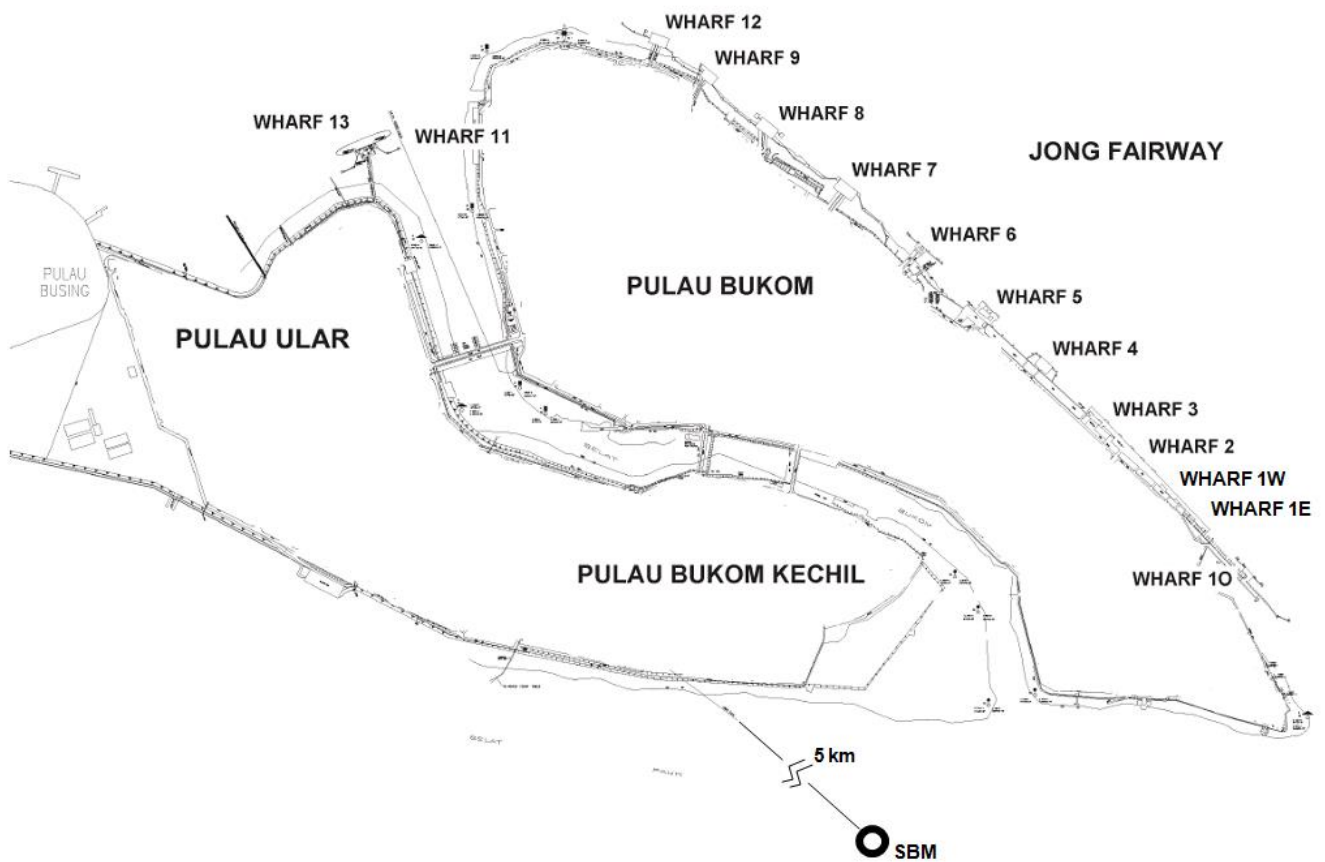




Pulau Bukom Marine Terminal Information Booklet



SHELL EASTERN PETROLEUM (PTE) LTD.

PULAU BUKOM

1. FOREWORD

These regulations have been compiled for your information and guidance and contain the essential requirements for safe operation at Pulau Bukom. The following directives are not intended as a substitute for the OCIMF Publication INTERNATIONAL SAFETY GUIDE FOR OIL TANKERS AND TERMINALS (ISGOTT) which should be complied with in full at all times.

This booklet is for your continued use and ready reference during your present stay and future visits to Pulau Bukom.

We look forward to receiving your full co-operation during your port stay in Bukom and you are requested to pay particular attention to matters concerning your safety.

PRODUCTION MANAGER

DOCUMENT HISTORY AND CONTROL

<u>Date</u>	<u>Rev.</u>	<u>Reason for Change</u>	<u>Author</u>
08/2010	1.0	Separated Terminal Safety & Operational Guide from the printed booklet and now being sent as part of Pre-Berthing Questionnaire	Capt. Tay Juet Hui
05/2012	2.0	Complete review of Safety & Operational Guide to align it with Global Template for Terminal Information Booklet	Capt. B. Jayakumar
04/2013	3.0	Terminal information section and Part J updated	Capt. B. Jayakumar
03/2015	4.0	Review of Safety & Operational Guide, changed repetitive ship-shore checks frequency to 3 hours & inclusion of instructions for concurrent bunkering	Capt. Amit Gupta
04/2016	5.0	Latest maximum draft information updated	Capt. Raghu Iyer
05/2016	6.0	Reviewed section on H2S Precautions to align with site work instructions	Capt. Raghu Iyer
06/2020	7.0	Amended the table for Draft and Freeboard	Capt. Amarendra
08/2020	8.0	Review and update as per OCIMF Guidelines & Recommendation for Marine Terminal Information Booklet and ISGOTT 6 th Edition	Capt. Vasu
04/2021	8.1	Updated section 11.26 & Appendix 4	Capt. Prasad Raghavan
11/2021	9.0	Updated Life Saving Rules Define abort points and approach speed Updated manifold height for WH 12 MLA	Capt. Vasu
11/2022	9.1	Updated contact number of DMO and SBM DMO	Capt. Vasu
12/2023	9.2	Sec 9 page 23, max freeboard limit for WH12	Capt. Prasad Raghavan

Superseded issues of this document should be destroyed

Terminal Name: SHELL PULAU BUKOM MARINE TERMINAL

2. KEY CONTACTS

In Case of Emergency (ICE)

- VHF CH 19 (Call sign: Movement Control)
- Lead Shore Loading Officer (SLO Lead): +65 6263 4422 / 4424
- Shore Loading Officer (SLO): +65 6263 4435 / 4436
- Duty Marine Officer (DMO): +65 8163 4027
- SBM Duty Marine Officer: +65 8163 4762
- Fire / Security Incidents: +65 6263 4101
- Bukom Police Station: +65 6263 5516

Tell the operator the following when reporting Emergency:

- I. What has happened;
- II. Where the emergency is;
- III. Are there casualties;
- IV. Vessel's name.

Terminal Address and phone numbers:

Pulau Bukom Manufacturing Site
Pulau Bukom
P.O. Box 1908
Singapore 903808

VHF Channel: 19 (24 hours)
Tel: +65 6263 4424 / 4422 (24 hours)
Email: MCR-Cntl-Rm-Supvs@shell.com

Port Authority:

Maritime Port Authority of Singapore (MPA)
460 Alexandra Road
PSA Building #19-00
Singapore 119963

Marine Environment and Safety:
Tel: +65 6325 2488 / +65 6325 2489
Email: pms@mpa.gov.sg

Port Security:
Tel: +65 6221 3127
Email: isps@mpa.gov.sg

Pilots:

PSA Marine (Pte) Ltd
70 West Coast Ferry Road
Singapore 126800
Tel: +65 6777 2288
Fax: +65 6379 9800
Email: psamarine@globalpsa.com

NOTE: Every ship alongside is provided with a Shore Walkie-Talkie tuned to a dedicated private frequency used for ship/shore communication during cargo operations and linked to our Movements Control Room Centre.

3. PULAU BUKOM MARINE DEPARTMENT

Dear Sir,

BUKOM MARITIME DEPARTMENT

Bukom MARINE DEPARTMENT provides operational advice on marine-related matters both to ship masters as well as personnel involved in tanker and terminal operation.

All routine communications should be done during office hours (Mon-Fri 0800-1700). Preferred mode of communication is E-Mail to SEPLOP-Marine-Clearance@Shell.com

In the event of EMERGENCY, the Duty Marine Officer (DMO) can be reached 24/7 at Mobile No. +65 8163 4027.

MARINE MANAGER
PULAU BUKOM

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5. ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
COW	Crude Oil Washing
C2	Ethylene
DMO	Duty Marine Officer
HFA	Hydrofluoric Alkylation Unit
H2S	Hydrogen Sulphide
HSSE	Health, Safety, Security & Environment
ICE	In Case of Emergency
IGS	Inert Gas System
ISGOTT	International Safety Guide for Oil Tanker and Terminal
ISPS	International Ship and Port Facility Security
IOGP	International Association of Oil & Gas Producers
LOA	Length Overall
LPG	Liquefied Petroleum Gas
LSR	Life Saving Rules
MCR	Movement Control Room
MLA	Marine Loading Arm
MPA	Maritime Port Authority of Singapore
OCIMF	Oil Companies International Marine Forum
PBQ	Pre-Berthing Questionnaire
PFD	Personal Floatation Device
PPE	Personal Protective Equipment
SBM	Single Buoy Mooring
SDS	Safety Data Sheet
SIRE	Ship Inspection Report
SLO	Shore Loading Officer
SLO Lead	Shore Loading Officer Lead
UKC	Under Keel Clearance
VHF	Very High Frequency

6. EMERGENCY PROCEDURES

TERMINAL ALARM SIGNAL

1. Site wide emergency: Siren in high & low alternating pitches
2. All clear: A continuous siren at a fixed pitch for 1 minute

NOTE: Testing of Site Wide Alarm every Wednesday at 1330 hours local time.
Ship's staff should remain onboard until "ALL CLEAR" has sounded

SHIP OPERATIONS

When the fire alarm is sounded, ships should stand by for possible stoppage of operations. SHIP'S STAFF MUST NOT INITIATE ANY ACTION OF THEIR OWN concerning shutting down of valves (etc.) UNLESS the fire is on board their ship or directly endangering the vessel. Ships must await instructions from shore before taking action regarding cargo or bunkering operations.

Master will be advised by Terminal personnel regarding the movement of their ships. NO ATTEMPT MUST BE MADE TO UNMOOR AND LEAVE THE WHARF without instructions from the terminal.

COMMUNICATIONS

VHF Radio. On hearing the fire alarm, a member of the vessel's staff should man the ship's radio, switch on to Channel 19, and standby for information. If you have anything important pertaining to safety, call BUKOM OPERATIONS +65 6263 4424 / +65 6253 4422

"DO NOT HESITATE TO RAISE THE ALARM"

SHIPS FIRE ALARM WHEN ALONGSIDE TERMINAL BERTH

Seven or more blasts followed by 1 long blast on the ship's whistle supplemented by sounding of the general alarm system onboard vessel. IN CASE OF FIRE, TERMINAL WILL DIRECT MOVEMENT OF TRAFFIC

FIRE ON BOARD SHIP

Raise alarm
Fight fire and prevent fire spreading
Inform terminal
Cease all cargo operation and then close all valves
Stand by to disconnect hoses or arms
Bring engines to standby

FIRE ON OTHER SHIPS OR TERMINAL

You will be advised and if necessary be instructed to:
Cease all cargo operation and then close all valves
Stand by to disconnect hoses or arms
Bring engines to standby and crew to standby ready to unberth

TOXIC VAPOUR RELEASE

Raise alarm
Inform MOVEMENT CONTROL
Cease all cargo operation and then close all valves
Lower Inert gas pressure in the cargo tanks
Consider continuation of discharge operations to allow inert gas pressure to lower to acceptable level in order that PV valve sits back in position
Crew to take protective positions on deck and stay upwind
Crew to ensure that accommodation vents are full shut

COLLISION / DAMAGE TO BERTH

Raise alarm
Inform MOVEMENT CONTROL
Cargo and other compartments to be sounded
Monitor product release or water ingress
Tidal calculation to be performed
Shipboard spill response to be activated to control spillage if any
Take instruction from Movement Control & Pilot

FIRE ON TERMINAL

Raise alarm
Cease all cargo operation and then close all valves
Fight fire and prevent fire spreading
If required standby to disconnect hoses or arms
Inform all ships
Terminal Emergency Procedure is immediately effected

OIL SPILL ONBOARD SHIP

Raise alarm
Shipboard spill response to be activated to control spillage if any
Inform MOVEMENT CONTROL
Cease all cargo operation and then close all valves
Stand by to disconnect hoses or arms
Bring engines to standby

PERSON OVERBOARD

Raise alarm
Inform MOVEMENT CONTROL
Cease all cargo operation and then close all valves
Shipboard emergency response to be activated

MEDICAL EMERGENCY / EVACUATION INSTRUCTIONS IN CASE SHIP STAFF REQUIRING IMMEDIATE MEDICAL ATTENTION

Inform MOVEMENT CONTROL and ship's agent
Terminal has a duty medic available 24/7; to provide support

SECURITY BREACH

Raise alarm
Inform MOVEMENT CONTROL
Inform BUKOM POLICE
Cease all cargo operation and then close all valves
Shipboard Security Plan to be activated

7. HEALTH, SAFETY AND SECURITY POLICIES

7.01 SHELL'S HSSE COMMITMENT & POLICY

SHELL'S COMMITMENT

Shell has a commitment and Policy on Health, Security, Safety, the Environment and Social Performance. In Shell we are all committed to:

- Pursue the goal of no harm to people
- Protect the environment
- Use material and energy efficiently to provide our products and services
- Respect our neighbours and contribute to the societies in which we operate
- Develop energy resources, products and services consistent with these aims
- Publicly report on our performance
- Play a leading role in promoting best practice in our industries
- Manage HSSE & SP matters as any other critical business activity; and
- Promote a culture in which all Shell employees share this commitment

In this way we aim to have a Health, Security, Safety, the Environment and Social Performance we can be proud of, to earn the confidence of customers, shareholders and society at large, to be a good neighbour and to contribute to sustainable development.

SHELL'S POLICY

Every Shell Company

- Has a systematic approach to HSSE & SP management designed to ensure compliance with the law and to achieve continuous performance improvement
- Sets targets for improvement and measures, appraises and reports performance
- Requires contractors to manage HSSE & SP in line with this policy
- Requires joint ventures under its operational control to apply this policy, and uses its influence to promote it in its other ventures
- Engages effectively with neighbours and impacted communities; and
- Includes HSSE & SP performance in the appraisal of staff and rewards accordingly

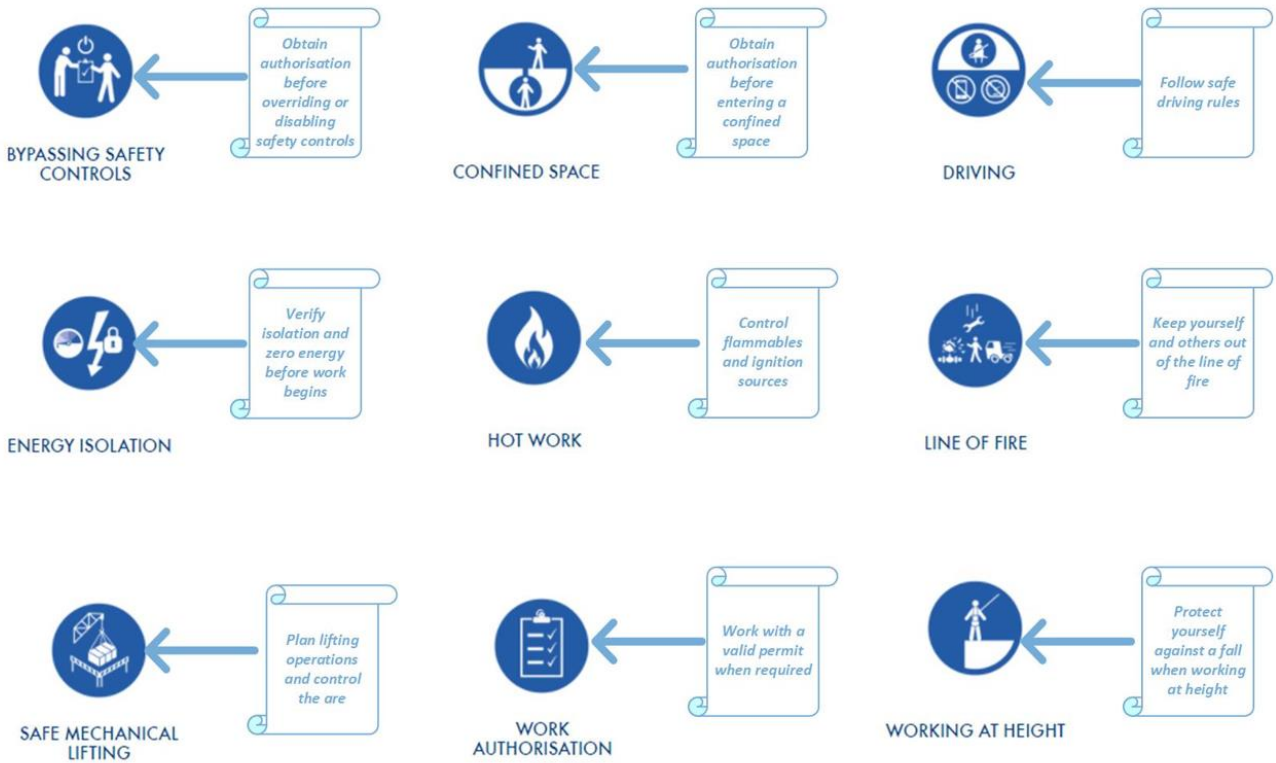
LIFE SAVING RULES

In line with IOGPs objective to improve the level of industry-wide adoption across the global oil and gas industry and for the benefit of standardization to achieve Goal Zero Industry; SHELL has adopted the simplified 9 Life Saving Rules which have a broader scope focusing on potential for harm to people and gives greater Individual and team ownership.

The Life-Saving Rules support the Goal Zero journey by driving a more compliant culture, underpinned by the three HSE Golden Rules Comply, Intervene, and Respect.

The Life-Saving Rules exist in order to do exactly what they say: save lives!

LIFE SAVING RULES



7.02 SAFETY REQUIREMENTS

1. Responsibilities for the safe conduct of operations on board the tanker whilst at the Bukom Wharves / SBM rest with the Master. Furthermore, since the Terminal's personnel and property and other shipping may also suffer serious damage in the event of an accident onboard your tanker, the Terminal requires the Master's full co-operation and understanding of the safety requirements set out in the Ship / Shore safety check list.
2. The safety requirements set out in the check list are based on safety practices widely accepted by the oil and tanker industries. The Terminal accordingly expects the Master and the crew of the tanker to adhere strictly to such practices throughout the tanker's stay at the Bukom Wharves / SBM. For its part the Terminal will ensure that its personnel do likewise and will co-operate fully with the Master in the mutual interest of a safe and efficient operation.
3. In order to ensure compliance with these safety requirements, the Shore Loading Officer shall, before the start of operations and thereafter from time to time during cargo operations, join one of the tanker's officers in a routine inspection of cargo decks and accommodation spaces. The Master shall make an officer available for this inspection.
4. If the Master or any of his crew observe any infringement of these safety requirements by the Terminal's staff or agents onboard the tanker. The master shall bring this to the attention of the Duty Marine Officer (DMO) who will act as the master's contact with the Terminal during the tanker stay at the berth.
5. As part of the Terminal's commitment to Shell's vetting system, a Terminal inspection may be carried out during cargo operations. A report will be forwarded to the Managers of the vessel for corrective action which will be verified again during the vessel's next call to Bukom Terminal.
6. No fire-fighting or lifesaving appliances may be immobilised and/or removed for servicing ashore whilst at the Bukom Wharves / SBM, unless temporary substitute equipment is provided. Such equipment must be in its proper place and maintained in a state of readiness for immediate use.
7. If the Master feels that any immediate threat to the safety of the tanker arises from any action on the part of the terminal or from any equipment under its control, the Master shall be entitled to demand immediate cessation of operations.
8. Vessel coming to SBM requires its midship/hose handling crane sheave on the boom head is to be protected as to prevent the runner wire from slipping/jumping off during lifting of the SBM hoses.

WARNING: In the event of continued or flagrant disregard of these safety requirements by the tanker, the company reserves the right to stop all operations and to order the tanker to vacate the berth to enable appropriate remedial action to be taken by the Owner and / or Technical Manager of the ship.

7.03 SHELL GENERAL BUSINESS PRINCIPLES

The Shell General Business Principles describe the core values of the Shell Group - honesty, integrity and respect for people - its responsibilities, and the overarching principles and behaviours by which Shell companies do business. Every Shell Employee, Contractor Staff and Company providing services to Shell are required to comply with this principle consistently.

In observing the above principle:

- You must not offer, pay, make, seek or accept a personal payment, gift or favour in return for favourable treatment or to gain a business advantage;
- You must not make any facilitation payments;
- Report to DMO if any such behavior observed.

7.04 INCIDENT REPORTING

In the event there is an incident onboard whilst a vessel is at the terminal, the incident reporting as detailed in section 2 (In Case of Emergency) should be used in order for the terminal to render support and reduce the potential impact on operations.

7.05 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following minimum PPE should be adhered to by ship's personnel while on duty alongside Bukom wharves and SBM:

- Boiler suit or trousers and long-sleeved shirt.
- Suitable safety helmet
- Safety shoes or boots with steel toe caps.
- Safety Glasses/Goggles
- SOLAS approved lifejacket/PFD shall be worn when performing tasks that poses risk of falling into water.

NOTE: For performing visual draft checks at the wharf, terminal requires ship's staff to don SOLAS approved lifejacket/PFD. Use of life/work vest is NOT PERMITTED.

With the exception for carrying out tasks critical to vessel's safe operations at our terminal, it is prohibited to work outside the safety handrails or overside. It is also prohibited to enter any enclosed space such as Cargo/Ballast tanks and void spaces for the purpose of inspection or climbing masts for carrying out inspection / maintenance. Working aloft is prohibited whilst alongside Bukom wharves.

Personnel engaged in operations are actively encouraged to utilise PPE to the fullest extent during cargo transfer, hose handling and mooring operations. These includes the wearing of safety helmets and safety goggles. Ships should establish the PPE requirements for visitors, and these should include appropriate clothing, safe footwear, SOLAS approved lifejacket and safety helmet.

7.06 SAFE ACCESS

Terminal provides shore gangway for safe access between terminal and vessel. In the event the shore gangway is not available, ship must provide its own gangway and shall secure a safety net under the gangway. The safety net should extend from the ship's side at the boarding point to the bottom landing platform. If shore gangway is used, ship to provide a strong landing point for the shipboard end of the gangway and access steps with handrails (bulwark ladder) should be provided to enable safe access to and from the deck. The provision and use of the shore gangway are on condition that users of gangway do so at their own risk.

SEPL shall not be liable to the vessel, Master or any party in respect of any injuries, claims, damages or liabilities arising out of the use of the shore gangway regardless of the cause of such injuries, damage or liability.

An accommodation ladder or pilot ladder should be kept rigged on the offshore side but due to security concerns, the ladder/ladders to be raised to deck level when not in use and deployed for emergency escape and only when necessary.

7.07 SECURITY

Pulau Bukom is gazetted as a protected place under associated Regulations and Bukom waters are prohibited areas as declared under MPA Port Marine Circular no. 06 of 2018., the Islands of Pulau Bukom Besar, Pulau Bukom Kechil, Pulau Ular, SBM and the reclaimed areas adjoining Pulau Bukom Kechil and Pulau Ular are designated a 'restricted zone' and unauthorized access is an offence.

Vessel coming to Bukom Terminal must have a valid International Ship Security Certificate in compliance with ISPS code and record of last 10 ports of call including Ship to Ship transfer to be readily available. Master to ensure all areas onboard the vessel that required for terminal operations (such as gangway, manifold, walkway to accommodation, etc.) have been cleared from the Razor Wires, Scanjets or other materials used for Anti-Piracy.

In line with the ISPS Code, the following three security levels are adopted:

- a) Security Level 1 – Normal – The level for which standard security measures shall be maintained at all time.
- b) Security Level 2 – Heightened – The level for which appropriate addition measures shall be maintained for a period of time as a result of heightened risk of a security incident. For the Petroleum Berth, this will include additional security guards and patrols with greater scrutiny of port users.
- c) Security Level 3 – Exceptional – The level for which further additional security measures shall be maintained for a limited period of time when a security incident is probable or imminent, although it may not be possible to identify the specific target. For the Petroleum Berth, this may result in the removal of a ship from the berth or the delay in a ship berthing.

In order that ship and Port security plans can be coordinated, information will be exchanged during the pre-transfer conference.

Only authorized persons, or those with valid entry permit issued by the Terminal, shall be allowed access to the Installation Areas and such persons must comply with any restrictions imposed upon them.

Un-authorized personnel including ship's staff are not allowed to enter the shore installations, landing or transiting at Bukom. Agents, however, can have access to the vessel or arrange launch boat for crew via offshore side, provided the launch boat with valid MPA entry permit is used and approval obtained from Movement Control Room and Bukom Police for each visit. Approval will be granted on a case-by-case basis subject to a security assessment. Such visit shall be kept to a minimum and boat services during dark hours should be avoided as far as possible.

The use of cameras or video cameras anywhere on Bukom is prohibited. It is prohibited to take any photographs or videos of the shore facilities.

7.08 LAUNCH BOAT SERVICES APPROVAL

Master to liaise with his agent for arranging service launch with valid MPA entry permit. The service launch must report to Bukom Police Station before proceeding to the vessel and prior leaving Bukom.

Except pilot boat; other boats and service launches for LPG and C2 vessels are not permitted at any time whilst alongside at Bukom due to terminal's "EXCLUSION ZONE" requirement of 260 meters for C2 vessels and 60 meters for LPG vessels.

Boats and service launches in hours of darkness to the wharves and SBM are to be avoided. If needed due to operational reasons / exceptional circumstances, explicit prior written approval from Duty Marine Officer is required. Day light restriction does not apply to boats arranged for cargo surveyors and vessel's agents requiring access due to having legitimate business in connection with cargo operations onboard the vessel.

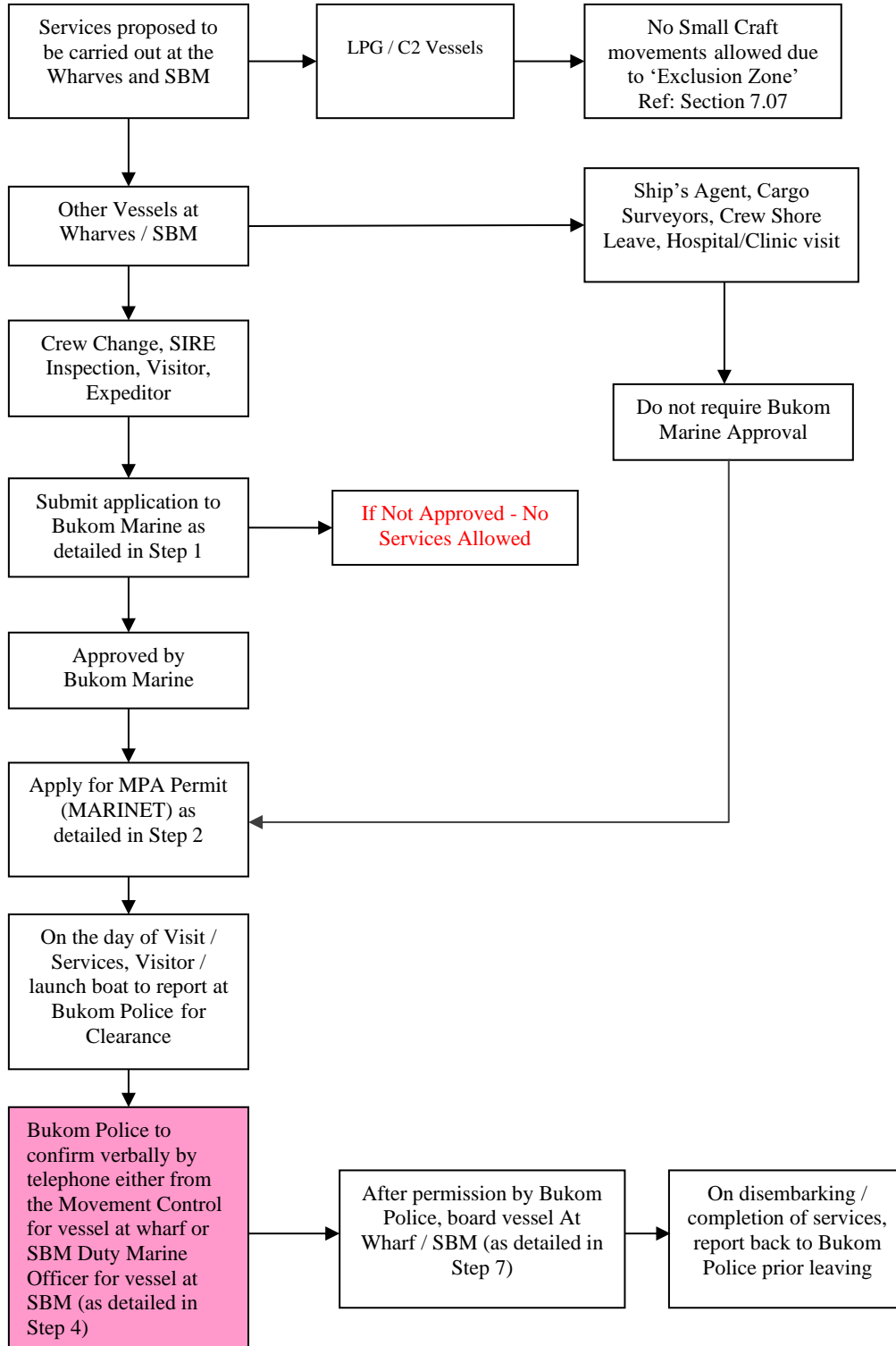
In all cases (with the exception of Point 5 below), boats and crafts providing services to the vessels at Bukom Wharves and SBM, the following procedures apply:

1. The agent of the respective vessel should seek approval by email to DMO (SEPLOP-Marine-Clearance@shell.com) at least one working day prior vessel's arrival. Each request will be assessed on its own merits and approval would be given to the agent with the message copied to Bukom Police.
2. Closer to the vessel's arrival date, agents should apply MPA Permit (MARINET) for the launch boat to enter the terminal.
3. Boats are not allowed to attend the vessels at wharves / SBM directly and leave without reporting at Bukom Police Station.

4. On the day of attendance, the launch boat (including those exempted from prior approval by Marine Department) is required report to Bukom Police with the copy of the approved MARINET. Upon sighting the MARINET and confirmation from MCR or SBM DMO, Bukom Police will give approval to the launch boat for attending the vessel at the wharf or SBM.
5. Following services do not require pre-approval from Bukom Marine Department (with an exception for wharf 11 and 13 (LPG and C2 Vessels) and wharf 12 when handling LPG vessels, where no visitor is allowed to board or disembark from the vessel:
 - a. Ship's agent attending to vessel for arrival or departure formalities;
 - b. Cargo Surveyors attending onboard the vessel for cargo operations;
 - c. Crew shore leave / Hospital/Clinic visit (Movement Control or SBM DMO to be notified in advance).
6. No boat will go alongside any wharf for the purpose of landing personnel or equipment onto the wharf.
7. No boat providing service to a vessel will wait alongside a wharf / SBM. Any boat providing services to a vessel on any of the Bukom wharves / SBM will attend that vessel on the seaward side only or on starboard side of vessels moored at the SBM. Alongside time should be kept to a minimum as possible and only sufficient enough to carry out the proposed services. Waiting alongside to vessels at wharves and SBM is strictly prohibited. In case of any waiting, such boat will proceed to clear the area at least 100 meters away from the vessel and wait in that area until requested by the vessel to re-approach. Only hand carried packages or equipment are allowed to be off-loaded from boats alongside the vessel.

In connection with the foregoing, owners / agents are advised that service launch in attendance at wharves/SBM should only be considered on an exceptional basis and every effort should be made to service the vessel prior to her arrival or after departure at Bukom.

Please refer to the launch approval flow chart below



7.09 CREW SHORE LEAVE / HOSPITAL/CLINIC VISIT

Crew shore leave / Hospital/Clinic visit is permitted via seaside during daylight hours only at Bukom wharves and SBM except for LPG / C2 vessels. Movement Control Room to be notified in advance through shore radio.

Master to liaise with his agent for arranging service launch with valid MPA entry permit. The service launch must report to Bukom Police Station before proceeding to the vessel and prior leaving Bukom.

Vessel's crew is required to wear SOLAS approved Lifejacket/PFD and covered shoes when embarking/disembarking from the vessel.

7.10 CREW CHANGE

Master/Agent should perform crew change at Singapore anchorage as first option.

If crew change is to be performed at Bukom, agent of the vessel should seek approval by email to DMO (SEPLOP-Marine-Clearance@shell.com) at least one working day prior vessel's arrival. The application will be assessed on its own merit.

If the application is approved, crew change can be carried out via seaside during daylight hours at Bukom wharves and SBM except for LPG / C2 vessels.

Master to liaise with his agent for arranging service launch with valid MPA entry permit. The service launch must report to Bukom Police Station before proceeding to the vessel and prior leaving Bukom.

Vessel's crew is required to wear SOLAS approved Lifejacket/PFD and covered shoes when embarking/disembarking from the vessel.

7.11 SUPERINTENDENT, TECHNICIANS (VISITORS)

Agent of the vessel should make an application by email to DMO (SEPLOP-Marine-Clearance@shell.com) at least one working day prior vessel's arrival for the visit. The application will be assessed on its own merit.

If the application is approved, visitors must embark and disembark from the vessel via seaside during daylight hours at Bukom wharves and SBM except for LPG / C2 vessels.

Master to liaise with his agent for arranging service launch with valid MPA entry permit. The service launch must report to Bukom Police Station before proceeding to the vessel and prior leaving Bukom.

Visitors are required to wear SOLAS approved Lifejacket/PFD and covered shoes when boarding / un-boarding from the vessel.

7.12 SIRE INSPECTION

Terminal allows Shell and third-party SIRE inspection on board vessel while alongside at the wharves and SBM. Vessel Owners/Master should submit the SIRE Request Form (Appendix 1) along with Appointment Letter from the Oil Major by email to DMO (SEPLOP-Marine-Clearance@shell.com) at least three working days prior vessel's arrival. Terminal will review and approve on case by case basis. If approved, the SIRE inspector must embark and disembark from the vessel via seaside during daylight hours at Bukom wharves and SBM. Master to liaise with his agent for arranging service launch with valid MPA entry permit. The service launch must report to Bukom Police Station before proceeding to the vessel and prior leaving Bukom.

SIRE Inspection for LPG/C2 vessels are allowed provided the arrangement has been made for the SIRE Inspector to embark/disembark the vessel outside Bukom Waters.

During the inspection, testing/inspection of various safety equipment is allowed except for the following:

- Testing of cargo tank alarm on the tank that is currently in use for cargo transfer operation;
- Testing of Lifeboat engine;
- On load test of the Emergency Generator.

Master shall inform MCR prior carrying out such tests.

Master to ensure that the inspection shall not in any way interfere with the safe cargo transfer operations.

7.13 PROVISION & STORES

Delivery of provision and stores are not allowed for vessels at wharves.

Delivery of provision & stores at SBM is permitted during daylight hours only, at least 6 hours after commencement of cargo operation and no later than 3 hours prior completion of cargo.

Delivery of provision & stores shall not interrupt / delay the discharge operations onboard the vessel including outbound pilot which is normally within 2 hours after completion of discharge.

If the delivery of provision and stores are planned during cargo transfer operation, a risk-assessment should be completed for 'Simultaneous Operations' and tool-box talk to be carried out prior to this activity. Stores should only be picked up using the utility crane/gantry on poop deck and the midship cargo hose handling crane should not be used.

The action and behavior of any boat attending to a vessel will be the responsibility of the Master who, at all time, will remain responsible to the Terminal for ensuring that launch operation is conducted in accordance with Industry Safety Practices. No smoking and naked lights will apply to all boats and launches whilst in Bukom waters.

7.14 DRUGS / ALCOHOL

The company recognizes that the abuse of Drugs and Alcohol jeopardize individual's ability to perform his/her ability to work safely and correctly.

In compliance with Shell Life Saving Rule, whilst vessel at Bukom Terminal, consumption of Drug and Alcohol are STRICTLY PROHIBITED.

7.15 SMOKING AND NAKED LIGHTS REQUIREMENTS

Smoking (including E-Cigarettes) is only allowed in designated smoking rooms on board the vessel as specified by the Master in consultation with the terminal. No smoking is allowed at the wharves and in the refinery area. Approved Smoking Rooms shall have a Notice conspicuously exhibited on the door. Smoking rooms ports should be kept closed and doors into passageways should be kept closed except when in use

Accommodation spaces which are directly accessible from the deck should not be designated as smoking rooms

Naked fire cooking (gas cylinders) is prohibited. Maintenance or repairs involving welding, burning, the use of abrasive tools, chipping or scraping, are strictly prohibited.

7.16 SAFETY DATA SHEETS (SDS)

Terminal will provide the relevant SDS to the vessel before it commences loading. For cargoes to be discharged, it is ship's responsibility to provide the SDS to the terminal. The ship should also advise the terminal and surveyors whether the previous cargo contained any toxic substances.

As minimum, the following information should be available in the SDS:

- A full description of the physical and chemical properties, including reactivity, necessary for the safe containment and transfer of the cargo
- Action to be taken in the event of spills or leaks
- Countermeasures against accidental personal contact
- Fire-fighting procedures and fire-fighting media

7.17 HYDROGEN SULPHIDE (H₂S) & HFA PRECAUTIONS

All crudes received at Bukom are suspected to contain H₂S. It is important to distinguish between concentrations of H₂S in the atmosphere, expressed in ppm by volume, and concentrations in liquid, expressed in ppm by weight. Predicting the likely vapour concentration from any given liquid concentration is not possible. In view of high levels of H₂S detected in crude, fuel oil and Bitumen cargo ullage spaces, please monitor ullage space atmosphere by suitable means, e.g.: Draeger tubes, to determine level of H₂S and take the necessary precautions as required and advise Terminal.

For vessels calling wharf 10 for loading or discharging and for vessels coming to load at any of the Bukom wharves, H₂S concentration should be purged as low as possible but not more than 5 PPM.

Safety precautions by vessel at Wharf 10

Due to the proximity of Wharf 10 to offices, residential areas and ferry passenger terminals, vessels are not allowed to handle or have on board on-carriage volatile cargoes (flash point below 60°C Close Cup Method) even under inerted conditions. Vessel must arrive with all tanks (including slop tanks) in gas-free condition or purged and inerted (tanks purged to below 2% Hydrocarbon content by volume, oxygen content less than 8% by volume and H₂S concentration as low as possible but not more than 5 PPM.)

Vessels at Wharf 10 are only allowed to have a small quantity of volatile slop in their slop tank onboard and the tank must be fully inerted and kept under vapor isolation from rest of the tanks. Discharge of volatile slop is not permitted.

Handling of High H₂S Cargo

For vessels coming to discharge at wharves other than wharf 10, subject to prior written approval from Duty Marine Officer, vessels arriving with high H₂S (>10 PPM) in their ullage spaces would be berthed subject to following conditions being met:

- 1) Vessel's IG system is to be fully operational and under normal circumstances, venting of cargo vapor is not permitted from vessel;
- 2) Vessel is to conduct risk assessment against potential exposure of H₂S to personnel / visitors and implement required control measures to reduce the risk to ALARP;
- 3) Guidance given in ISGOTT 6th Edition, section 1.4.6 and section 1.4.6.4 should be complied with;
- 4) Maintain cargo tank pressures within acceptably low limits prior arrival within port limits and throughout the cargo transfer operation so as to avoid accidental release of H₂S concentrations to the atmosphere;
- 5) All delays herewith with any additional measures taken due to the nature of this cargo will not be for Terminal's account.

Prior written approval should be applied to DMO and the following documents to be submitted for his review:

- 1) H₂S content in the vapor space of cargo tanks
- 2) SDS for the cargo
- 3) Risk Assessment as required for handling high H₂S cargo

Except wharf 10 where it is not permissible to have H₂S in vapor space of >5 PPM, following precautions need to be adhered to for when handling crude oil, fuel oil and products containing high levels of H₂S (>10PPM in in the vapor space) at the SBM and alongside wharves:

- Cargo Surveyors, Agents and all other personnel on the vessel are to be warned of H₂S content of cargo prior to proceeding to the vessel
- Tool-box meeting to be carried out with all personnel involved in the cargo operation
- The vessel should display a warning sign "H₂S Danger" at the ship's gangway entrance
- Two Self-Contained Breathing Apparatus (SCBA) sets with spare cylinders and Two EEBD sets are to be provided by the vessel and stationed at the manifold area.
- All personnel working on deck must wear personal H₂S gas monitor
- If the H₂S personal gas monitor alarm is activated while onboard the vessel, all personnel are to immediately evacuate the area and proceed to a safe location upwind of the H₂S source.
- Personnel should always be on the upwind side when sampling, ullaging, ROB dipping and connecting/disconnecting hoses. When for operational reason (example hose connection disconnection) it is not possible to stand upwind, then all efforts should be made to stand crosswind but never in the down wind direction.
- Closed Loading Operations - All cargo operations by vessels calling at Bukom wharves and SBM require to be carried out under "Closed" condition. If for any reason "Closed" operations cannot be maintained, all cargo operations are to be stopped and DMO is to be contacted immediately for advice. In no case whatsoever, should cargo operations proceed without it being carried out under closed conditions. If the defect cannot be rectified, consideration is to be given to shift vessel to anchorage to enable repairs.
- Sampling, ullaging and ROB dipping - If for any reason, a vapor free atmosphere cannot be guaranteed during sampling, ullaging and ROB dipping, the task should be suspended and DMO is to be contacted immediately for advice. Task is to only proceed after a thorough risk assessment is completed and mitigations verified by the DMO / SLO. In such case where a vapor free atmosphere cannot be guaranteed, donning of SCBA sets is mandatory for all personnel directly exposed to the H₂S vapor during the sampling operation.
- Hose Connection / Disconnection – Before initiating connection / disconnection of loading arm / hoses it is imperative that it is positively ascertained that all isolation valves are holding, and the line section is well drained with no remaining cargo in the pipe section outboard of the ship's manifold valve. In order to test for a well-drained manifold section and a vapor free atmosphere, the manifold drains and pressure gauge can be used to ascertain condition. If a pressure / presence of cargo is detected, then draining through closed ship system is to continue till a well-drained condition can be positively verified. If in any event that a vapor free atmosphere cannot be reached (example presence of cargo / pressurized vapor when removing manifold blanks for connecting the cargo hose /

loading arm, draining manifold lines to open containment, etc.), the connection / disconnection of loading arm / hoses is to be suspended and DMO is to be contacted immediately for advice. Task is to only proceed after a thorough risk assessment is completed and mitigations verified by the DMO / SLO. In such case where a vapor free atmosphere cannot be guaranteed, donning of SCBA sets is mandatory for all personnel directly involved in the hose connection / disconnection.

- For the afore mentioned operations, vapor free condition means when there is minimal release of vapor such that the LEL is less than 2% and the H2S content less than 5 PPM in the immediate vicinity.
- Personnel required to use SCBA should be trained in its use and in the event that personnel normally performing the task / those present at work site are not trained, then the job is to be kept suspended till suitably trained personnel can be identified to carry out the task (vessel staff may be considered).
- No personal visitors allowed to the vessel. If essential to the vessel's operations, visitors to the vessel on business are to be instructed by vessel agents and Master of the presence of H2S.
- Vessels with H2S in their vapor space >10 PPM should arrive at the terminal with cargo tanks pressure at acceptably low limits to avoid accidental / intentional release of H2S concentrations to the atmosphere. It should be noted that the tank vapor pressure will rapidly increase if vapor space is exposed to heat or the product is agitated. The low cargo tank pressure in cargo tank will ensure that any increase in tank vapor pressure stays below the PV valve setting for venting and thereby does not necessitate venting whilst the pre-cargo operations activities like gauging, ship shore conference and hose connection is completed. All efforts should be made by all parties to start the cargo with the minimum delay after berthing.
- When loading high H2S cargoes to vessels at wharves / SBM, Mode of venting is to be agreed with terminal representatives (SLO / Marine Officer). Venting to the atmosphere from a relatively low tank pressure should be avoided, particularly in calm wind conditions. Cargo loading should be stopped if there is no wind to disperse the vapors or if the wind direction takes cargo vapors towards the accommodation.
- During discharging, cargo tank pressure to be managed such that there is no need for any venting during the cargo operation. Taking in view that excessive cargo vapors will be generated during Crude Oil Washing (COW), the tank pressure should be maintained in the lower range such that during the entire crude oil washing the tank pressure does not exceed safe limit necessitating venting of the tank pressure. Certain crudes are not fit for crude oil washing (example Maya Crude) and permission for COW will be declined by the attending Marine Officer. For grades, where COW is permitted, it should be planned such that most of the COW is done concurrently with discharge and tank pressure controlled to eliminate the need for any venting. If venting is required to be carried out, then all personnel onboard and on deck should be informed and exposure on deck during the venting should be minimized having only minimum required staff on deck standing upwind and clear of the venting area. In still air conditions, consideration should be given to stopping cargo operation.

H2S GAS RELEASE (PRECAUTIONS FOR VESSELS AT WHARVES 7 & 8)

The SRU (Sulphur Recovery Unit) and the Super Claus are situated at Rd. 166 that is opposite to Wharf 7 & 8. The SRU and Super Claus operate continuously on a 24-hour basis and H2S gas is stripped in a close loop system. Precautions are taken to prevent any leakage of H2S gas. However, in the event of any H2S gas leak, an alarm (howler) will be sounded to indicate the emergency. The howler will sound a two-tone hooting alarm. The howlers are located at the entrance gate of Wharf 8 and at Rd 166 between Wharf 7 & 8 and between Wharf 8 & 9.

In the event of such emergency you are advised to take the following action:

1. Alert your crew and all others to remain onboard and inside the accommodation with all the opening closed and standby
2. Notify other personnel onboard e.g. surveyor, shipping agent to refrain from leaving the vessel or Wharf and keep away from Rd. 166 (the road off Wharf 7, 8, 9).
3. Stop cargo operations until emergency all clear is given.
4. Ensure all external doors are shut and air-conditioning unit in internal circulation mode.
5. Take all precautions to prevent ingress of leaked gas into ship's accommodation.
6. Maintain listening watch on ship/shore radio and VHF Channel 19.

Note In a very serious gas release you will be advised by shore personnel regarding movement of your vessel for safe evacuation.

HFA GAS RELEASE (FOR VESSEL AT WH13)

The HFA (Hydrofluoric Alkylolation Unit) are situated along Rd 80 that is directly opposite Wh13. The HFA unit operates continuously on a 24-hour basis and uses Hydrofluoric acid as catalyst in a close loop system. Precautions are taken to prevent any leakage of hydrofluoric hydrocarbon gas. However, in the event of any HF gas leak, Bukom General Siren alarm will be sounded to indicate the emergency and terminal will inform vessel accordingly.

In the event of such emergency you are advised to take the following action:

1. Alert all your crew and all others to remain onboard and inside the accommodation with all openings closed and standby;
2. Notify other personnel onboard e.g. surveyor, shipping agent to refrain from leaving the vessel or wharf and keep away from Rd 51 and Rd 80;
3. Stop cargo operations until emergency all clear is given;
4. Ensure all external doors are shut and air-conditioning unit in internal circulation mode;
5. Take all precautions to prevent ingress of leaked gas into ship's accommodation;
6. Maintain listening watch on ship/shore radio and VHF Channel 19.

Note: In a very serious HF gas release you be advised by shore personnel to go into "Dead Ship Mode" condition.

7.18 BENZENE PRECAUTIONS

- Benzene is an aromatic hydrocarbon and they are components in varying amounts in many petroleum cargoes, e.g. gasoline, gasoline-blending components, reformat, naphtha and crude oil.
- Vessel is required to comply with ISGOTT 6th Edition, sections 12.1.6.6 (closed loading) and 12.8.4 (measuring and sampling) when engaged in cargo operations involving products containing BENZENE.
- Benzene is known as a strong carcinogen and known to cause leukemia. Vessels carrying liquids in bulk with a BENZENE content 0.5% or more are required to comply with the minimum standards established by IMO (MSC/Circ.1095 "Revised Minimum Safety Standards for Ships Carrying Liquids in Bulk Containing Benzene")
- Vessel is required to comply with ISGOTT 6th Edition, section 1.4.5.2 when carrying cargoes with a BENZENE content of less than 0.5%

7.19 STATIC ACCUMULATOR

The ship/shore safety checklist will apply throughout the ship's stay alongside. All procedures in respect to the handling of cargo or of ballast, including precautions, should be established and agreed to during the pre-planning discussion. Any proposed changes or deviation to operational plan should be laid down in writing.

The initial and maximum loading rates, topping off rates should be agreed, having regard to:

- The maximum allowable pressure and flow rate
- Avoiding accumulation of static electricity

Clean Petroleum Products such as Gasoline, Jet and Chemical solvent such as IPA are classified as STATIC ACCUMULATOR. In addition to the foregoing precautions, closed draining method shall be used at manifold and open draining into drums are not allowed.

If the static accumulation properties of the substance handled and the situation in the tank so requires, no conducting object (notably metallic sounding rods, sampling apparatus, steel ullage tapes and synthetic fibre ropes) should be inserted into that tank during loading and during a period of at least 30 minutes after the cessation of loading (applicable to non-inerted ships only). Synthetic fibre ropes should not be used with sampling cans or other sounding equipment.

8. GENERAL INFORMATION

Pulau Bukom Refinery is owned and operated by Shell Eastern Petroleum Pte Ltd Singapore. It is situated in position Lat. 1° 14' N Long. 103° 46' E

Terminal's local time zone is on UTC +8 and no daylight-saving time (Local Time in Singapore).

The Marine Terminal consists of 13 main jetties and one SBM. 12 jetties are located at Pulau Bukom Besar and 1 jetty at Pulau Ular while the SBM is approximately 2 miles to the South of the island.

Wharves maximum LOA & Displacement, safe draft and acceptable height of the manifold above water line are shown in the Berth Information Section 9. Ship's own use bunkers are not available ex-pipeline from the wharves; however, subject to meeting terminal requirements, bunkers can be supplied through approved bunker barges for vessels alongside wharves except for LPG and C2 Vessels. An advance clearance is required from the Marine Department for supply of bunkers. Refer to section 11.21 for the information on Concurrent Bunkering at the terminal.

Terminal's working language is English Language.

8.01 VESSEL ACCEPTANCE

All tankers nominated for the Terminal must be capable of operating within the physical limitations of the berth as detailed in attached mooring plans

All tankers must declare the main engines can operate full astern, mooring arrangements meet OCIMF guidelines, and that the crane is operational to the stated SWL limitation. In addition to any other conditions which may be prescribed by regulation, law or enactment, any and all facilities and assistance of any sort whatsoever provided by the terminal in connection with the terminal facilities whether or not any charge is made by the terminal therefore, are provided subject to the following conditions:

Shore Loading Officers / Mooring Masters are deemed to be servants of the tanker owner, and neither the terminal nor their servants, agents or contractors (in whatsoever capacity they may be acting) shall be responsible for any loss, damage or delay arising from the use of the Terminal by any tanker including but not limited to any assistance, advice or instructions given or tendered in respect of any tanker, whether by way of pilotage or berthing services, the provision of navigational facilities, including buoys or other channel markings or otherwise, even if such loss, damage or delay shall have been caused wholly or partly by the negligence or other default of either the terminal, it's servants, agents or contractors. In all circumstances the Master of any tanker shall remain responsible on behalf of his owners for the safety and proper navigation of his tanker

All vessels are expected to have on board the latest edition of the "INTERNATIONAL SAFETY GUIDE FOR OIL TANKERS AND TERMINALS (ISGOTT)". In case of any concerns, Call Telephone No: +65 6263 4424 or contact Bukom on VHF Channel 19 or the Shore walkie-talkie.

8.02 Tidal Information

Tidal information for Bukom can be found in the Singapore Tide Tables and Port Information Booklet published by MPA. The tidal range at Springs is approximately 3.3 meters and current velocities can approach 3.0 knots.

For information on tidal streams at Bukom, reference should be made to predictions for Jong Fairway.

Shipmasters should be aware that counter currents at Pulau Bukom are experienced on strong East going stream. For practical purposes, when the predicated rate of the East going stream exceed 1 knot the counter current at Bukom is assumed to exist from Berth No. 10 at the Eastern end to Berth No. 12 at the Western end. The counter current normally starts about two hours after commencement of the Ebb stream and finishes at the next turn of the tide.

9. BERTH INFORMATION

Please refer to the table below:

BERTH	Max LOA (Meter)	AT ZERO TIDE		Max Manifold Height waterline to center of Manifold (Meter) For Hoses (H) Loading Arm (A)
		Approach Control Depth (Meter)	Max. Draught @ Berths (Meter)	
1 E	110		10.6	(A) 8.5
1 W	110		10.6	(A) 8.5
2	170		8.5	NA
3	170		10.8	(A) 16.8
4	190		11.6	(H) 13.2
5	190		12.6	(H) 15.4
6	275	15.1	16.2	(H) Crude, HSSR & LSFO 20.1 / (H) Gas Oil, Jet, Kerosene & Naphtha 15.7
7	245		13.3	(A) 20.3
8	275	15.1	16.1	(A) 19.9
9	190		12.8	(A) Jet 8.7 / (A) Daco, Lubes & Slack Wax 16.5 / (A) Liquid Sulphur 7.7
10	265	15.1	15.2	(A) Bitumen 13.3 / (A) HSFO 23.1
11	120		5.2	(A) 9.0
12	120		12.7	(A) LPG 9.5 / (A) Jet 8.2 * 6.0m max freeboard only for (A) Lubs / Daco / Slack Wax
13	155		10.2	(A) 13.7
SBM	345	22.8	23.5	(H)

Wharf	Maximum Displacement (M.Tonnes)	Product Handled	Max Total Flow Rate of Loading Arms/Hoses for respective Product(m3/h)
1E	10,000	Gas Oil	500
1W	10,000	Bitumen	600
2	54,000	--	--
3	50,000	Gas Oil / Mogas / Jet	2000 / 4000 / 2000
4	44,000	LSFO / Gas Oil / Mogas / Jet / IPA	1500 / 3000 / 4500 / 3000 / 540
5	55,000	Gas Oil / Mogas / Jet / IPA	4500 / 3000 / 1500 / 540
6	193,000	Crude / LSFO / Gas Oil / Jet / Naphtha	4500 / 4500 / 4500 / 3000 / 2200
7	100,000	Crude / Gas Oil / Jet / Mogas	2200 / 4400 / 2400 / 2400
8	180,000	Crude / HSSR / Gas Oil / Jet / Mogas / Naphtha	5600 / 4400 / 2400 / 1200 / 2400 / 2200
9	65,000	Jet / Lube Oil / DACO / Slack Wax / Liquid Sulphur	1000 / 4000 / 2000 / 2000 / 500
10	150,000	HSFO / Bitumen	4000 / 800
11	8,000	LPG	600
12	10,500	Jet / Lube oil / Daco / Slack Wax / LPG	1000 / 2000 / 1000 / 1000 / 600
13	21,500	Ethylene	720
SBM	355,000	Crude	12000

Below information is for guidance only:

Water Density – The approximate water density alongside our wharves is 1.023.

Freeboard Requirement - Minimum Freeboard Requirement for all wharves is 1.0 meter, except wharf 10, where minimum freeboard requirement is 1.5 meters and wharf 13 minimum freeboard requirement is 2.0 meters.

Wharf Spacing – Minimum clearance to be maintained between vessels at adjacent wharves is 30 meters.

Minimum UKC – As stipulated by Port Authority:

Alongside berth for all vessels: 0.3 M

For maneuvering (Below 3000 GRT): 0.6 M

For maneuvering (Above 3000 GRT): 1.0 M

10. PRE-ARRIVAL INFORMATION**10.01 TUGS REQUIREMENT**

Usage of tugs for ships movement at Bukom Terminal is in line with the recommendation by MPA. Ordering of Tugs are strictly done by Bukom Movement Control; agents are not required to book tugs for vessel movement at Bukom Terminal, unless specifically instructed by Bukom Movement Control.

1. For vessels LOA more than 100 meters, at least 2 big tugs (TUG A / TUG B) need to be deployed. Additional tugs may be deployed for specific vessel types as required under MPA Pilotage guidelines.
2. For vessels of LOA of 100 meters or less, 1 tug would be deployed.
3. All LPG/C2 vessels to be assisted by 2 big tugs (TUG A/ TUG B), regardless of bow thrusters' condition.

Below are the tug types normally used at Bukom wharves and arranged by Bukom operations:

	Bollard Pull/Horsepower	Towing Rope	Additional Remarks
Tug A	Min 48 t	Tug's Line	Class 1 – Fire Fighting + Oil Spill Booms
Tug B	Min 48 t	Tug's Line	Class 1 – Fire Fighting + Oil Spill Booms

A vessel equipped with suitable bow thruster, in good working condition, may dispense with the need for a tug in that position subject to the approval from the attending pilot.

Any deviation to the above requirement would require approval from Bukom Marine Manager.

Mooring Crew - Mooring crews and line handling boats are arranged by the terminal and are automatically allocated when vessels are called in to berth / unberth. Two-line handling boats are available at Bukom to support the mooring of all vessels at Pulau Bukom Terminal.

10.02 PILOTAGE

The Maritime Port Authority of Singapore (MPA) Act 1996, section 60 provides that:

1. Every vessel when navigating in any pilotage district or part thereof shall be under pilotage and the owner, agent or master of the vessel shall comply with that requirement.
2. A vessel while been moved within any area of the port which is, or forms part of a pilotage district shall be deemed to be a vessel navigating in a pilotage district.
3. The Authority (MPA) may, if it appears to the authority to be necessary, exempt any vessel or class of vessels while navigating in any pilotage district from being under pilotage subject to such conditions as it may think fit to impose.

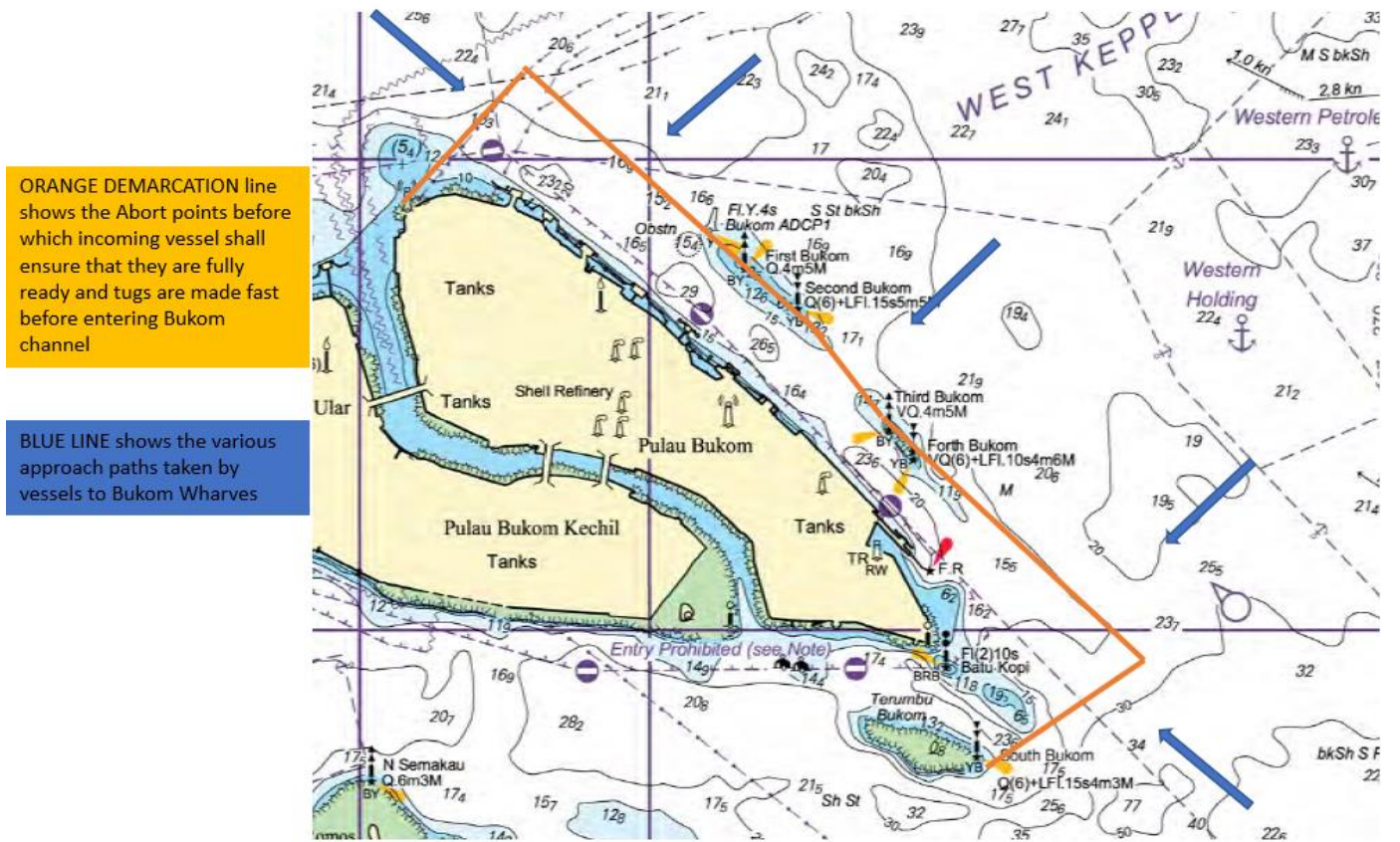
There are 7 pilot boarding grounds for vessels coming into port and details of which can be extracted from the Port Information Booklet, ALRS, Sailing Directions and Routeing Chart. Requests for pilotage services should be placed directly with the pilotage service provider which is PSA Marine. Agents should be consulted for pilot booking, who in turn will book pilots and advise the vessel on pilot boarding time and location.

All vessels Master are advised not to impede the safe passage of deep draft vessels in the restricted channels of the port.

All vessels berthing at Bukom wharves need to have a PSA pilot onboard. The PSA pilot could either be the residential PSA Pilot in Bukom which will then be arranged by the Bukom Movement Control Room or directly from PSA which will then be booked by the agents after receiving instructions from Bukom Movement Control Room. For small coaster port limit vessels which have been assessed by the Bukom Marine Team, the pilot exempted Master does not need to have a PSA pilot onboard for berthing / unberthing to Bukom wharves provided he is within the validity period from the last assessment. In both the above cases mooring and tug services will be arranged as required by the Bukom Movement Control Room.

NOTE: As per STCW Code Part A, Chapter VIII – Watchkeeping: Owners and Master reminded that despite the presence of Pilot on board does not relieve the Master or the Officer In charge of the Navigational Watch from their duties and obligations for the safety of the ship. The Master Pilot Information Exchange shall be completed prior making the approach to Bukom Terminal.

Speed and Approaches – Figure below shows the approaches to Bukom Terminal (Blue line) and the **Abort point (Orange Demarcation line)**. Master to ensure that vessel is ready in all respect, tugs are made fast and maximum inward approach speed not to exceed **5.0 knots** when crossing the Orange Demarcation line.



ORANGE DEMARCATION line shows the Abort points before which incoming vessel shall ensure that they are fully ready and tugs are made fast before entering Bukom channel

BLUE LINE shows the various approach paths taken by vessels to Bukom Wharves

Max Berthing Speed – Detailed study has been conducted and it has been verified that the max allowable berthing velocity for Bukom wharves is in compliance / exceed the PIANC guidelines. PSA pilots are trained to adhere to the minimum PIANC guidelines whilst berthing vessel to wharves. Below table summarizes the minimum PIANC recommended design berthing velocity under favorable weather conditions which is applicable for Singapore.

Vessel displacement in tons	PIANC recommended design berthing velocity (meter/sec)
Under 10,000	0.2 – 0.16
10,000 – 50,000	0.12 – 0.08
50,000 – 100,000	0.08
Over 100,000	0.08

Anchorage – There are 30 designated anchorages in Singapore and depending on the vessel's condition of draft, cargo onboard, air draft, etc. MPA allocates the anchorage area to vessels. For more details on the anchorage please refer to Port Information Booklet, Admiralty Sailing Directions and Routeing Chart. Vessel's agents will keep them advised of the anchorage allocated to the vessel and make arrangements for the necessary port formalities.

Mooring Configuration – Please refer to detailed mooring arrangement plans detailed in the Section 15 of this booklet

10.03 MOORINGS

SLO is in charge and responsible for mooring operation and final mooring configuration of the vessel at the wharves. Pilot will be taking instruction from the SLO on the final mooring configuration of the vessel at the wharves. For larger vessels, there may be a tendency of head & stern mooring lines appearing to lead more in the direction of breast lines, however this is acceptable and mooring configurations used for vessels at all Bukom wharves are of approved design.

Surging of the ship is to be prevented and attention should be given to the movement of the ship caused by currents or tides and the cargo operation in progress. Moorings should be adjusted throughout the vessel's stay. The tidal range at springs is approximately 3.3 meters and current velocities can approach 3.0 knots. At Wharf 10, the west going current has a tendency to move the vessels off the jetty. It is therefore essential that wire ropes and fibre rope should not be used together in the same direction. Mooring lines of the same size and material must always be used for all leads in the same service and all moorings should be in good condition. The Master is responsible for ensuring that the ship remains securely moored throughout the stay alongside. The Master must ensure that all moorings are regularly tended and maintained in a taut condition.

In order to safeguard against injury to the mooring crew handling vessel's ropes / wires to the shore bollards, vessel should not start heaving until they receive a positive confirmation from the mooring crew that the line has been put / removed from the shore bollard / quick release hook. The mooring crew once clear from the shore bollard would signal the vessel to commence heaving by use of a whistle and marshalling baton. During master-pilot exchange the Pilot will again discuss this procedure with the Master to ensure compliance.

The minimum moorings required for vessel berthed alongside Bukom Wharves are as follows:

Vessels < 5,000 GT: 2 Head/Stern lines + 2 Spring lines

Vessels between 5,000 GT to 15,000 GT: 2 Head/Stern lines + 2 Breast lines + 2 Spring lines

Vessels between 15,000 GT to 50,000 GT: 3 Head/Stern lines + 2 Breast lines + 2 Spring lines, following applies only for wharf 10:

- 3 Head/Stern lines + 3 Breast lines + 2 Spring lines
- Vessels > 15,000 GT, the Spring lines shall be Wires or HMPE ropes with fitted tails.

For further information including position of fenders and mooring fittings please refer to mooring arrangements detailed in the Mooring Plans in Section 15.

As recommended by OCIMF we prefer to maximize the advantage in the use of breast lines over the use of head and stern lines. This practice will also further reduce the necessity to crisscross mooring lines of vessels berthed at adjacent wharves.

Ships fitted with automatic tension winches should not use winches on "Auto Mode" but manual winch brakes should be applied.

Loose moorings ropes must be made fast on bitts and not on warping drum and being attended to frequently.

10.04 EMERGENCY TOWING WIRES

Embracing the information paper and risk analysis by OCIMF, the terminal does not require rigging of emergency towing off pennants (Fire Wires) on the offshore bow and quarter. Vessel need to comply with port / flag state requirements if any.

10.05 DRAFT FOR BERTHING/UNBERTHING

For safety of navigation and in compliance to MARPOL Annex 1 Reg 18.2, all vessels are to maintain appropriate positive draft forward with appropriate trim and 100% propeller immersion when berthing or un-berthing. Vessel must at all times in compliance with its trim and stability condition.

PUMPING OVER TIDE IS NOT ALLOWED**10.06 GARBAGE**

No garbage, hot ashes or other hazardous materials nor shall any other objectionable materials, either solid or fluid, be thrown overboard or discharged from the vessel at Bukom. All bio-degradable garbage is to be stored in bins with tight-closing lids or wrapped up in tough plastic bags for disposal into garbage barge at the anchorage.

11. OPERATIONAL INFORMATION

11.01 PREVENTION OF POLLUTION OF THE SEA

We draw your attention to the following Government Regulations.

THE PREVENTION OF POLLUTION OF THE SEA ACT 1999 and Its subsidiary legislations.

THE MERCHANT SHIPPING (Civil Liability & Compensation for Oil Pollution) ACT 1999 and Its subsidiary legislation.

In the event of any spillage of oil from a vessel, irrespective of reasons or source, the Master and Owners shall be held responsible for all expenses involved in the cleaning up of such spillage.

11.02 ANCHOR LASHING

Vessel to ensure both anchors are securely lashed once the tugs are made fast upon approach towards berth. Master to inform the Pilot (for berthing at wharf) and SBM Duty Officer (for berthing at SBM) that anchors are secured and lashed. Master to ensure that anchor lashings are not to be removed throughout vessel's stay at the terminal.

11.03 PRE-TRANSFER CONFERENCE POLICY

Prior commencement of cargo transfer operations, Bukom SLO will board the vessel for information exchange between the terminal and ship. Ship/Shore safety checklist will be used during the conference; vessel's responsible officer for the cargo transfer operation and SLO is expected to exchange information on safety related and limitation on both vessel and terminal ensuring completion of safe and efficient cargo and ballast operations.

11.04 SHIP READINESS

The ship must be able to move under its own power at short notice. For dump barge a tug is required to stay alongside, it must remain completely clear from the cargo tank area of the barge (i.e. the part of the deck enclosed by the oil-spill containment plate).

Immobilization/major overhaul on vessels Main/Aux engines is NOT permitted during vessels stay at Bukom

Shipmaster and persons in charge of vessels should be mindful of sudden onset of gusty winds during a thunderstorm. The preparation should include putting the ships' engine on standby and prepare to stop cargo if necessary. Shipmasters can visit the National Environment Agency (NEA) website at http://www.weather.gov.sg/wip/web/home/further_outlook for the weather forecast and outlook in Singapore. Singapore Port Operations Control Centre is also promulgating the weather outlook regularly on VHF 09.

11.05 SHIP-SHORE SAFETY CHECKLIST

As part of the pre-cargo meeting onboard, all vessels berthing at Bukom cargo handling wharves are required to complete a ship-shore safety checklist prior starting cargo operation. Latest revision of ISGOTT should be referenced for the format and contents of the ship-shore safety checklist. Repetitive checks shall be conducted at 3 hours intervals or lesser if deemed appropriate on a risk-based approach. Repetitive checks will continue to be carried out even if cargo operations are complete and vessel stays alongside awaiting their turn to depart Bukom.

Vessel's officer / crew obliged to attend any safety related items as per the checklist upon highlighted by the Terminal representative during his rounds onboard.

11.06 MANNING REQUIREMENTS

Master to ensure the level of manning onboard the vessel is enough to manage Cargo transfer operations safely under continuous supervision. Vessels are to have on board at least one Senior Deck Officer (Master or Chief Officer) and one Senior Engineer (Chief or Second). In addition, enough Officers/crew should be retained onboard to manage with any security and emergency situations during the vessel's stay at the terminal. All personnel should be familiar with the dangers of the products handled. The handling of cargo must be supervised by a responsible ship's Officer. Ship's personnel must not be allowed to take charge of cargo operations or other tanker activities when they are in an intoxicated state or under the influence of drugs and alcohol. Details of manning level on the vessel and terminal should be discussed during the pre-transfer conference.

11.07 COMMUNICATIONS

Ship/shore communication in respect of cargo operations is primarily by a shore walkie-talkie on a dedicated frequency loaned to the ship during her stay alongside. Bukom Oil Movements Control Room will use the call sign "Movements Control". Secondary means of communication will be via VHF Channel 19. If communications by means of the walkie-talkie fails, then vessels should re-establish communication by calling "Bukom Operations" on VHF Channel 19.

The shore walkie-talkie has an emergency trip switch incorporated within it, and in which is linked to the shore loading pumps. In an emergency loading can be remotely tripped with this emergency trip switch function by turning the channel switch to No.16 and depressing the talk button.

It is essential that a listening watch on shore walkie-talkie and VHF Channel 19 is maintained throughout vessel's stay by the responsible Officer.

11.08 BALLASTING POLICY

In view Singapore's ratification to the 2004 International Convention for the Control and Management of Ship's Ballast Water and Sediment (BWMC) which entered into force in Port of Singapore on 08th September 2017 and in line with MPA of Singapore Shipping Circulars No. 08 of 2017 and No. 11 of 2017, Singapore registered ships and ships of 400 GT and above entitled to fly the flag of a party to the convention or operating under the authority of a Party to the Convention are required to carry on board:

- a) International Ballast Water Management Certificate (IBWMC);
- b) Ballast Water Management Plan (BWMP) approved by the Administration;
- c) Ballast Water Record Book (BWRB).

Ships operating solely within Singapore port limits need not comply with the above convention.

Clean ballast on board may be pumped overboard on the offshore side of the jetty. The taking of ballast into segregated ballast or cargo tanks should be discussed and agreed with terminal before commencement of pumping.

11.09 LOADING ARM/HOSE CONNECTION AND DISCONNECTION/DRAINING PROCEDURES

Terminal's mooring crew will connect / disconnect the cargo loading arms / hoses and vessel is to provide necessary assistance by means of ship's crew and equipment when connecting / disconnecting the loading arms / hoses to ship's manifold. Ship Master to ensure vessel's manifolds are in good operating conditions and the presentation of the manifolds are in line with OCIMF Recommendations for Oil and Chemical Tanker Manifolds and Associated Equipment. In the event vessel unable to comply with the recommendation, Master to highlight the same in his Pre-Berthing Questionnaire.

After completion of cargo transfer operation, vessel to seek permission from Movement Control Room to commence draining the manifold.

Loading arms/hoses must never be disconnected before it is emptied. Every effort to be made to ensure the disconnection being carried out carefully to avoid oil spillage.

Insulating Ship/Shore Connections- Insulated flanges are fitted on all shore loading hoses and loading arms and bonding wires are not to be used at Bukom wharves.

11.10 ENVIRONMENTAL CRITERIA FOR SUSPENDING OPERATIONS

Vessel is to monitor environmental conditions and following is the criteria for suspending operations:

	Suspend Cargo Operations	Disconnect Loading Arms/Hoses	Vessel depart Berth (if safe to do so)
Wind Speed	25kts	30kts	35kts
	Still Air Conditions		
	Electrical Storm		

Irrespective of measured wind speed, if either the ship's Master or the Terminal representative considers that the prevailing conditions potentially threaten the safety of operations, transfer should be suspended and loading arms/hoses disconnected.

During electrical storms, the handling of volatile petroleum, loading non-volatile petroleum into non-gas free tanks, ballasting into non-gas free tanks, inert gas purging, tank cleaning or gas-freeing after the discharge of such cargoes should be stopped and all tanks' openings and vent-line valves closed. Any visual sight of lightening in the vicinity must be immediately informed MCR. It is the joint responsibility of the vessel and terminal, whoever first sights presence of lightening, must call to stop cargo operations due to safety reasons. Stoppage of cargo operations may be initiated by either the vessel or MCR.

11.11 CARGO TRANSFER OPERATIONS

The ship/shore safety checklist will apply throughout the ship's stay alongside. All procedures in respect to the handling of cargo or of ballast, including precautions, should be established and agreed to during the pre-planning discussion. Any proposed changes or deviation to operational plan should be laid down in writing.

The initial and maximum loading rates, topping off rates should be agreed, having regard to:

- 1) The maximum allowable pressure and flow rate;
- 2) Avoiding accumulation of static electricity. If the static accumulation properties of the substance handled and the situation in the tank so requires, no conducting object (notably metallic sounding rods, sampling apparatus, steel ullage tapes and synthetic fibre ropes) should be inserted into that tank during loading and during a period of at least 30 minutes after the cessation of loading (applicable to non-inerted ships only). Synthetic fibre ropes should not be used with sampling cans or other sounding equipment.
- 3) The ship should advise the terminal at least 15 minutes before the final tanks to be topped off and request the loading rate to be reduced sufficiently to permit effective control of the flow on board.

In the case where the ship encounters difficulty with ship/shore walkie-talkie communication, the ship should use the VHF on channel 19 or activate the remote emergency shutdown device.

Precautions loading of HIGH VAPOUR PRESSURE CARGOES- You are reminded to refer ISGOTT 6th edition, sections 2.2 and 12.1.8 that details special precautions to be taken when handling such cargoes.

Precautions for DISCHARGING- You are reminded that the back pressure at the ship's cargo manifold should not exceed 10.0kg/cm² at any time throughout the discharge. In the event a serious leak is found on deck lines/manifolds, you should stop cargo discharge, close manifold valves and alert MCR immediately.

11.12 VAPOUR RECOVERY

Bukom Wharves are NOT fitted with vapour recovery control system except for LPG/C2 Vessels at wharves 11, 12 & 13.

11.13 DRY CERTIFICATES

Ships are advised that Terminal staff or their representatives will not sign any 'Dry Certificate' or other documentation attesting to the condition of ship's tanks on completion of discharge

11.14 FIRE FIGHTING EQUIPMENT

Fire-fighting equipment, fire hoses and extinguishers are to be positioned near the manifold. Fire main systems should be pressurised or be capable of being pressurised at short notice. Ensure that fire mains can be connected utilizing the international ship/shore connection.

11.15 SCUPPERS, DRIP TRAYS, UNUSED CONNECTIONS AND OVERBOARD DISCHARGE VALVES

All deck scuppers should be effectively plugged. Accumulation of water should be drained off periodically. Where LPG is being handled, the scupper may be kept open, provided that fire main pressure is available in the vicinity of the manifold.

The ship should be provided with fixed drip trays. Unused cargo and bunker manifolds must be blanked and fully bolted. Sea and overboard discharge valves when not in use should be closed and lashed. When lashing is not practical, as with hydraulic valves, some means of notable indication be used to ensure that the valves remained closed.

11.16 TANK HATCHES

Entry into any cargo tank, ballast tank, void space, and cofferdam is not permitted and tank hatches or any opening to remain securely closed.

11.17 TANK VENTING

Pressure/vacuum relief valves setting, and the associated vent system should be checked before operations. During cargo operations, the pressure/relieve valves or other approved venting system must be set in the Operational mode as specified in the manufacturer's manual. Ships carrying low flash cargo (Flash point less than 60°C closed cup method) and all vessels fitted with closed ullaging and an approved venting system are to practice closed loading / discharging unless otherwise agreed.

Where vessel is carrying / discharging cargo high in gaseous H₂S in the ullage space, inert gas system pressure in the cargo tanks should be adjusted to avoid venting tank vapour to the atmosphere. Please refer to section 7.16 for detailed precautions on H₂S.

Ship using inert gas must ensure that they follow their inert gas manual. If any part of the inert gas system should become defective, then cargo operations must be stopped immediately. Please refer to section 11.23 for detailed requirement on Inert Gas and the dangers of Pyrophoric Iron Sulphide.

11.18 TANK CLEANING

Tank cleaning, purging, gas freeing or inerting is not allowed alongside Bukom Wharves or SBM.

11.19 ELECTRICALLY OPERATED EQUIPMENT

Hand torches, portable UHF/VHF Walkie-Talkie, radiotelephone sets, hand phones, Cameras and other battery-powered equipment must be of an approved design or of an intrinsically safe type when used outside accommodation areas of the vessel. The ship's main radio transmitter can be used on Low Power mode. The main transmitting aerials must be disconnected and earthed. The ship's radar installation should not be used while alongside at wharves. The use of portable electrical equipment on wandering leads is prohibited. The use of hand phones and pagers outside accommodation areas onboard vessels or in the terminal is prohibited unless this equipment is intrinsically safe and approved by Bukom. All ship's visitors including agents, surveyors and superintendents with non-Bukom approved hand phones and pagers must surrender these at Bukom's security checkpoint prior to boarding the vessel at the berth. This equipment may be collected upon returning of the visitor's pass before departure from Bukom.

11.20 PREVENTION OF SPARKING AND EXCESSIVE FUNNEL SMOKING

Soot blowing is prohibited. Excessive funnel smoking or any sparking must be stopped immediately.

11.21 CONCURRENT BUNKERING

Ship's own use bunkers are not available ex-pipeline from the wharves; however, subject to prior approval from Bukom Marine Department, bunkers can be supplied through approved bunker barges for vessels alongside wharves and SBM except for LPG / C2 Vessels. Concurrent Bunkering is only permitted during daylight hours at Bukom Wharves. There are no daylight restrictions for vessels at SBM. Concurrent bunkering should not cause any delay to vessel operations of loading / discharging at the wharves and SBM.

Terminal reserves the right to cancel / stop bunkering operations. Any non-compliance to terminal requirements can lead to the receiving vessel and bunker barge to be ordered to vacate berth, any delay thereof will not be for terminal account.

Master is solely responsible for the safe conduct of concurrent bunkering operations whilst alongside Bukom wharves and SBM including conduct of the bunker barge as per ISGOTT 6th Edition.

During concurrent bunkering operations alongside Bukom wharves and SBM, shore leave is not permitted, and sufficient crew is to be available onboard. Bunkering operations is to be supervised by an officer other than the one responsible for cargo operations. Crane operator should have adequate experience and training; lifting operations is to be supervised by a qualified Officer. Prior operation of crane, permission is to be sought from "MCR" and slewing of crane is only permitted on the offshore side and never over the hoses / cargo arms. Masters of both the Vessel and the Bunker barge to ensure safe access and SOLAS approved Lifejacket/PFD to be used by all personnel transferring between the receiving vessel and bunker barge. It is an exquisite requirement that sailing of bunker barge should not be delayed for whatsoever reason including quantity disputes. Quantity disputes if any should be resolved post cargo operations after shifting to an anchorage area.

For any emergency between the vessel and bunker barge, please cease bunkering operation and inform "MCR" Receiving vessel is responsible to keep "MCR" advised of tentative finishing times of bunkering operations and sailing time of bunker barge.

11.22 SLOPS AND DIRTY BALLAST

Shore facilities are available for Slops/Dirty Ballast on request, subject to approval from Terminal, however to a maximum of 400 metric tons. A fee of S\$5,000 is charged for each Slops/Dirty Ballast discharge to Bukom. Vessel must declare type and nature of oil/water of the Slops/Dirty Ballast and the quantity of Oil/Water in m³. Slops/Dirty Ballast shall be free of Chemicals, Organic Chloride and Engine Room Slops. Receipt of Slops/Dirty Ballast is conditional upon availability of shore ullage and vessel's acceptance to all provisions as stipulated in the "DISCHARGE OF SLOPS" Form. Receipts of Slops/Dirty Ballast are subject to a satisfactory sample testing and time spent for testing will not be for terminal's account and terminal has the right to reject/decline the Slops/Dirty Ballast if it does not meet the requirement. Discharge of Slops/Dirty Ballast must be carried out under inerted conditions if the nature of slops is ex-previous cargo crude or volatile products. Flushing, cleaning or man-entry is **NOT ALLOWED** after completion discharge of Slops/Dirty Ballast. Pumping and draining of slops into the Terminal's manifold drip pit is not allowed. Discharge of volatile slops at Wharves 11 and 13 is not allowed.

11.23 INERT GAS

- a) Vessel fitted with inert gas system should comply with Safety of Life at Sea Convention (SOLAS) 1974 as amended and before berthing Bukom should inert cargo tanks as required.
- b) Vessels that are not fitted with IGS, will continue to be permitted to load volatile cargoes (flash point below 60 Deg. C close cup). However, must ensure ISGOTT guidelines are complied with in full and that vessel should be loading under closed loading system.

INERT GAS OPERATION AND PYROPHORIC IRON SULPHIDE

Pyrophoric iron sulphide is a recognised source of ignition in the petroleum industry. Three elements in the formation of pyrophoric iron sulphide are:

- the presence of iron oxide (rust);
- a crude oil which emits hydrogen sulphide concentrations into the cargo tank ullage space;
- a lack of oxygen in the ullage space.

Pyrophoric iron sulphide can heat to incandescence when it comes into contact with air and is capable of igniting-flammable hydrocarbon/air mixture. The initial reduction of the oxygen level in ullage space of cargo tanks brought about by the operation of inert gas systems, combined with further absorption of oxygen by the crude oil, may promote the formation of pyrophoric iron sulphide.

In the normal operation of inerted tankers the cargo tank atmosphere is not allowed to become flammable at any time. Thus, the presence of any pyrophoric deposits would not result in ignition.

However, if the inert gas plant were to fail, cargo or ballast discharge would cause air to enter the cargo tanks and result in a flammable atmosphere that could be ignited by pyrophoric deposits if present.

Against this background (and following research work undertaken by major oil companies), the Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS) recommend the following precautions for crude oil tankers with inert gas systems:

- (a) Diligent maintenance of inert gas plants should be stressed.
- (b) Spares should be kept on hand for critical parts which cannot be obtained quickly, or which can fail abruptly, such as the blower.

(c) In the event of inert gas plant failure prior to or during cargo or ballast discharge, Terminal must be informed immediately, and discharge should not commence or continue until the inert gas plant operation is restored or an alternative source of inert gas is provided.

Vessels fitted with an inert gas system should maintain cargo tanks in an inert condition when carrying all crude oils and when carrying products whose flash point is less than 60°C.

11.24 CRUDE OIL WASH OPERATIONS

Ship must maintain a constant pollution-prevention patrol while COW. is in progress.

The discharge plan should include the discharge of free water plus one-meter de-bottoming of all tanks from which crude feed for COW. is to be taken.

All component parts of the inert gas system must be operational including alarm system, analysers, indicators and recorders.

Vessel must have available a crude oil washing Operations and Equipment Manual approved by the flag state administration.

The Master/Chief Officer in charge of crude oil wash operations must either:

- a) hold a certificate of competency for crude oil wash issued by the ship's flag state administration; OR
- b) be able to prove at least one year's experience on oil tankers where his duties have included the discharge of cargo and associated crude oil washing. Where his duties have not included crude oil washing operations, he shall have completed a training programme in crude oil washing in accordance with Appendix II to the Revised Specifications for the Design, Operations and Control of Crude Oil Washing System, AND he must have participated at least twice in crude oil washing programme, one of which shall be on the particular ship for which he is required to undertake the responsibility of cargo discharge. Alternatively, this latter participation may be acceptable on a ship that is similar in all relevant aspects, AND he must be fully knowledgeable of the contents of the COW. Operations and Equipment Manual.

Any other persons having responsibilities as defined in the Operations and Equipment Manual must prove he has at least 6 months experience on oil tankers and in the course of his duties has been involved with cargo discharge operations. He must also have been instructed in operations on this particular ship.

We wish to draw your attention to the guidelines issued by the Energy Institute on Crude Oil Washing, latest edition of HM 40. In order to reduce cargo loss through vaporization and VOC emission into the atmosphere, you are hereby advised to minimise COW whilst discharging at our terminal. The minimum number of cargo tanks to COW is to comply with MARPOL and/or flag state requirements only and COW of any additional tanks to be avoided. To minimise cargo retention on board you are advised to maintain maximum safe stern trim and list vessel if required during draining and all tanks to be stripped at least twice or three times if time permits.

11.25 TESTING OF BUNKER TANKS

The International Maritime Organisation has recently expressed concern over the number of occasions where tankers have been found with bunker tanks containing substantial quantities of crude oil or other volatile materials added to the fuel oil.

The addition of these substances has produced bunkers with flash points below the 60°C required by the SOLAS Convention and resulting to ullage space atmospheres near to or within the flammable range.

In order to protect our terminal, we may require, as part of the pre-cargo operation ship/shore checking, to test the atmosphere of some or all of your bunker tank ullage spaces. Should a reading of 50% LEL be exceeded, we will collect samples of the oil contained in the tank for laboratory determination of flash point. In the event that this analysis shows the oil to have flash point below 60°C, all cargo operations will be suspended, and the vessel may be ordered to vacate the berth until measures have been taken to ensure bunker tank contain only bunkers with an acceptable flash point. All costs incurred will be for your Owner's account. The Port Authority will be advised of our findings in order that they may take whatever action they consider necessary.

11.26 CARGO SURVEYORS / SAMPLING, GAUGING and CARGO FIGURES

Vessels are subjected to un-announced inspections to prevent malpractices. Shell Bukom works closely with Singapore law enforcement authorities to report any potential illegal activity occurring on vessels.

Cargo Surveyors are required to accurately gauge and maintain records of all cargo tanks including non-nominated tanks and other compartments, prior and after completion of cargo transfer operation. Master shall allow surveyors to carry out the inspection of all cargo tanks and other compartments. **Master shall allow surveyors to use their own calibrated gauging equipment with proper fitting and connection to the respective cargo tank vapour lock. Final cargo quantification will be based on the surveyor's gauging equipment.** In the event surveyor's equipment is deemed incompatible with ships' vapour connection, subject to positive comparison between vessel's & surveyor's gauging equipment and valid shore inspection and calibration certificate of the equipment, vessel may use their own equipment for gauging and calculation.

Refer appendix 4 (**CARGO SURVEYOR EQUIPMENT MANAGEMENT ON SHIPS**). Gauging and Sampling shall be carried in a closed loop system.

All final Bill of Lading figures will be closed on shore measurements unless advised otherwise by the Terminal.

11.27 POTABLE WATER

Fresh water supply for vessel is not available at the terminal. Master to arrange through agent for fresh water supply at anchorage.

12. RESPONSIBILITIES

As stated in the Safety Letter, responsibility for the safe conduct of operations whilst the ship is at the Pulau Bukom Terminal rests jointly with the Master of the ship and with the responsible Terminal Representative.

Emphasis is placed on the fact that the completion of a safe and successful cargo transfer operation is dependent upon effective Co-operation, Co-ordination and Communication between all parties involved. All operations should be conducted in the spirit of this mutual agreement.

12.01 JURISDICTION

The Pulau Bukom Terminal is within the jurisdiction of the Maritime Port Authority, Singapore and officers may board arriving ships at random to undertake safety and anti-pollution inspections.

12.02 CONDITIONS OF SHIP ACCEPTANCE

Ships are accepted at the Pulau Bukom Terminal on the understanding that operations will be conducted in accordance with all applicable legislation, together with practices contained in relevant Codes of Practice, in particular, the guidance contained within the latest edition of the International Safety Guide for Oil Tankers and Terminals (ISGOTT). Ships found deficient on arrival may be subject to refusal until the deficiencies have been rectified.

12.03 RESPONSIBILITY FOR LOADING

Ship's personnel are advised that responsibility for the loading operation on board the ship rests solely and absolutely with the Master. It is the responsibility of the ship's personnel to operate valves and to ensure safe and secure connection of all transfer equipment to the ship's manifold.

Ship's personnel are advised that the responsibility for the discharge or escape of oil from a vessel rests with the ship. In the event of a prosecution being taken by the appropriate authorities, heavy penalties together with liability for dispersal costs and damages for pollution damage, is provided for by legislation.

12.04 RESPONSIBILITY FOR UNLOADING

Ship's personnel are advised that responsibility for the unloading operation on board the ship rests solely and absolutely with the Master. It is the responsibility of the ship's personnel to control pumping rates, to operate valves and to ensure safe and secure connection of all transfer equipment to the ship's manifold. Ship's personnel are advised that responsibility for the discharge or escape of oil from a vessel rests with the ship. In the event of a prosecution being taken by the appropriate authorities, heavy penalties together with liability for dispersal costs and damages for pollution damage, is provided for by legislation.

13. ADDITIONAL CHECKS - BULK LIQUID CHEMICALS

All chemical tankers should have a copy of the following publications:

- 1) ICS: Tanker Safety Guide (Chemicals)

3) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC).

Information and cargo operations on the product to be handled should be available on board the ship and shore before and during the operation. This information should include:

- a cargo stowage plan;
- a full description of the physical and chemical properties, including reactivity, necessary for the safe containment of the cargo;
- action to be taken in the event of spills or leaks;
- counter measures against accidental personal contact;
- fire-fighting procedures and fire-fighting medium;
- procedures for cargo transfer.

When cargoes that require to be stabilised or inhibited are to be handled, information should be exchanged thereon.

Personnel who are required to use breathing apparatus during operations should be physically fit and trained in its safe use. Unfit or untrained personnel should not be selected for operations involving the use of breathing apparatus.

Sufficient and suitable means should be available to neutralise the effects and remove small quantities of spilled products. A suitable safety shower and eye rinsing equipment should be fitted and ready for immediate use in vicinity of places on board where operations regularly take place.

When automatic shutdown valves are used, the cargo handling rate should be so adjusted that a pressure surge evolving from the automatic closure of any such valve does not exceed the safe working pressure of either the ship or shore pipeline system. Alternatively, means may be fitted to relieve the pressure surge created, such as re-circulation systems and buffer tanks.

Cargo system gauges and alarms should be regularly checked to ensure they are in good working order.

Suitable equipment should be available for measuring flammability. Calibration should be carried out before the operation commences.

Open draining of static accumulating chemical cargoes into plastic drums is not allowed.

Special attention should be given to any products that are being handled which may be water reactive or require specialised fire-fighting procedures.

Hoses should be indelibly marked so as to allow the identification of the products for which it is suitable, its specified maximum working pressure, the test pressure (including the last date on which it was tested at this pressure), and if used at service temperatures other than ambient, its maximum and/or minimum service temperature.

The use of non-permanent equipment inside tanks is not permitted. The electrical discontinuity of the ship and shore pipelines should be checked. Whenever cargo hoses are used to make connections within the ship or shore permanent pipeline system, these connections should be well secured, kept as short as possible and made electrically discontinuous to the ship or shoreline system respectively.

14. BULK LIQUEFIED GASES

All LPG tankers should have a copy of the following publications:

- 1) ICS: Tanker Safety Guide (Liquefied Gases).
- 2) IMO: Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk; or
- 3) IMO: Code for Existing Ships Carrying Liquefied Gases in Bulk.
- 4) IMO & ICS: Ship-to-Ship Transfer Guide (Liquefied Gases).
- 5) OCIMF: Liquefied Gas Handling Principles on Ships and in Terminals (SIGTTO)

Information on the product to be handled should be available on board the ship and shore: -

- a) a description of the physical and chemical properties necessary for the safe containment of the cargo;
- b) action to be taken in the event of vapour release or leaks;
- c) counter measures against accidental personal contact;
- d) fire-fighting procedures and fire-fighting medium;
- e) minimum cargo containment system and temperature.

Personnel who are required to use breathing apparatus during operations should be physically fit and trained in its safe use.

In case where cargo tanks are permitted to have more than one relief valve setting, it should be verified that the relief valve is set as required by the cargo to be handled and that the actual setting of the relief valve is clearly marked and visibly displayed onboard the ship.

Span gas should be available to enable calibration of gas detection equipment. Fixed gas detection equipment should be calibrated for the product to be handled prior to commencement of operations. Portable gas detection instruments, suitable for the products handled, capable of measuring flammable and/or toxic level, should be available and calibrated for the product handled.

Cargo system gauges should be regularly checked to ensure that they are in good working order. The system alarm should be set to the required level.

Ship/shore emergency shutdown systems (SIGTTO) should be tested prior cargo transfer operation.

The safe cargo-handling rate should be noted.

If a leak occurs from a pipeline the de-pressurising caused by the leak and the consequential cooling may cause the metal of the pipe to be lowered below its safe pressure/temperature equilibrium. In the event that this happens, the line must be allowed to "warm up". To prevent the lines cooling below freezing point, vessels are required to have the sprinkler system immediately available for operation throughout loading and two fire hoses should be connected to the fire line so they can be sprayed on any leakage.

Fully pressurised vessels arriving from dry dock with their cargo tanks N₂ purged, the tank atmosphere composition must be less than 0.5 percent O₂ and at least a minimum N₂ pressure of 3.0kg/cm to avoid sudden "boiling" effect during initial loading. This must be certified by a recognised surveying Company.

15. APPENDICES

APPENDIX 1 – SIRE REQUEST FORM



Shell Eastern Petroleum Pte Ltd

To: Marine Department Pulau Bukom, Singapore
Attn: Duty Marine Officer

Request Submission Date: _____

CONDITIONS FOR CARRYING OUT SHIP INSPECTION / VISIT AT BUKOM

1. The inspector / visitor should ensure that all **Non-Intrinsically Safe Devices** (example: cameras, mobile phones, smart watches, fitness wrist bands, torches, etc.) are powered off when boarding the vessel. These devices can only be switched on when inside safe zone onboard the vessel i.e. in the accommodation space only. When doing inspection of any area other than the accommodation space these **Non-Intrinsically Safe Devices** should not be carried with him. The inspector/visitor should be clad in appropriate **Personal Protective Equipment**, which should be adequate for the purpose.
2. The inspection/visit should only be carried out with the full knowledge of the ship's Master. Boarding the vessel from seaside is permitted at all wharves except for LPG/ C2 vessels berthed at wharf 11, 12 and 13 where due to minimum exclusion zone requirements all boarding and disembarking is to be carried out at anchorage and no deviation is permitted to this requirement. The inspector/visitor should obtain the necessary **MPA security clearance** and before boarding should register himself as a visitor with the **Bukom Police at East Gate Jetty**.
3. While on board, the inspector/visitor is to be **accompanied at all times** by a responsible person nominated by the Master. The nominees should not be the officer on duty nor a crewmember attending to cargo operations at the time.
4. The inspector/visitor should be an observer only and **should not interfere or become involved** in the operations of the ship nor be a party to ship/shore discussions.
5. The inspection/visit should not be conducted in such a manner as to **endanger the ship or terminal**, nor affect the **operational efficiency** of the vessel during loading/discharging of cargo. He should not interfere with the **work/ rest schedule** of personnel onboard and ensure that his actions/ requests does not cause vessel to violate mandatory STCW requirements.
6. The inspector/visitor is **NOT** allowed to enter any **confined spaces, void spaces, cargo or ballast tanks** during the course of the inspection/visit while alongside. Any inspection of internal space from deck level will be subjected to approval on case to case basis. **No climbing aloft** where there is a risk of falling from heights.
7. Only **ONE** inspection/visit is allowed during the vessel's entire schedule of cargo operations alongside Bukom wharves.
8. Only **SIRE** inspection carried out on behalf of Major Oil Companies are permitted.
9. We would appreciate if any deficiencies, which in the SIRE Inspector's opinion, are found **affecting the operational safety of the vessel/ terminal** be reported to Bukom Duty Marine Officer promptly on Tel: 8163 4027.
10. A copy of this inspection/visit condition is to be **duly signed and stamped by Ship's Master** prior to the inspection/visit for compliance. The inspector/visitor should email the completely filled and signed copy, together with the appointment message from the oil major company which they are representing if it is a SIRE inspection request, to Bukom Marine at the time of requesting permission.
11. The inspector/visitor boarding the vessel at the terminal does so at his own risk and agrees to **indemnify Shell Bukom** from all claims, losses, damages or personal injury howsoever caused.
12. SIRE Inspection should be carried out during **DAYLIGHT** hours only.

I hereby agree to observe and comply with the above listed conditions.

Wharf No: _____ Inspection Date Range: _____ Vessel: _____

Signature of Inspector / Visitor

Signature & Stamp of Master

Name of Inspector / Visitor: _____

Name of Company: _____

Address: _____

Tel No: _____

Email: _____



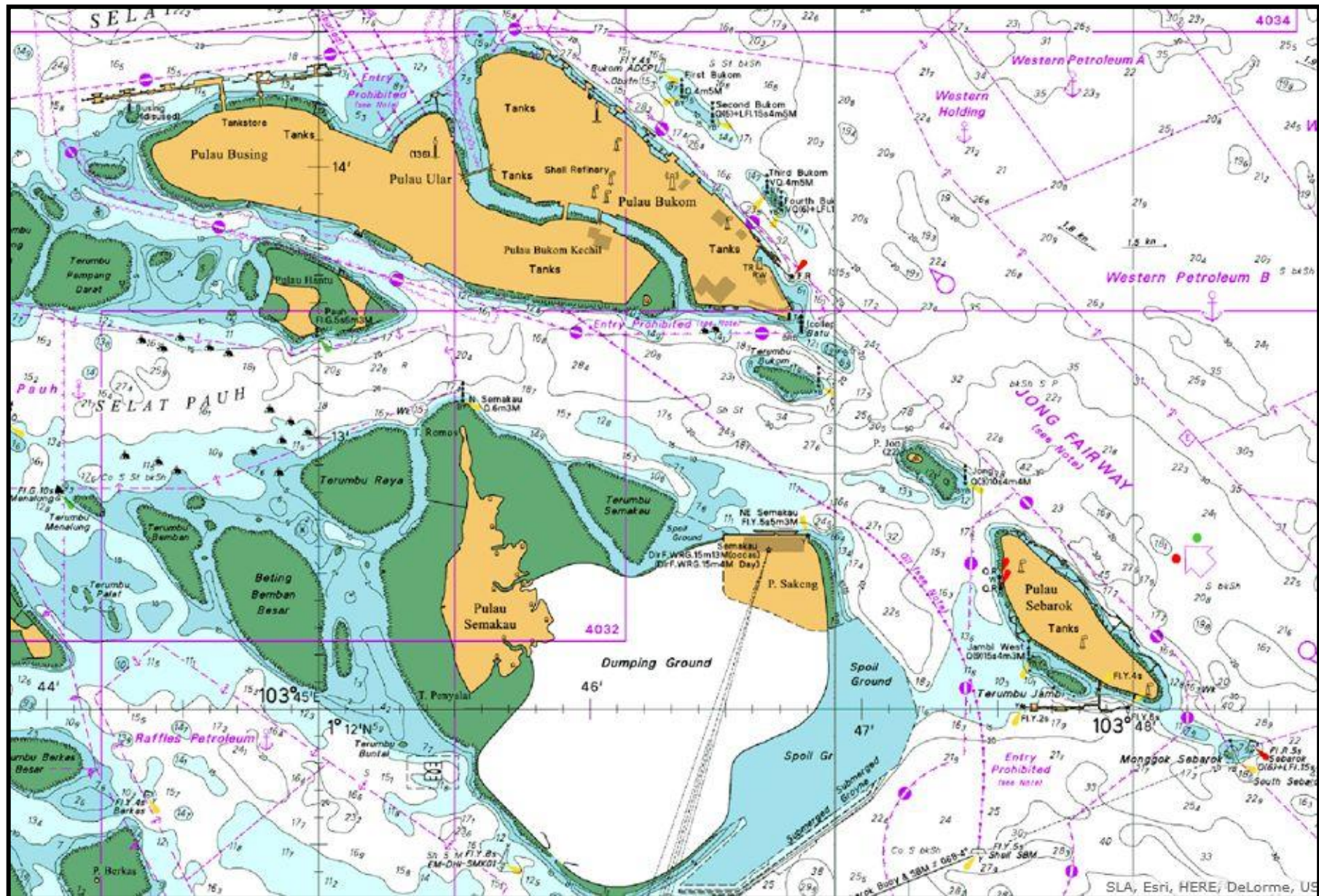
Shell Eastern Petroleum Pte Ltd

PROCEDURE FOR REQUESTING CLEARANCE TO CARRY OUT SHIP INSPECTION / VISIT AT BUKOM

In line with SEPL HSSE Policy, requestors **MUST** observe and comply with the following in their inspection / visit request submission:

1. In order not to overlook any requests, all requests **MUST** be directed to the email address as follows: **SEPLOP-Marine-Clearance@shell.com**. **DO NOT** send copies of the message to individual mailboxes of Bukom Marine Personnel. Requests sent to individual mailbox will not be processed.
2. All information required in the "Conditions for Carrying Out Ship Inspection/Visit at Bukom **MUST** be duly filled and signed by the attending inspector/visitor and Master of the vessel prior submission. Any change of attending inspector/visitor, the earlier approval granted/said request submitted will be considered void and a new inspection/visit request is to be submitted. Incomplete form or request without supporting document as required will not be processed.
3. All SIRE inspection request submissions **MUST** be accompanied with the appointment message from the oil major company which they are representing.
4. The date for inspection/visit could be applied for a maximum of **5 days range**. A fresh inspection/visit request is to be submitted if the actual inspection/visit date is falling out from the requested date range.
5. Failure to comply with the above procedures may result in delays in granting permission for the inspection/visit.
6. Any non-compliance with the stated conditions for carrying out inspection/visit may result in future inspection/visit request arising from the same company not being granted.

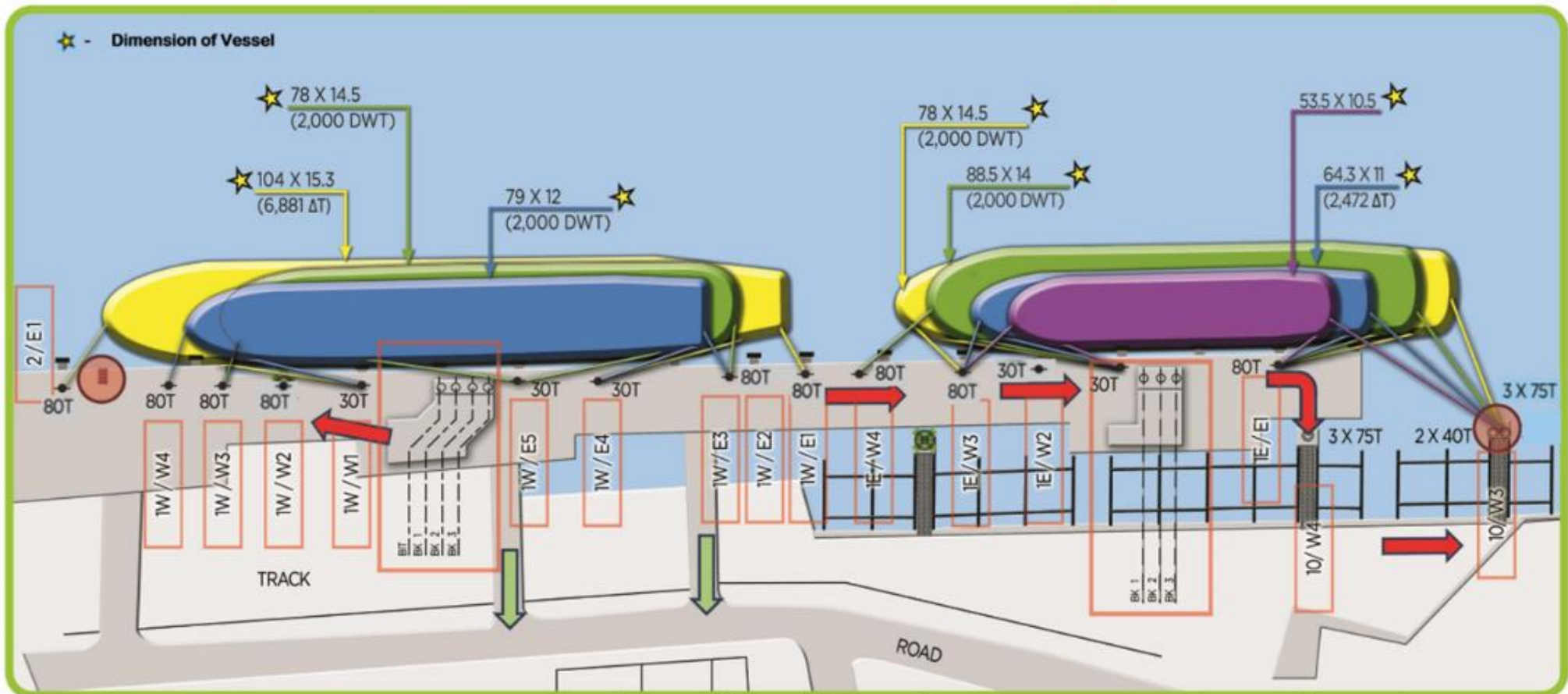
APPENDIX 2 – PLAN OF PORT LAYOUT



APPENDIX 3 – MOORING PLAN AND BERTH LAYOUT



BUKOM WHARF 1E/1W - MOORING LAYOUT



★	BOLLARDS
●	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
TW	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING ARM

WHARF 1W	○	○	○	○
MLA	BTB	BK1	BK2	BK3
CARGO	BITUMEN	-	-	-
CONNECTION SIZE	8"	8"	8"	6"

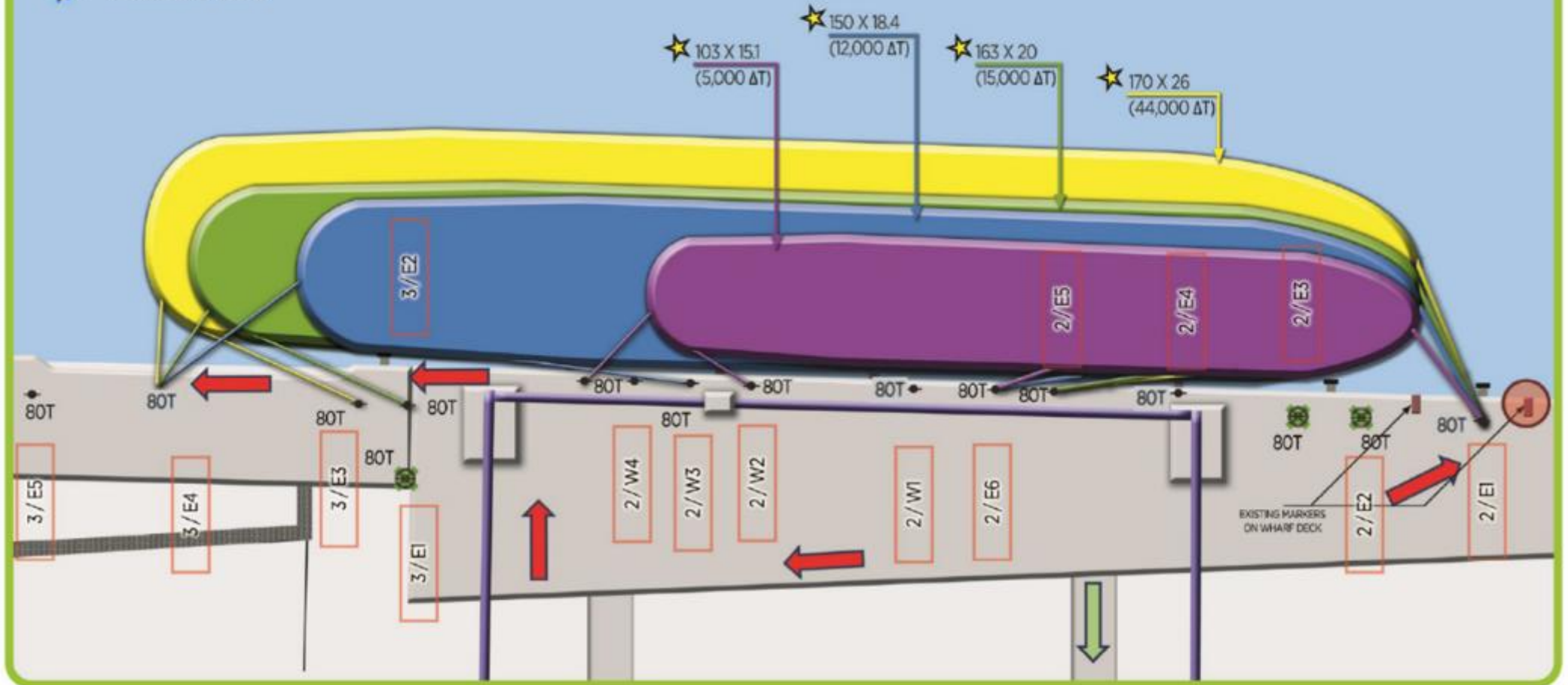
WHARF 1E	○	○	○
MLA	BK1	BK2	BK3
CARGO	-	-	GASOIL
CONNECTION SIZE	8"	8"	6"



BUKOM WHARF 2 - MOORING LAYOUT



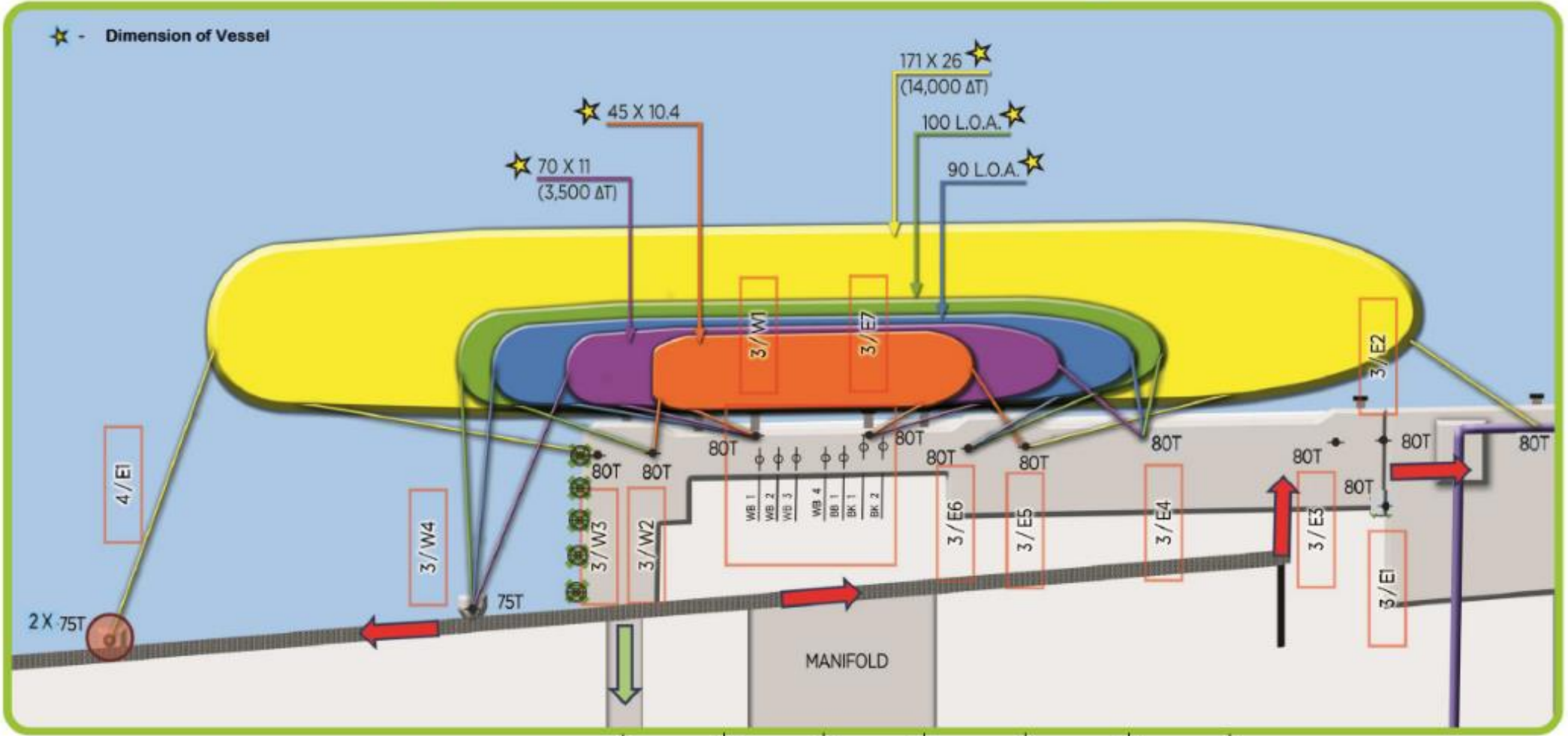
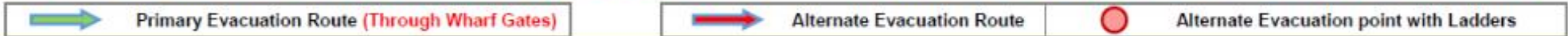
★ - Dimension of Vessel



★	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
□	MOORING POINT IDENTIFICATION
⊥	FENDERS
○	LOADING ARM



BUKOM WHARF 3 - MOORING LAYOUT

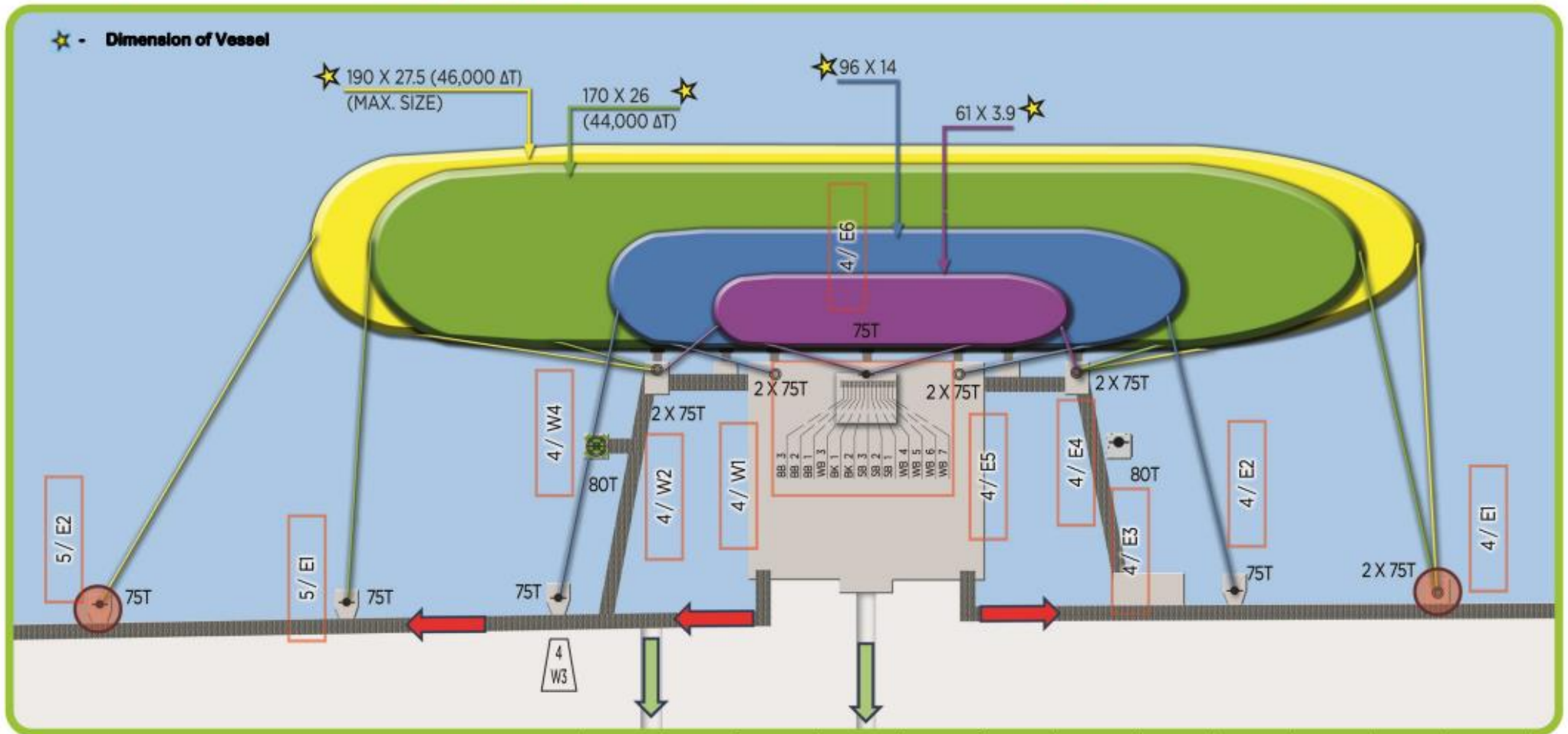
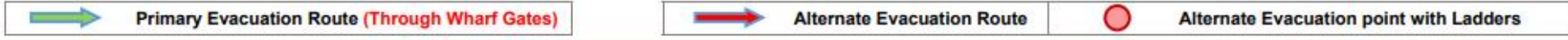


●	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
□	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING ARM

MLA	WB1	BB1	WB2	WB4	WB3	BK1	BK2
CARGO	MOGAS	GASOIL	MOGAS	FUELOIL	JET	-	-
CONNECTION SIZE	12"	12"	12"	12"	12"	8"	8"



BUKOM WHARF 4 - MOORING LAYOUT



●	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
⊠	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING HOSE

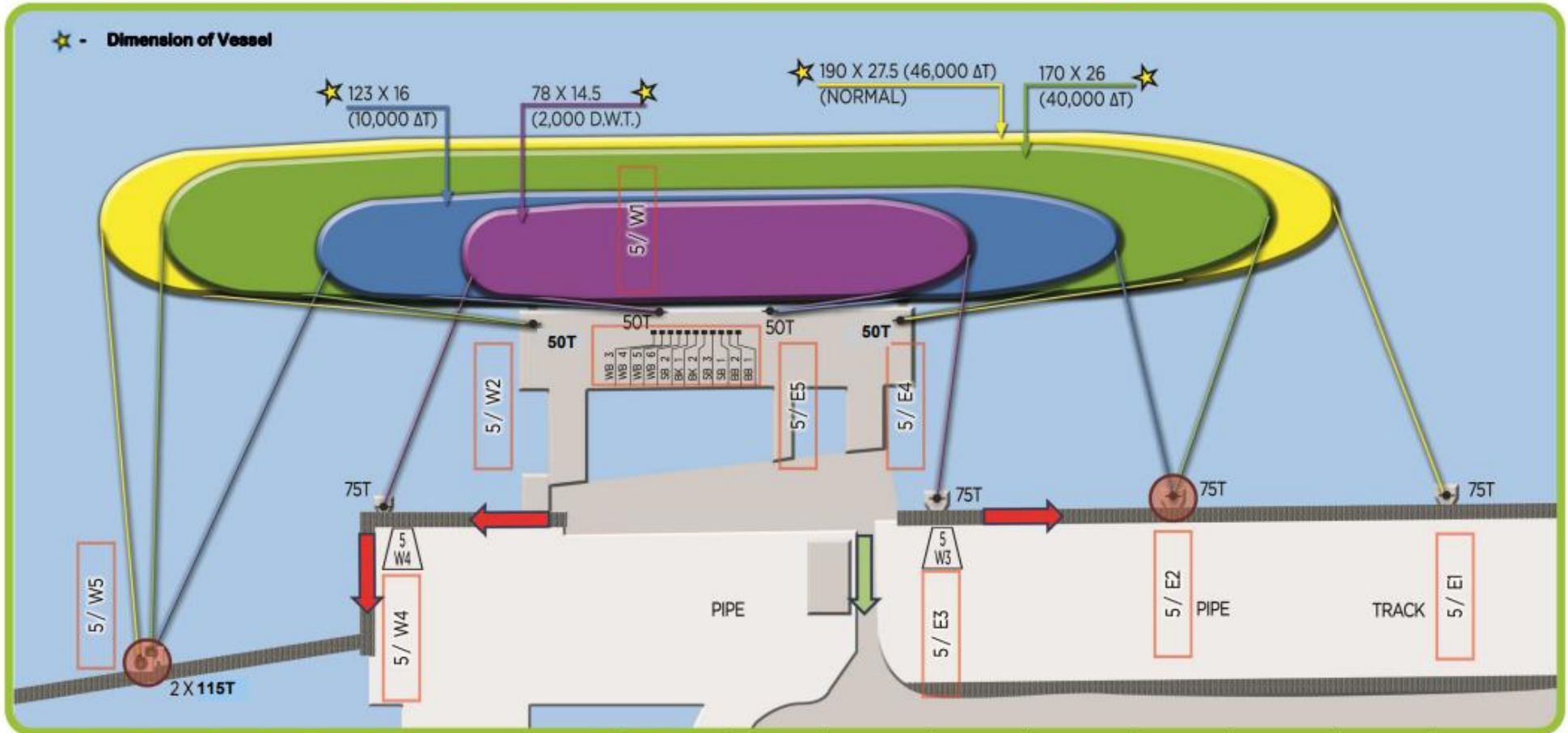
MLH	BB3	BB2	BB1	WB3	SB4	SB5	SB3	SB2	SB1	SB6	WB5	WB6	WB7
CARGO	GASOIL	LSGO	HSFO LSFO	JET	-	-	-	-	-	CAUSTIC	MOGAS	MOGAS NAPHTHA	MOGAS NAPHTHA
CONNECTION SIZE	10"	10"	10"	10"	-	-	-	-	-	4"	10"	10"	10"



BUKOM WHARF 5 - MOORING LAYOUT



★ - Dimension of Vessel

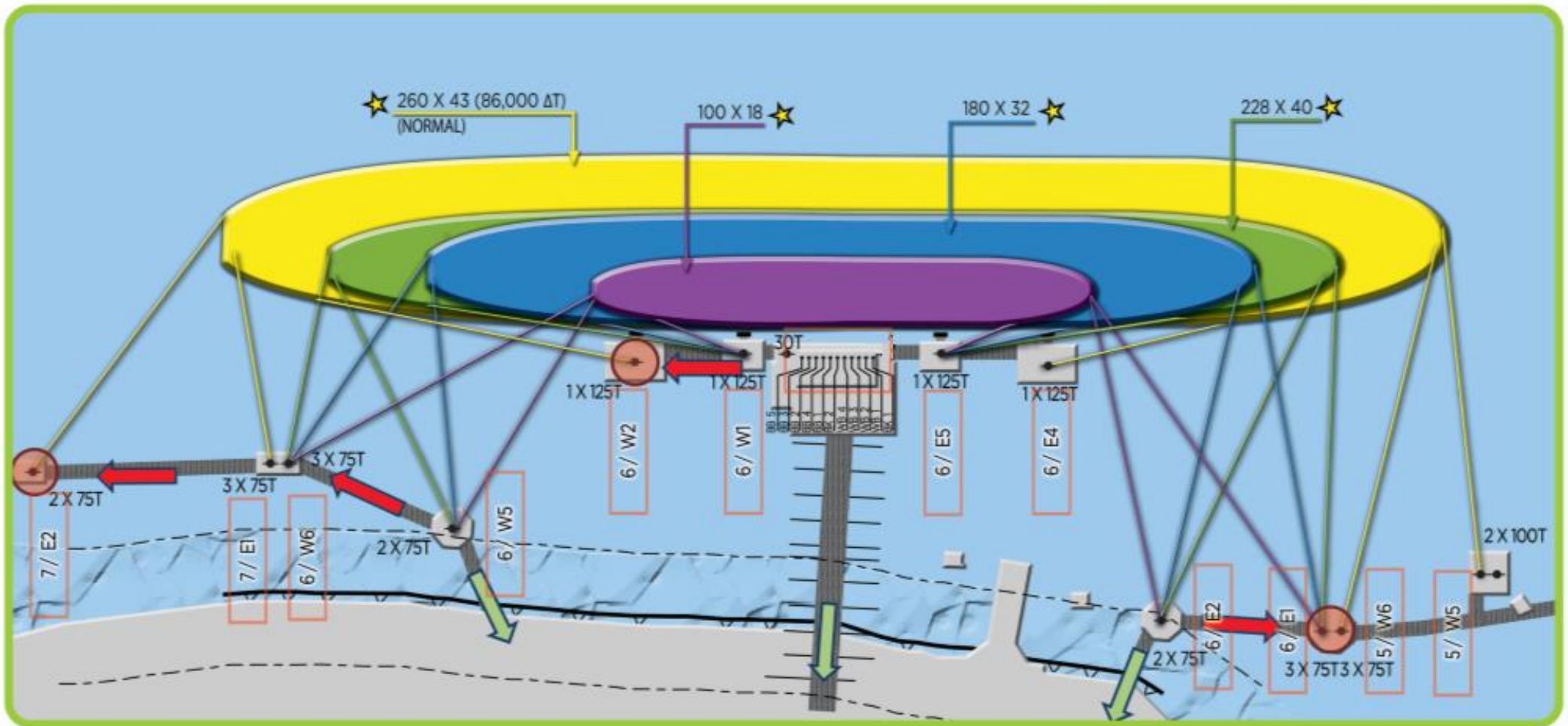
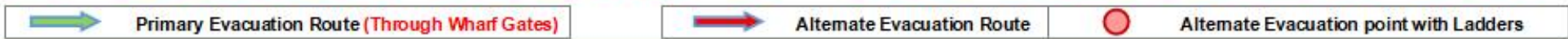


●	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
5/W1	MOORING POINT IDENTIFICATION
TY	FENDERS
○	LOADING HOSE

MLH	WB3	WB4	WB5	BB3	SB2	SB4	SB1	BB2	BB1
CARGO	MOGAS NAPHTHA	MOGAS	JET	LSGO	-	CAUSTIC	-	LSGO	GASOIL
CONNECTION SIZE	10"	10"	10"	10"	-	4"	-	10"	10"



BUKOM WHARF 6 - MOORING LAYOUT



★	BOLLARDS
○	QUICK RELEASE HOOK S
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOK S
□	MOORING POINT IDENTIFICATION
—	FENDER S
○	LOADING HOSE

	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
MLH	BB5	BB3	BB2	BB4	BB1	BB6	WB4	WB3	WB2	WB1
CARGO	CRUDE LSFO	CRUDE LSFO	CRUDE LSFO	GASOIL LSGO	GASOIL LSGO	LSGO	NAPHTHA	NAPHTHA	JET	JET
CONNECTION SIZE	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"



BUKOM WHARF 7 - MOORING LAYOUT

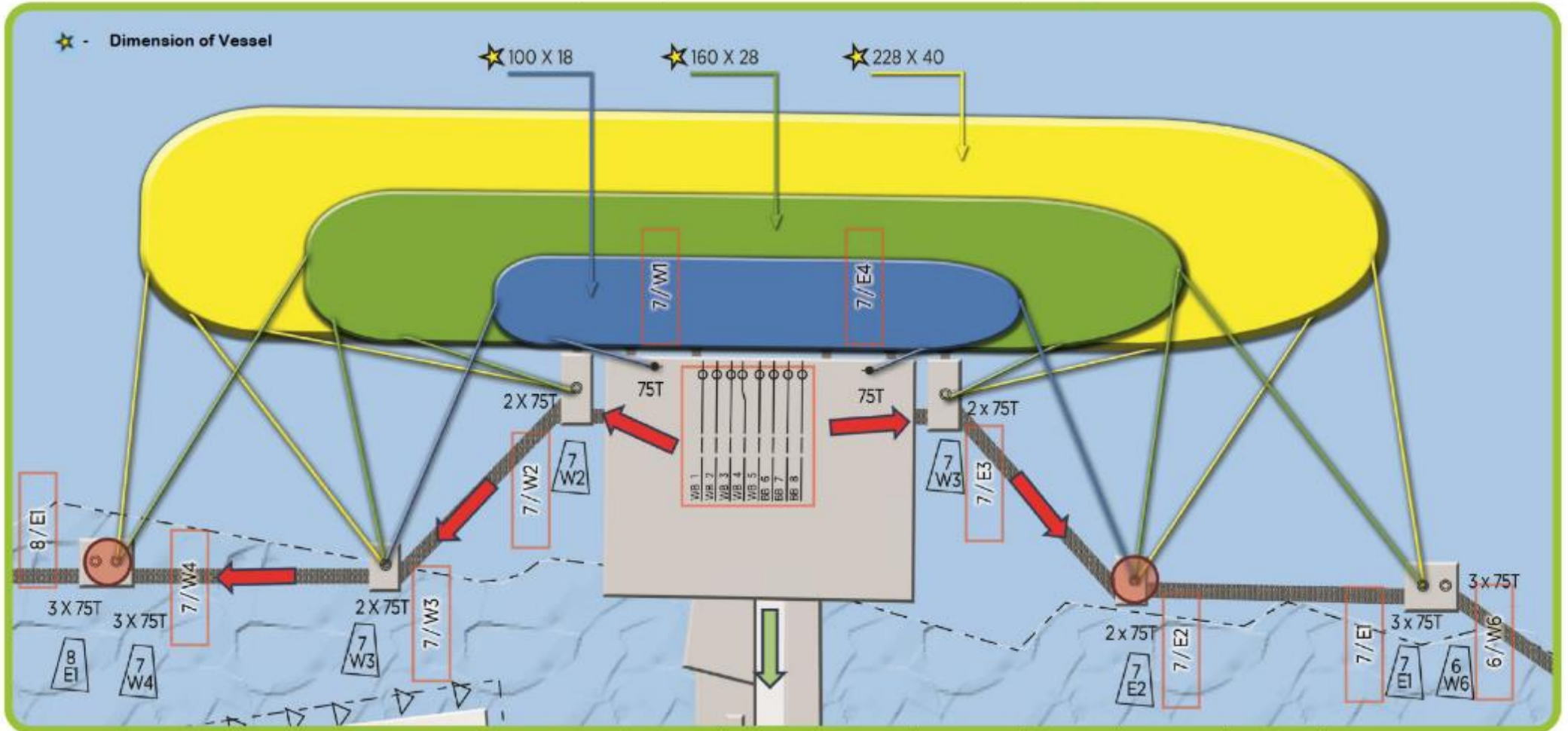


★ - Dimension of Vessel

★ 100 X 18

★ 160 X 28

★ 228 X 40



●	BOLLARDS
⊗	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
★	MOORING POINT IDENTIFICATION
⚓	FENDERS
○	LOADING ARM

MLA	WB1	WB2	WB3	WB4	WB5	BB6	BB7	BB8
CARGO	MOGAS	JET	LSGO	MOGAS	JET	GASOIL LSGO	GASOIL LSGO	CRUDE
CONNECTION SIZE	10"	10"	10"	10"	10"	12"	12"	12"



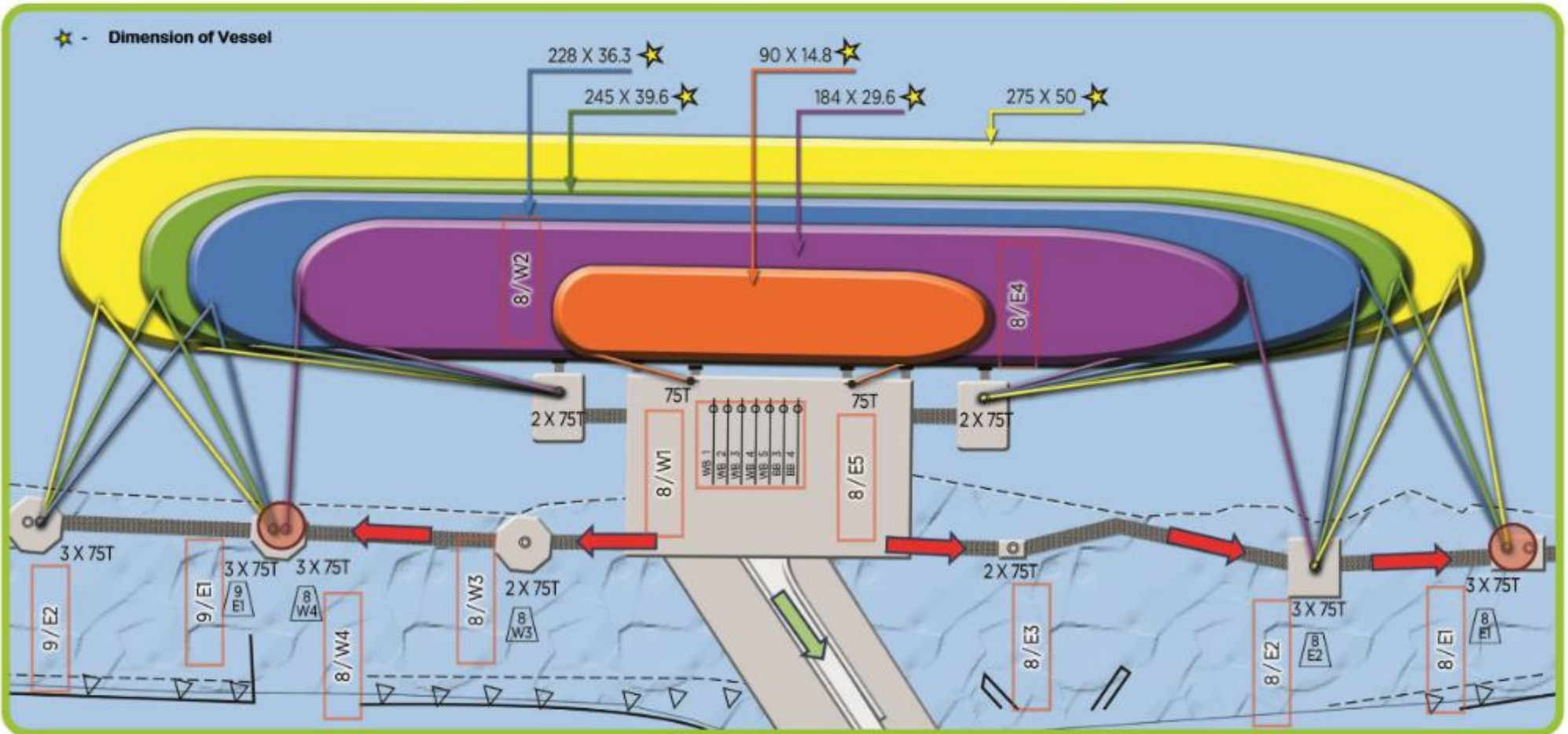
BUKOM WHARF 8 - MOORING LAYOUT

→ Primary Evacuation Route (Through Wharf Gates)

→ Alternate Evacuation Route

○ Alternate Evacuation point with Ladders

★ - Dimension of Vessel

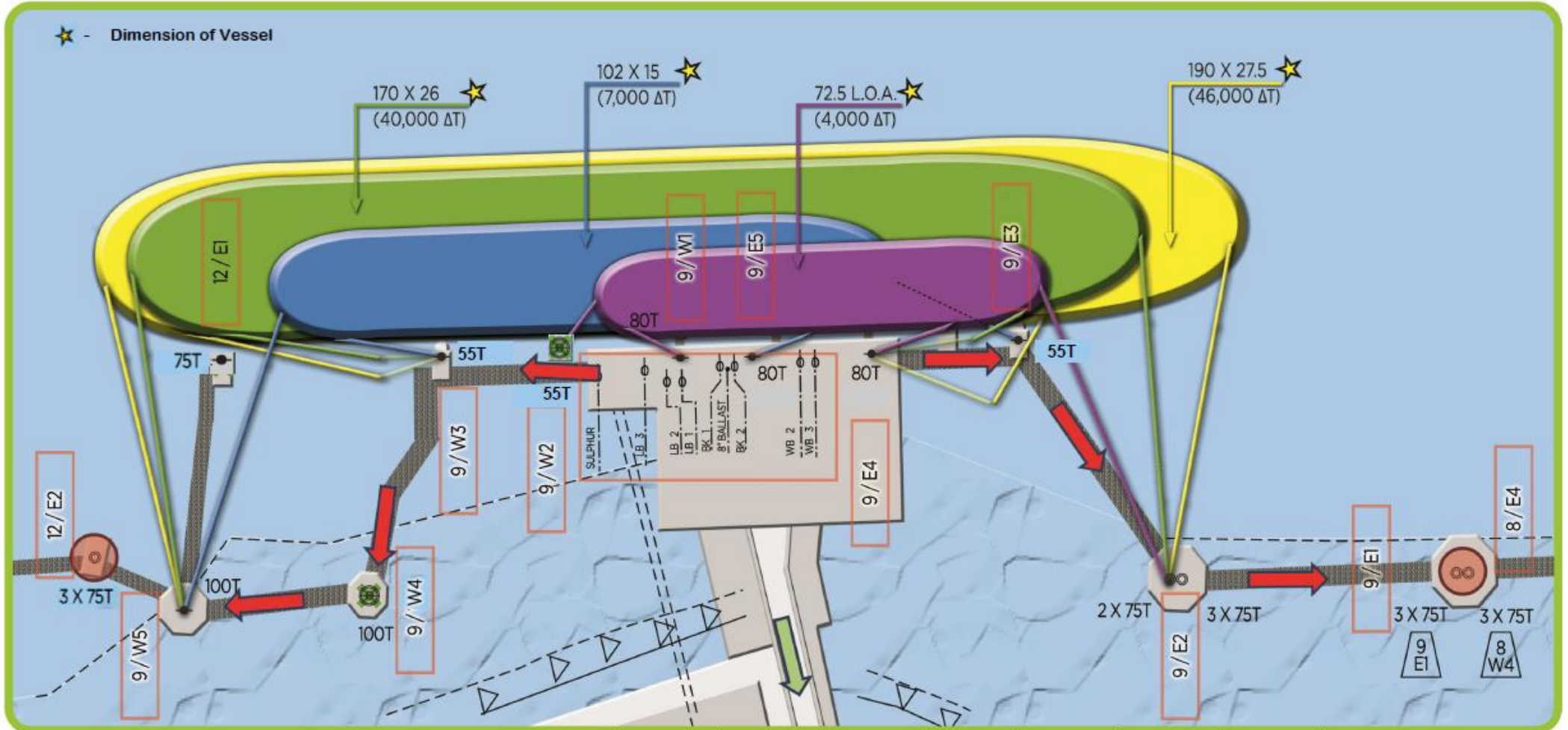


- BOLLARDS
- QUICK RELEASE HOOKS
- ⊗ REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
- MOORING POINT IDENTIFICATION
- FENDERS
- LOADING ARM

MLA	WB1	WB2	WB3	WB4	WB5	BB3	BB4
CARGO	LSGO MOGAS NAPHTHA	MOGAS NAPHTHA JET	GASOIL JET	MOGAS NAPHTHA JET	CRUDE	CRUDE	CRUDE
CONNECTION SIZE	10"	10"	10"	10"	10"	12"	12"



BUKOM WHARF 9 - MOORING LAYOUT

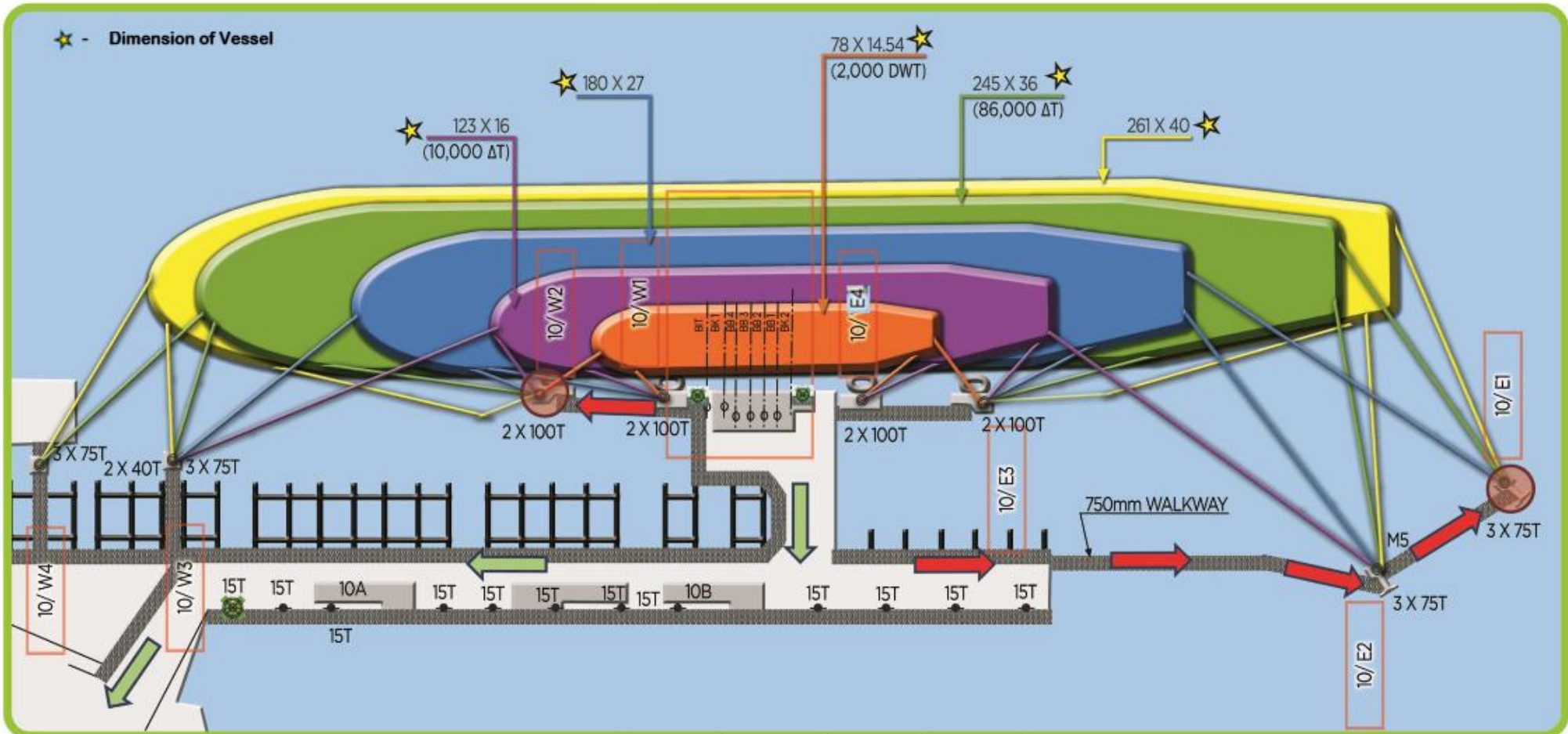


●	BOLLARDS
⊗	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
9/E1	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING ARM

MLA	BULK SULPHUR	LB3	LB2	LB1	BK1	BK2	WB3	WB2
CARGO	BULK SULPHUR	LUBOIL	LUBOIL	DACO SLACKWAX	LIQ SULPHUR	-	JET	JET
CONNECTION SIZE	-	12"	12"	12"	8"	8"	8"	8"



BUKOM WHARF 10 - MOORING LAYOUT

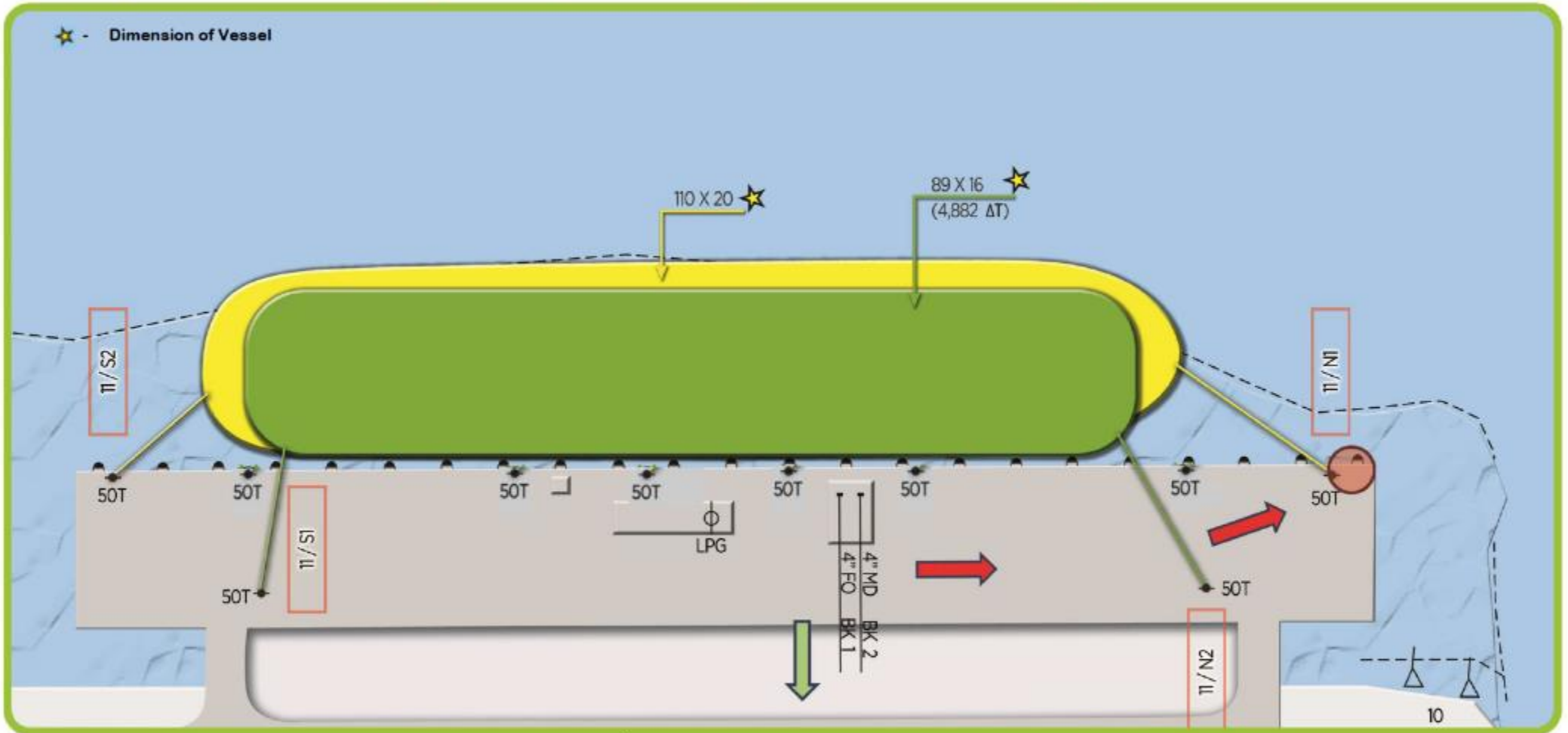
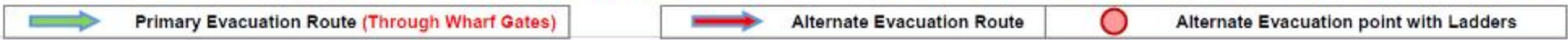


●	BOLLARDS
⊗	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
○	MOORING POINT IDENTIFICATION
⊕	FENDERS
○	LOADING ARM

MLA	BTB	BB4	BB3	BB2	BB1
CARGO	BITUMEN	HSFO	FUELOIL	GASOIL	GASOIL
CONNECTION SIZE	10"	12"	12"	12"	12"



BUKOM WHARF 11 - MOORING LAYOUT

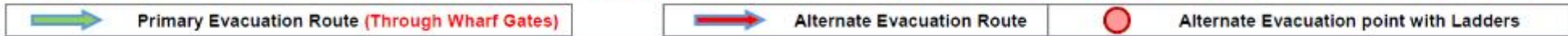


◆	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
11/S1	MOORING POINT IDENTIFICATION
TY	FENDERS
○	LOADING ARM

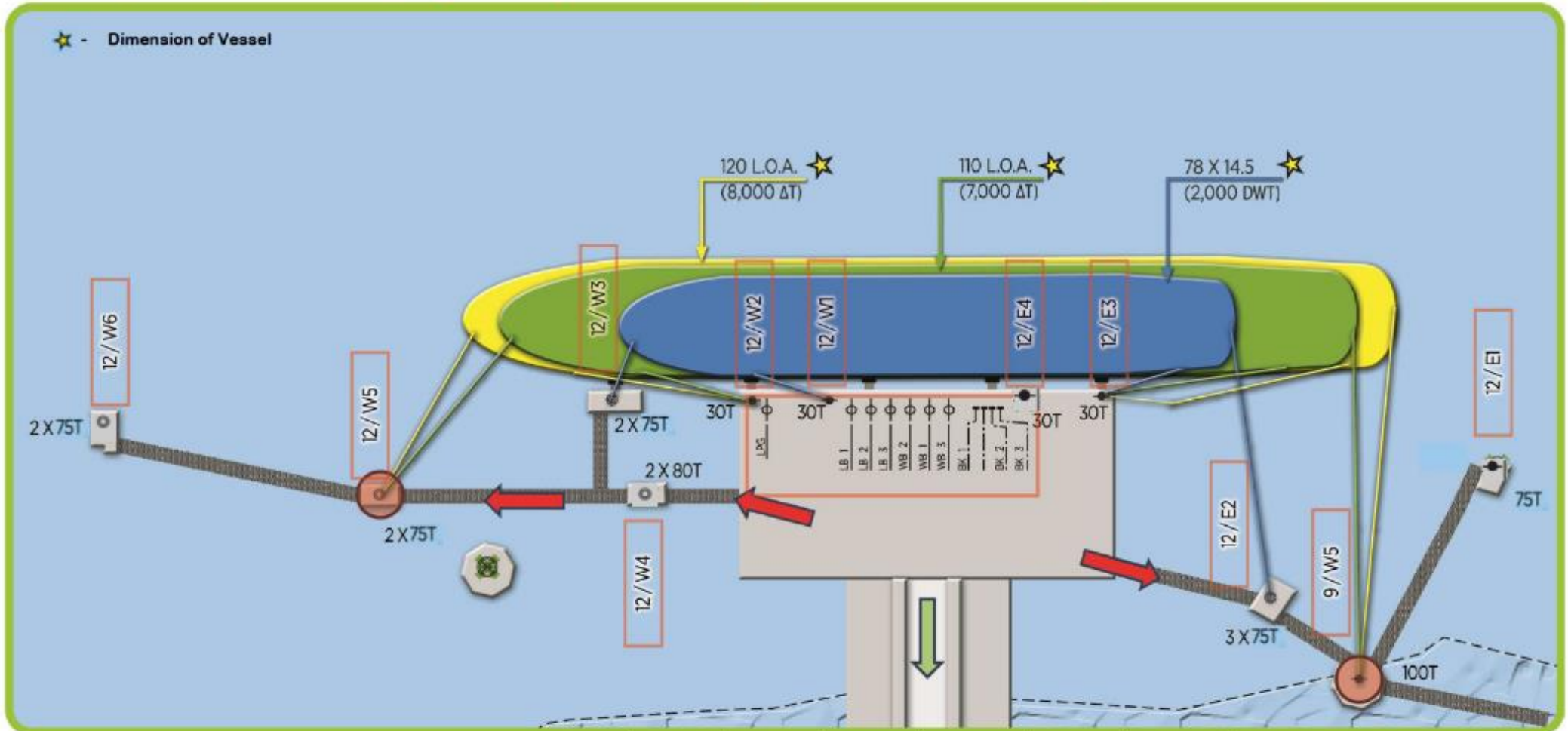
MLA	LPG
CARGO	LPG/PP
CONNECTION SIZE	6" / 3" VPR



BUKOM WHARF 12 - MOORING LAYOUT



★ - Dimension of Vessel



◆	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
□	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING ARM

MLA	LPG	LB1	LB2	WB2	LB3	WB1	WB3
CARGO	LPG	LUBOIL	LUBOIL	MOGAS	DACO SLACKWAX	LSGO MOGAS	JET
CONNECTION SIZE	6" / 3" VPR	6"	6"	8"	6"	8"	6"



BUKOM WHARF 13 - MOORING LAYOUT

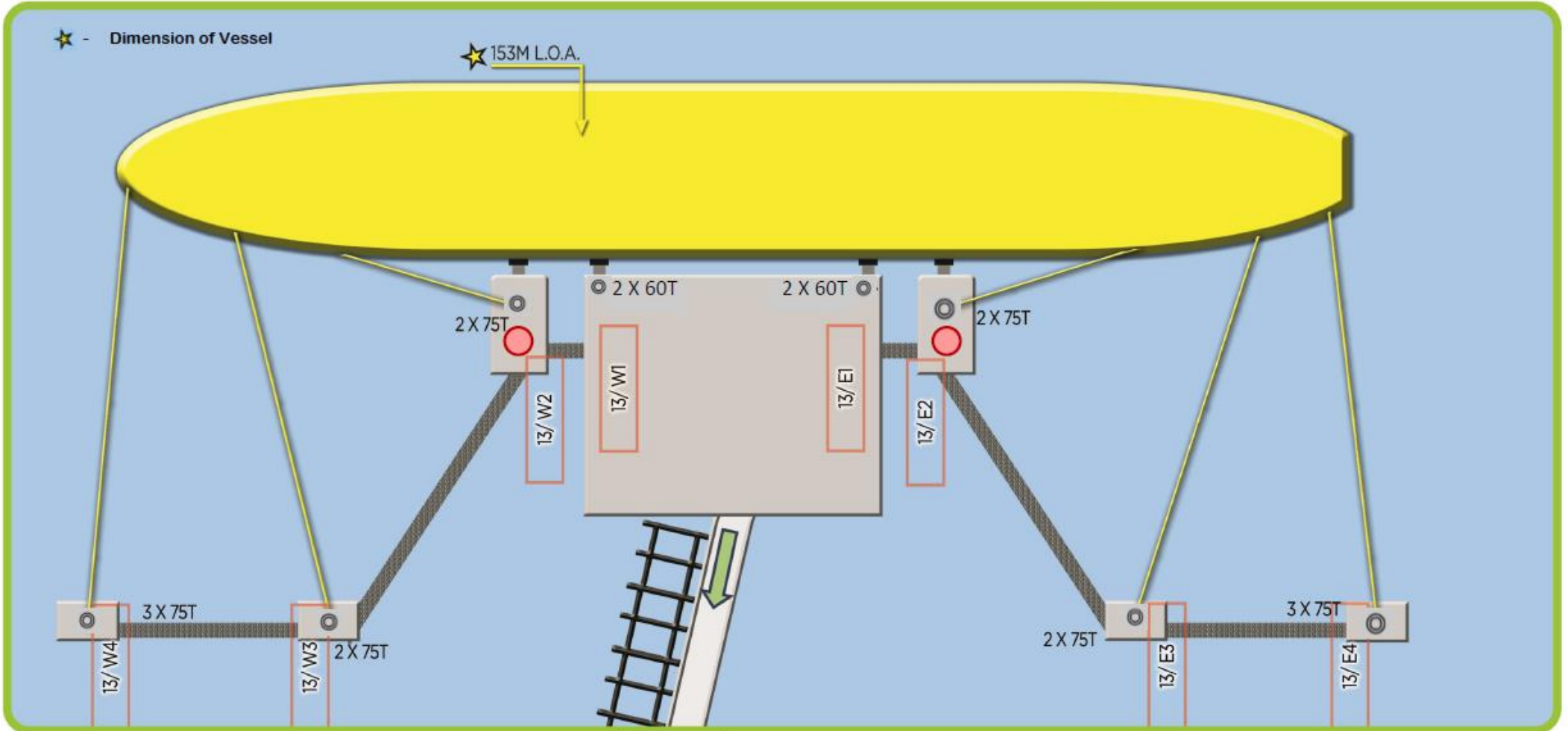
➔ Primary Evacuation Route (Through Wharf Gates)

➔ Alternate Evacuation Route

● Alternate Evacuation point with Ladders

★ - Dimension of Vessel

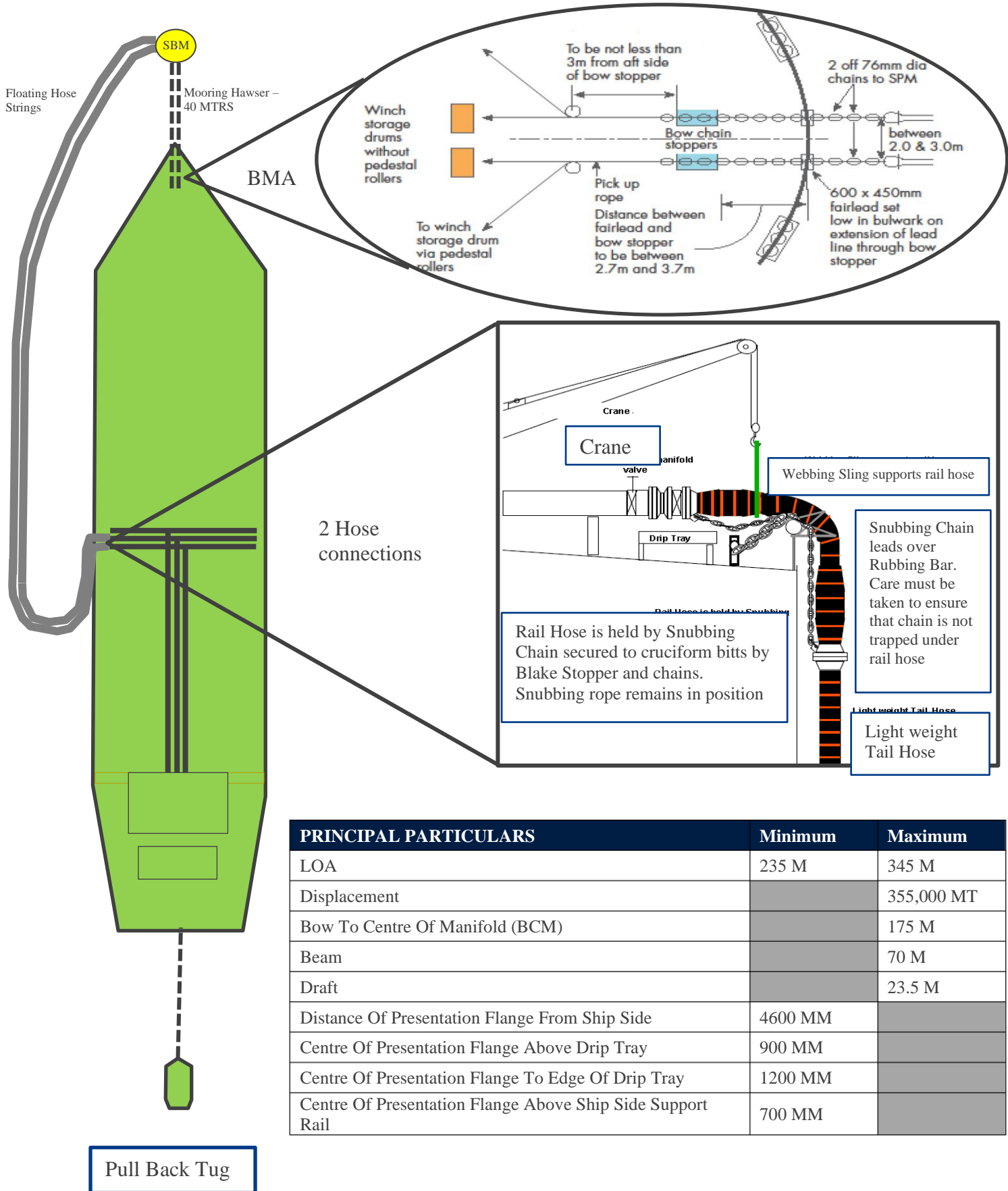
★ 153M L.O.A.



●	BOLLARDS
⊙	QUICK RELEASE HOOKS
⊗	REDUNDANT BOLLARDS / QUICK RELEASE HOOKS
13/W1	MOORING POINT IDENTIFICATION
TT	FENDERS
○	LOADING ARM

MLA	16601	16602
CARGO	ETHYLENE	ETHYLENE
CONNECTION SIZE	6" / 3" VPR	6" / 3" VPR

SBM



PRINCIPAL PARTICULARS	Minimum	Maximum
LOA	235 M	345 M
Displacement		355,000 MT
Bow To Centre Of Manifold (BCM)		175 M
Beam		70 M
Draft		23.5 M
Distance Of Presentation Flange From Ship Side	4600 MM	
Centre Of Presentation Flange Above Drip Tray	900 MM	
Centre Of Presentation Flange To Edge Of Drip Tray	1200 MM	
Centre Of Presentation Flange Above Ship Side Support Rail	700 MM	

APPENDIX 4 – CARGO SURVEYOR EQUIPMENT MANAGEMENT ON SHIPS

APPENDIX 4

CARGO SURVEYOR EQUIPMENT MANAGEMENT ON SHIPS PULAU BUKOM



Note:

1. VCV – Vapor connection valve
2. Equipment comparison permissible variance
 > Temperature +/- 0.1°C
 > Working tapes/bobs +/-2mm (for any distance from 0-30mtrs)
3. Closed type (gas-tight) gauging/sampling equipment should be used for **ALL** crudes (irrespective of H₂S concentration)
4. As part of PBO & TIB, Master acknowledges terminal requirement regarding the use of surveyor gauging equipment for official ullaging and quantification of grades(s) nominated or in-transit.

