License" individually based on individual license class against trained equipment. The working schedules for general cargo operation and container operation are shown in Table 3.6-1.

**Table 3.6-1. Operation Schedule**

| Operation | Shift | Hours |
|---|---|---|
| General Cargo Operation | 2 x 12 hour | (08:00-20:00) (20:00-08:00) |
| Container Operation | 3 x 8 hour | (06:00-14:00) (14:00-22:00) (22:00-06:00) |

Source: MITT

### 3.6.2 Manpower Requirement

In the MITT Port, the key operational activities are ship operations, yard operations, quay transfer operations, receiving/delivery operations and Container Freight Station Operations. In addition to this, safety, security and environmental activities are associated activities. The number of workers at each activity are shown in Table 3.6-2.

**Table 3.6-2. Number of Workers at Each Activity**

| Staff Headcount | Permanent | Casual Staff and Stevedore |
|---|---|---|
| Planning and administration | 18 | 0 |
| Ship operations | 6 | 70 (Container), 250 (General Cargo) |
| Quay transfer operations | 0 | 50 |
| Yard operations | 66 | 15 |
| Receiving/Delivery (Gate and document counter) | 14 | 7 |
| Container Freight Station Operations | 5 | 30 |
| Safety, security, and environmental activities | 15 | 73 |
| Total | 124 | 495 |

Source: MITT

## 3.7 Future Prospects

The container handling capacity of the MITT Port in current condition is 450,000 TEU and it is expected to increase over 1 million TEU in the future.