Initial Environmental Examination Report

Project Number: 50138-001
June 2017

SRI: Shipyard Rehabilitation and Infrastructure Project

Prepared by AECOM

AECOM

INITIAL ENVIRONMENTAL EXAMINATION REPORT FOR PROPOSED SHIPYARD AT MUTWAL, COLOMBO,

WALKERS COLOMBO SHIPYARD (PVT.) LTD.

Prepared for:

Asian Development Bank

MTD Walkers PLC

September 2016

Initial Environmental Examination (IEE) Report

Prepared for

Asian Development Bank (ADB)

Prepared by

AECOM India Private Limited

Date: September 2016

Quality Information

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Revision History

Revision	Revision Date	Details	Authorized Signatory Name/ Position	Signature
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EXECUTIVE SUMMARY

E.1. Introduction

MTD Walkers PLC (hereinafter referred to as 'MTD Walkers') is an engineering and infrastructure firm based in Sri Lanka, with established track record in multidisciplinary engineering activities, both locally and overseas. MTD Walkers has a robust portfolio of infrastructure related business in civil engineering, mechanical engineering, electrical engineering, pile construction, power generation, marine engineering and real estate. The company was founded in 1854 as John Walker and Company as a manufacturing firm for coffee machinery at Kandy. In 2006, the company acquired CML Edwards Construction Ltd. and was restructured to form Walkers CML. Thereafter, in 2009, MTD Capital Bhd acquired the Walkers Group of companies from Kapila Heavy Equipment, subsequently rebranding the Group as MTD Walkers PLC.

With the vision of further diversification in the marine engineering sector, MTD Walkers has launched the Walkers Colombo Shipyard (Pvt) Ltd. (hereinafter referred to as 'WCS') and Walkers Galle Shipyard (Pvt) Ltd. (hereinafter referred to as 'WGS'), both being ship repair facilities in Colombo and Galle respectively. In order to streamline the management of marine engineering business, MTD Walkers intends to incorporate Walkers Shipyards Limited (hereinafter referred to as 'WSL') which will be the holding company of the marine engineering division. As part of this endeavour, MTD Walkers seeks investment from the Asian Development Bank (hereinafter referred to as 'ADB') in its marine engineering infrastructure facilities.

MTD Walkers have engaged AECOM India Private Limited (hereinafter referred to as 'AECOM') to carry out an Initial Environmental Examination (IEE) for the proposed shipyard at Mutwal, Colombo as per the requirements of ADB Safeguard Policy Statement, 2009. The IEE was undertaken on the basis of reconnaissance survey of the project site and surrounding areas, baseline assessment through desk based literature survey and environmental and social impact analyses. An Environmental and Social Management Plan (ESMP) was formulated for mitigating adverse impacts.

E.2. Description of the Project

The Mutwal Fisheries Harbour in Colombo was being managed by Ceylon Fishery Harbours Corporation (CFHC). The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., through a 25 year lease agreement to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015. The Colombo ship repair yard is being developed on land marked Lot 1 situated within the premises of Mutwal Fisheries Harbour.

The Colombo shipyard is located in Colombo Division in Colombo District of the Western Province of Sri Lanka, adjacent to the Colombo Port at an aerial distance of 3 km towards south west. Several small houses belonging to the fishing community are situated immediately north of the site. There are few settlements immediately east of the site at about 200 m from the harbour boundary.

WCS is currently led by the CEO cum Managing Director who reports to the Board of Directors of MTD Walkers. The management at site is controlled and led by the General Manager, supported by Design Engineer, Production Engineer, Purchasing, Quality Control and Inspections. The Fire and Safety Officer at site is responsible for ensuring safe practices at site, implementation of incident reporting system, work permit system and conducting training sessions and mock drills for construction phase employees and workers.

WCS proposes to develop ship building and ship repair facilities at the Colombo shipyard, for vessels such as naval vessels (up to 65 m), fishing vessels, landing crafts, passenger vessels, works vessels and barges. The shipyard will comprise of following facilities:

- Ship lifting and Transfer System (1250 Tons capacity) for dry repair of vessels: The system will have capacity to lift vessels of up to 130,000 DWT. The repair pier can accommodate vessels of up to 42 m in length and up to seven (7) vessels can be repaired at any one point of time.

- Boat lift and Slip way (50 T capacity) for repair of small vessels and fishing boats
- Floating repair areas and Workshop: floating repair services for vessels up to 80 m in length at the northern end of the pier and workshop towards the south eastern end
- Worker Accommodation and Office building for about 200 workers

Apart from the above facilities, the Central Workshop under the Walkers and Sons Engineers (Pvt) Ltd. will be utilized as the support facility to the shipyard as repair and maintenance works of vessels which involve general fabrication will be undertaken at the workshop. The Central Workshop is currently located at Sapugaskanda and will be shiftedto an industrial area in Delkanda, owned by the State Engineering Corporation (SEC).

The construction phase of the proposed Project will involve procurement of raw materials and equipment, construction of slip way, installation of ship lift, civil works for associated buildings, construction of roads and drainage structures, welding/cutting onsite, installation of pumps and mechanical and electrical installations. The construction activities were scheduled to be completed by early 2017.

The construction works will also entail piling and dredging works. The existing draft at the harbour is about 4 – 6 m and capital dredging activities up to 8 m depth will be required to be undertaken. The dredging works will be carried out by the Ceylon Fishery Harbour Corporation (CFHC) using grab hopper dredger. The dredged material will be disposed at permissible areas beyond 5 nautical miles (nm) from the harbour limits as per the permit issued by MEPA to CFHC[1]. The boulders in the dredged material will be reused by MTD Walkers for construction works, mainly for filling low lying areas. The piling activity will be undertaken by M/s Walkers Piling (Pvt) Ltd., which is a group company of MTD Walkers. WCS has engaged Sri Lanka Land Reclamation and Development Corporation to dispose piling extracts in government permitted areas. The nearest filling yard for disposal of piling extracts is at Muthurajawela Zonal, near Shell terminal.

The various resource requirements for construction and operation phases of the project are given below:

Resource	Construction	Operation
Water	Water will primarily be used for construction activities, drinking purpose and in toilets by construction workers and site employees. About 10,000 litres per day of water will be used for domestic use at site, sourced from Water Supply and Drainage Board, Municipal Council of Colombo.	▪ *Uses:* Domestic usage will be limited to cooking, drinking, washing and flushing purposes while during vessel maintenance/ repair, water will also be required for cleaning of vessel hull and inner compartments, hydro blasting, etc. ▪ *Permitted Quantity:* 20,000 litres per day ▪ *Estimated quantity:* 10,000 litres per day for hydro blasting activities and 10,000 litres per day for domestic usages ▪ *Source:* Water supplied from Water Supply and Drainage Board, Municipal Council of Colombo
Power	The power requirement during development of the shipyard will be limited to activities such as cutting, welding, fabrication, forging, grinding, drilling, etc. Since the shipyard is located within the Mutwal Harbour premises, existing power connection will be used.	▪ *Estimated requirement*: About 1.0 MW of power will be required for the operations. ▪ *Source:* Power will be sourced from the grid (Ceylon Electricity Board) through transformers and low tension power cables.
Labour	The construction phase manpower requirement is estimated to be about 200 workers. The workforce will primarily comprise of qualified welders, fabricators, electricians, mechanics, steel workers, concrete workers and helpers. The workers will be mostly locals from nearby areas. The project does not require setting up of labour camps during the construction phase of the project. All construction workers will be engaged by WCS through	About 200 workers will be engaged for ship repair and building activities once the ship yard is fully operational. Skilled staff will include - docking staff, pump operators, sponge jet blasting operators, machinists, lathe workers, fabricators, welders, electricians and housekeeping staff. Most of the skilled staff will be engaged through manpower supplying agencies. WCS will also have its own permanent employees comprising of dock master,

[1] Sub-sec 7(1), under Section (I) of Marine Pollution Prevention Act, No. 35 of 2008, the Marine Environmental Protection Authority (MEPA) shall specify the location of dumping sites in every permit issued for dumping of dredged material. Schedule II of the Act provides the sediment quality guideline for dredged material proposed for dumping at sea.

Resource	Construction	Operation
	contractors	engineers, maintenance managers, procurement executives, finance, HR and administration personnel.
Land	As per the lease agreement between Ceylon Fishery Harbours Corporation and Sea Gulf UK (Pvt.) Ltd., dated 14th November 2014, the ship repair yard is being developed on land marked Lot 1 situated within the premises of Mutwal Fishery Harbour. No additional land has been procured or is required to be procured for the project. The Fishery harbour owns a cold storage that is located adjacent to the project premises. WCS proposes to use the cold storage unit however no formal arrangement has yet been executed between WCS and Fishery Harbour Corporation.	--

E.3. Description of Baseline Environment

E.3.1. Physical Environment

- Bathymetry: Secondary sources suggest that the average water depth in the immediate vicinity of the project site ranges from 0 - 16 m.
- Salinity: Secondary studies suggest that the annual mean surface salinity of the region varies from 34 - 34.5 psu. Surface salinity gradually increases as one move away from the coast.
- Sea Surface Temperature: The annual mean surface temperature of the region is 28.7°C. The mean temperature varies from 27.5°C to 29.5°C. With depth temperature slightly decreases up to the depth of two meters and remains constant beyond.
- Chlorophyll distribution: Chlorophyll concentration in the water in project area varies between 2-10 mg/m^3. Highest Chlorophyll values are recorded from the seaward side while the lowest values were recorded from landward side.
- Sea Level: Seasonal sea level variations occur due to salinity and temperature variations. The variation at Colombo reaches up to 20 cm. Higher and lower sea levels are observed during the December and July respectively.
- Tides: Tide in the project area is semi-diurnal, i.e. there are two high and two low waters on each lunar day (24.84 hrs). The mean tidal range is 40 cm, spring tidal range is 60 cm while neap tidal range is 12 cm.
- Water current: In the project area, the current velocity is stronger during the South-West monsoon (May to July) than that of North-East monsoon (November - January). The maximum current observed in the area during the South-West monsoon (SWM) is 27.5 cm/s, the minimum current is 12.5 cm/s. The maximum tidal current velocities are between 2 - 15 cm/s in the north-south direction and 2 - 5 cm/s in the east-west direction. The magnitude of the wind induced currents varies from 2 - 10 cm/s. The predominant direction of the current is north.
- Coastal Morphology and Drainage Pattern: About 2 km north of the project site is the outfall point of River Kelani. The Kelani River is believed to contribute some 100,000 - 200,000 m^3/year to the sediment budget of the area based on studies conducted by the CEA and CCD as part of Coastal Resources Management Project (1999). The Project is located within the existing port wherein the coastal area is already modified with existing structures. Exposure of coastal area to the project activities is limited. The development of the project is therefore not likely to contribute to coastal erosion in the area considering the limited rate of erosion and sufficient rate of sedimentation from the Kelani River.
- Climatology: The rainfall pattern in Sri Lanka is characterized by two tropical monsoons, southwest monsoon from May to September and northeast monsoon from December to February. The total annual rainfall experienced in the Colombo district is normally in the range of 1500 – 2500 mm. Similarly, the temperature data for the period 2011- 2013 shows that maximum temperature in the district ranges from 30.6 – 31°C while minimum temperature ranges from 24.9 – 25.9°C.
- Ambient Air Quality: Ambient air quality is routinely monitored in Colombo by CEA who operate a network of ambient air monitoring stations. Air quality measurements have been carried out at the

vicinity of the Colombo Port on October 2014 and February 2015 indicate that ambient air quality levels in the area are within the standards stipulated by CEA.

E.3.2. Biological Environment

The marine areas near the Project area have several submerged reefs, such as Palagala reef and Vatiya reef, though covered with fine sediments. However, the reefs are located more than 1 km from the project site. The reefs consist mostly of soft corals, the most abundant organisms being gorgonian corals followed by dendronephthyan corals. However none of the coral species reported from the area is endemic or included in the national threatened list (MOE 2012) or restricted export category (Gazettes Nos. 1036/3 of July 1998 and 1098/3 of September 1999).

The most abundant species of reef fish reported from the area is damselfish (Family: Pomacentridae). None of the fish species reported are listed as threatened species (MOE 2012).

Several reefs are found more than 1 km north of the project site that can be categorized as nearshore reefs and offshore reefs. Apart from coral reefs, no other coastal habitats such as mangroves are found within or near the project area.

Five of the most threatened species of sea turtles are reported along Sri Lanka coasts. No dolphins or whales are reported from the study area, though few might be encountered occasionally due to seasonal migrations. Studies conducted on dolphin encountered in the offshore large pelagic fish catches in the west coast revealed that spinner dolphin was encountered in gillnets in the area (Dayaratne and Joseph, 1993). However their sighting and occurrence is rare and unpredictable.

The project area, i.e. up to 5 km radius around the Mutwal harbour supports a variety of fishery resources mainly pelagic species, both finfish and non-finfish. The most important small pelagic fish species belongs to family *Clupeidae* and *Engraulidae*. The recorded species and habitats in the area are of low ecological value.

E.3.3. Socio-economic Environment

The total urban population of the Colombo D.S. Division[2], under Colombo District, was recorded to be 323,257 for the year 2013[3] (Source: District Statistical Handbook), which is about 13.9% of the total population of the District. The population density was 180 persons per hectare. Out of the total population in the Colombo DS Division, 50.3% comprise males and 49.3% comprise female population. The sex ratio of the DS Division is 1.01 (number of males per 100 females).

Fishing is predominantly carried out in the open marine waters north of the Kelani River and in the Onagala area. There is one fishing ground, Modera, about 1.5 km north of the Project site. As per the Statistical Unit of the Ministry of Fisheries and Aquatic Resources, about 148 fishing fleets operate in Modera and the total fish production in 2014 was about 1526.8 MTs per annum. Several types of fishing gear such as gill nets, drifting trammel nets and mechanized trawlers are used. Three categories of fishing crafts are operational in the area – namely Fiber Reinforced Plastic Boats (OFRP), Non-mechanized Traditional Boat (NTRB) and Beach Seine Boat (NBSB). The fish production is based on the type of fishing craft, with NBSB having highest quantity of catch in the range of 2000 kg/ month followed by OFRP at about 600 kg/ month and NTRB having about 300 kg/month of fish catch. There are specific seasons for operating specific types of fishing vessels, however trawling is carried out throughout the year. The Mutwal Fishery Harbour is a fishing vessel berthing area and there are few anchorage/ fish landing sites nearby. However no significant impacts on the activities at these sites are anticipated in view of the Proposed project as the fishing grounds are located at significant distance from the project site.

The Colombo city has its own unique colonial history. The Fort and Pettah are two distinct areas in Colombo city. Colombo Fort has been declared a special area because of the many historic buildings that come under the Urban Development Authority. The Project will not directly affect buildings of heritage interest in Colombo City.

[2] Colombo District is divided into 13 Divisional Secretary's Division (DS Divisions), each headed by a Divisional Secretary.
[3] Source: District Statistical Handbook

No culturally important or archaeologically significant areas will be impacted due to development of the shipyard as it will be situated within the already existing Mutwal Harbour.

E.4 Anticipated Environmental Impacts and Mitigation Measures

E.4.1 Pre-Construction Stage Impacts and Mitigation Measures

Pre-construction stage of the project involves activities such as site selection, land procurement for the proposed facilities etc. It can have wide ranging but limited impacts owing to the scale of project facility on land, soil, water resources, flora and fauna, and socio-economic environment.

As discussed earlier, the Project is being set up within the existing Mutwal Fishery Harbour area (approx. 2 hectares). The land has been obtained on lease from the Ceylon Fisheries Harbours Corporation. No additional land has been procured or will be procured for the Project. Thus the land procurement does not involve any involuntary resettlement or loss of livelihood. Site preparation does not involve extensive clearing or removal of vegetation. Hence, environmental impacts due to clearing of vegetation are anticipated to be negligible. No endangered fauna species exist in the area. Thus, there will not be any impacts on terrestrial flora and fauna.

E.4.2 Construction Stage and Mitigation Measures

Impacts on Marine Ecology: The area is characterized by presence of macro zoo benthic organisms though none of these species is included in the IUCN list of threatened species (MOE 2012). Although dredging will cause the complete removal of all benthic communities present within the area of the proposed dredging works, the community should begin to re-establish itself almost immediately after the cessation of the dredging. Dredging can give rise to sediment blooms with high levels of suspended solids, especially close in to the dredger head, however it will be of short duration and is not expected to adversely affect the aquatic biota. Piling activities will generate noise and vibration that can have adverse impacts on the marine fauna such as fishes. However the harbor area, also being closer to the Colombo Port, is already exposed to various noise generating activities of man-made nature, it is expected that fishes have adapted in such an environment. Runoff from the construction area can lead to deterioration of the marine water quality.

The dredged material and piling extracts are being utilized for filling low lying areas. Toilets provided at site for workers and employees are connected to septic tank. During piling activities, soft start procedures will be adopted (i.e. commencing with reduced noise level to allow fishes to move away from the area before increasing the noise levels gradually).

Impacts on Water and Sediment Quality: The marine area around the dredge site may experience a temporary increase in sediment levels during the dredging operations, which will quickly revert back to normal levels. Use of machinery and equipment will require storage of materials such as fuels and other chemicals at site, which can lead to contamination of groundwater, marine water and sediment through improper transport, storage or handling. Inadequate disposal of sewage can lead to further deterioration of water quality.

All storage facilities will be designed with paved surface and adequate secondary containment to prevent any runoffs into the sea. Toilets will be connected to septic tanks and construction workers will not be allowed to dispose any kind of waste into the marine waters.

Impacts on Ambient Noise Quality: Noise generation will be primarily from operation of construction machinery and equipment such as generators, compressor, pumps, pneumatic tools, vibrators, concrete mixers, cranes and piling machine. High noise levels will create disturbance to the nearby habitations. Vibration from piling activities will also create disturbance to marine fauna.

The project will ensure adequate planning to avoid high noise activities. Acoustic enclosures and noise barriers will be provided in areas of high noise generating sources. Noise absorbers and dampeners will be provided.

Impacts on Ambient Air Quality: Project related construction activities are likely to add on to the existing PM and dust levels in the area. Diesel generators will be regularly maintained so as to ensure that emissions from fuel combustion remain at design levels. Proper maintenance will be undertaken for all machines and equipment used at site.

Traffic and Transport related Impacts: Transportation of machinery and construction supplies/materials using shipping vessels and through roads will result in additional traffic, temporarily around the project site. Additional transportation may lead to congestion of the navigation channel during peak hours as the site is close to the Port area. WCS will ensure that all vessel movement is undertaken as per the guidelines /norms laid down by the Sri Lanka Port Authority for the Colombo Port Area.

Impacts on Socio-economics: The construction works will involve local labour and influx of migrant workers is not envisaged. Labour camps will not be set up for the project. Moreover the project is located in an urban set up. The interaction between the workforce and community will therefore be limited. WCS will implement a grievance redressal mechanism for the community wherein any of the surrounding community members can raise complaints related to construction activities.

Occupational Health and Safety related Impacts: The most common causes of occupational injuries in construction are over exertion, ergonomic injuries, slips and falls on the same elevation associated with poor housekeeping, injuries associated with working at heights (ladders, scaffolding, and partially built or demolished structures), moving machinery and exposure to hazardous materials, hot jobs and electrical works. Such risks can be mitigated through implementation of adequate health and safety measures. Workers will be adequately trained on use of machinery and equipment and good housekeeping practices will be implemented at site. Use of PPE will be made mandatory at site.

E.4.3 Operation Stage Impacts and Mitigation Measures

Impacts on Water Resources, Marine Water and Sediment Quality: The potential impacts on the water and sediment quality will include – discharges/ runoffs from shipyard with elevated concentrations of hazardous constituents, improper disposal of bilge and contaminated ballast water from incoming vessels, temporary disturbances due to maintenance dredging activities, erosion due to unplanned dredging activities. The establishment of the shipyard may alter the localized sedimentation pattern of the marine area around or in immediate vicinity of the project which could lead to minor changes in bathymetry thus affecting the navigation.

WCS will ensure efficient use of water during operations. Septic tank along with soak pits will be provided at the facility for treating the sewage generated. An Effluent Treatment Plant (ETP) will be put in place for treatment of all waste water streams collected from vessel repair activities. An Oil Water Separator will be provided with the ETP for treatment of bilge and other oil contaminated water. Curtains/ shrouds with durable material will be utilized during application of antifouling paint, in order to avoid accidental spillage into the waters. All blasting residues clean-up will be channelled to the ETP. Oil/water separators, booms, skimmers or other methods will be employed to handle oil spills and minimize related contamination. The requirement of maintenance dredging will be minimized to the extent possible.

Ecological Impacts: The impact on marine ecology will be mainly because of the generation of pollutants mentioned under marine water and sediment quality section above. Release of heavy metals and pollutants will lead to bio-accumulation, whereas release of bio-toxins associated with antifouling can lead to increased mortality or elimination of algal group and related species. Release of oil contents on to water will result in formation of a shining film on the surface of water which prevents dissolution of oxygen and penetration of sunlight critical for planktons and flora. There will also be temporary disruption of benthic ecology during maintenance dredging activities though it will not have significant ecological impacts.

In order to ensure that the project will have minimal impacts on marine ecology, WCS will ensure that all operational wastewater and sewage is treated prior to disposal. All hazardous waste will be handled and stored adequately to avoid any runoffs.

Impacts on Ambient Noise Levels: As per secondary studies conducted in the Port area[4], baseline ambient noise levels in the area was observed to be in the range of 63 – 73 dBA during day time and in the range of 58 – 71 dBA in the night time. Night time noise levels exceeded the permissible levels possibly due to contribution of vehicular noise and other Port related activities. Existing harbour activities such as loading and unloading of fish catch already contribute to the high noise levels in the project area. During O&M phase, repair and maintenance

[4] Supplementary EIA Report for Proposed Colombo Port City Development Project, Colombo, Sri Lanka, December 2015

activities from the shipyard operations will create additional noise. The overall potential noise impacts associated with the operational activities are therefore not likely to be significant.

All motors, pumps and compressors will be provided with acoustic enclosures and rubber paddings as noise control measures. All machinery and equipment will be provided with adequate maintenance to ensure reduction of unwanted noise from loose components. High noise generating activities will be prevented during night time to avoid disturbance to the local community. WCS will also explore the possibility of a vegetative belt along the eastern periphery to reduce noise reaching the residential areas. In general, noise generation will be minimized by using physical barriers and enclosures around noise sources.

Impacts on Navigation: The facility being within an existing harbour will not add significantly to existing traffic or vessel movement. The vessels coming to the ship yard for repair and maintenance are not likely to create any navigational issues for other vessels heading to or from the Colombo Port. However, WCS will ensure adequate planning of vessel arrival and will work with the Sri Lanka Ports Authority at an early stage to resolve any concerns and obtain support for vessel movements.

Impacts on Ambient Air Quality: Although no major air emissions are envisaged during project operations, use of primers, paints, coatings, abrasive blasting, use of DG sets, etc. may result in generation of particulate matter and dust. Abrasive blasting can generate large quantities of dust containing high levels of toxic air contaminants, and potential exposure to dust and air contaminants is a primary health hazard. Another potential health hazard is exposure to asbestos containing materials (ACMs).

However, due to use of special surface cleaning method such as sponge jet and high pressure water blasting, air pollution will be minimized. Any painting works will be shrouded in a dome like fashion to prevent the scatter and loss of pollutants. Tasks that will involve handling of asbestos containing materials will also be performed within shrouds to prevent scatter of airborne asbestos fibres. The disposal of ACM shall be carried out in a way that minimizes asbestos exposure.

Socio-economic Impacts: The project being located in an urban set up will not bring out significant socio-economic changes, except that it will generate direct and indirect employment opportunities for the local community. Any adverse impacts on the surrounding communities will be limited to disturbance due to high noise during the short period of repair and maintenance. Slight increase in traffic may be experienced during the O&M phase. The Project will however not hamper fishing activities in any manner as fishing areas are located far from the site (at about 1.5 km from site).

Sponge grit blasting will be used in surface preparation and painting works will be carried out in covered areas and movable covers to be used. WCS while hiring or contracting vehicles will maintain that the drivers of the vehicles are to possess driver's license. WCS will ensure that security staff do not get involved in unwanted issues with the surrounding community and are well aware of the behavioural aspects. WCS will undertake certain activities as part of their corporate social responsibility (CSR). A specific budget will be allotted by the WCS on annual basis to undertake the activities associated with CSR.

Health and Safety Risks: The potential impacts associated with shipyard operations will include fall and trip hazards, fall from heights, fire hazards, working in confined spaces, potential injuries due to hot works, inhalation of toxic gases and metal fumes, exposure to high noise, exposure to ACMs, etc.

Several mitigation measures can be put in place to minimize adverse impacts. Some of the measures include proper installation of scaffolding, adherence to safe working loads, proper storage and handling of compressed vessels such as gas cylinders, adequate implementation of confined space entry program/ work permit system, mandatory use of PPEs (earplugs, helmets, safety harness, blasting helmets). An asbestos management program will also be implemented at site to ensure that the O&M workers are least exposed to asbestos/ ACM during repair and maintenance of vessels entering the shipyard.

Impacts due to Climate Change: The scenario of sea level rise in Sri Lanka is expected to be 1.0 m. rise by 2070 (Natcom 2000). Sea level rise will lead to increased tidal influence, increased salinity and larger inundation. It is likely that the potential changes in sea level may influence the effective operation of the lifts installed at the shipyard. Specifically, the vertical distance from the point at which the lift assumes the weight of the ship and the elevation of the dolly that transports it laterally would appear to be sensitive to sea level.

MTD has taken this situation in consideration for Mutwal shipyard. An electric operated system (hydraulic driven shiplift and transfer systems) is planned which is by far more vulnerable for the works at sea side, especially taking into consideration, that the sea levels are predicted to rise in the years to come. MTD has designed the winches to be placed on 50mm thick steel plates which shall allow MTD at any time in the future to unlimited raise of the winch positions.

E.5 Analysis of Alternatives

Currently, the ship repair facilities in Sri Lanka are mainly centralized to Colombo Dockyard Ltd (CDL) which predominantly caters for repair of large vessels up to 125,000 Deadweight Tonnage (DWT). There is lack of availability of facilities for repair of smaller vessels and as a result, such repairs as well as small vessel constructions, which could potentially be carried out in Sri Lanka, are drifting to other facilities in the region. Thus it is evident that a strong need exists in Sri Lanka to develop ship building and ship repair facilities for vessels in the size of 1500 – 2000 DWT and to develop facilities for the repair of smaller vessels, fishing boats and crafts. Such facilities are to be developed by the proposed project.

WCS is in the process of developing repair yards at Galle and Trincomalee, locations identified by the Government of Sri Lanka. WCS also considered development of repair facilities in an area close to the Colombo Port, just 3 km from the site, as it is one of the important Ports in this region of Sri Lanka having large number of incoming vessels.

The project is located within an existing harbour (Mutwal harbour) which has been developed after protecting and delineating environmental sensitivities. The construction will require minimal dredging works and the existing pier will also reduce the extent of construction required. The project will not lead to disturbance to the community, and therefore the location is suitable as per environmental and social criteria.

Further, various types of docks were considered during conception and planning of the project. The ship lift was finalised considering the cost, shorter duration of construction and flexibility of development. The sizes of vessels being planned for repair are smaller and may not require large facilities like a graving dock. A ship lift is easier to manage and will not have major construction requirements.

E.6 Information Disclosure and Consultation

Informal consultations were undertaken by AECOM on 30th July 2016 with the fishing community residing near the project area. It was reported that the project has opened up avenues in terms of generation of unskilled and semi-skilled employment opportunities for the local communities residing in the vicinity of the project area. In addition, it was stated that the project once operational would be beneficial for the fishing vessels that would require repair works. The community members were however concerned about noise generation associated with project activities and mentioned that mitigation measures should be adopted to reduce the noise levels.

Besides local communities, informal discussions were held with representatives of the Ceylon Fisheries Harbour Corporation. They informed that the harbour being operational accommodated more than thirty (30) fishing vessels however, with only one shipyard existing and no repair facility within the vicinity, the fishing vessel owners faced a major problem. With the project coming up, they were of the opinion that this would benefit the fishing communities at large as the facility would accommodate around seven (7) vessels at one time which would drastically reduce the repair time period for each vessel. A Public Relation Officer will be appointed at the Colombo shipyard project site to maintain relation with the external stakeholders and his contact details is provided to local communities residing within the vicinity of the project area.

E.7 Grievance Redressal Mechanism

WCS will put in place a two tier grievance mechanism to address the concerns of community or other users in the harbour. Tier I shall comprise of the Site Manager, EHS officer and a representative each from the Port Authority and Local community. If a complaint is not resolved at the first tier, it will be escalated to Tier II that will comprise of the Management representative of MTD Walkers in Colombo, the corporate HR, representative of Port Authority, besides a community leader. In case the complainant is not satisfied he can then take recourse to legal action.

The existence of the grievance redress mechanism, along with details of its members, will be publicised by WCS through various communicative methods like printed materials, displays, face to face meetings, website updation etc. WCS will inform the local community about the GRM and subsequently remind them of this mechanism on a regular basis during the project construction and operation phases.

E.8 Environmental Management Plan

An Environmental Management Plan (EMP) has been formulated for mitigating impacts pertaining to construction and operation phases of the project (detailed in Section 9.1). Environmental monitoring needs to be conducted at regular intervals to assess the efficacy of EMP and identify corrective measures required, if any. The detailed monitoring plan has been provided in Section 9.2.

The estimated capital cost and recurring cost of implementation of environmental management and monitoring measures, including waste water treatment facilities, for both construction and operation phases has also been discussed in Section 9.3. It is estimated that construction phase will require about USD 150,000 capital cost and USD 83,050 recurring cost per annum for implementation of EMP measures. Similarly during operation phase, the capital and recurring costs will amount to USD 390,000 and USD 245,600 (per annum) respectively.

The Project Development Team of WCS will have the overall responsibility for implementation of the construction phase EMP. The Project Development Team from site will report to the General Manager on the progress of EMP implementation. Similarly, the operation phase of the Project will have an EHS Department. A Safety, Environmental and Fire Officer will be deputed at site for managing the EHS issues at site and supervise the implementation of operation phase EMP.

The EMP will be reviewed after receiving all the necessary clearances and permits to include their requirements. The EMP will be reviewed and updated every six months. The Safety & Compliance Team will have regular meetings in order to review the EMP and monitoring plans. The review procedures will cover the review criteria, scope, frequency and methods, as well as responsibilities and reporting results and retaining associated records. WCS will submit the review reports on the progress of implementation of the EMP to ADB on annual basis.

E.9 Conclusion and Categorization

The project is being developed within the existing Mutwal Fishery Harbour managed by Ceylon Fishery Harbour Corporation. There are no significant social impacts associated with the project as no additional land procurement is involved, therefore there are no resettlement issues and no loss of livelihood to the local community. There are no indigenous communities in the project area. Moreover, the project is located within an urban set up and will not alter the socio-economic condition of the area significantly. Further, the project operations will not have any significant environmental issues except wastewater generation and increased noise levels.

As per ADB categorization system, the project has been categorized as ***Category B*** based on Environmental Safeguards as the impacts assessed during the study are site-specific and can be managed through implementation of recommended mitigation measures and ***Category C*** as per Involuntary Resettlement and Indigenous Peoples Safeguards.

1.0 INTRODUCTION

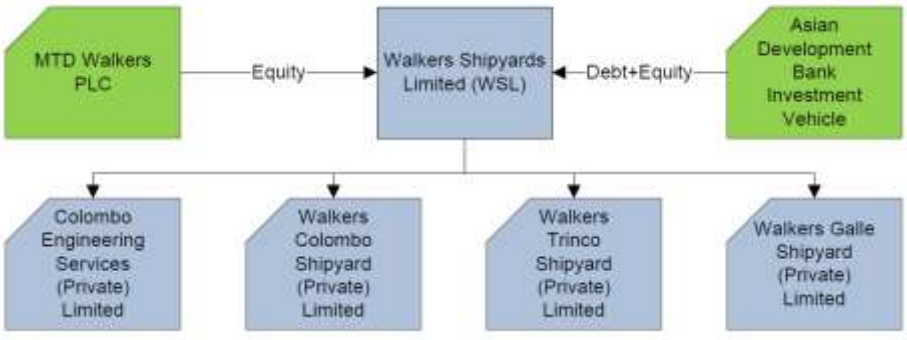
1.1 Background

MTD Walkers PLC (hereinafter referred to as 'MTD Walkers') is an engineering and infrastructure firm based in Sri Lanka, with established track record in multidisciplinary engineering activities, both locally and overseas. MTD Walkers has a robust portfolio of infrastructure related business in civil engineering, mechanical engineering, electrical engineering, pile construction, power generation, marine engineering and real estate. MTD Walkers has been through a period of rapid growth which has resulted in turnover reaching Sri Lankan Rupees ('LKR') 14 Billion for FY-2014/2015 (US$ 104 Million).

The company was founded in 1854 as John Walker and Company as a manufacturing firm for coffee machinery at Kandy. In 1891, the firm assumed limited liability status in the United Kingdom as Walker Sons and Company. With the development and proposed expansion of Colombo Port, the company shifted based to Colombo and entered into the construction industry through Walker Piling (Pvt.) Ltd. In 2006, the company acquired CML Edwards Construction Ltd. and restructured to form a fully integrated infrastructure solutions provider, Walkers CML. Thereafter, in 2009, MTD Capital Bhd acquired the Walkers Group of companies from Kapila Heavy Equipment, subsequently rebranding the Group as MTD Walkers PLC.

In 2013, MTD Walkers acquired Colombo Engineering Services (Pvt.) Ltd. (CESPL) to re-enter the marine engineering business. CESPL is an established firm in marine engineering and repairs within the Sri Lankan shipping industry. With the vision of further diversification in the marine engineering sector, MTD Walkers has launched the Walkers Colombo Shipyard (Pvt) Ltd. (hereinafter referred to as 'WCS') and Walkers Galle Shipyard (Pvt) Ltd. (hereinafter referred to as 'WGS'), both being ship repair facilities in Colombo and Galle respectively. There are further plans to expand services to the east coast of Sri Lanka through establishment of a vessel repair facility at Trincomalee managed by Walkers Trinco Shipyard (Pvt) Ltd. (hereinafter referred to as 'WTS').

In order to streamline the management of marine engineering business, MTD Walkers intends to incorporate Walkers Shipyards Limited (hereinafter referred to as 'WSL') which will be the holding company of CESPL, WCS, WGS and the proposed WTS. As part of this endeavour, MTD Walkers seeks investment from the Asian Development Bank (hereinafter referred to as 'ADB') in its marine engineering infrastructure facilities. ADB will provide a direct loan of $12 million, which will benefit from a corporate guarantee by MTD Walkers. MTD Walkers is in discussions with local commercial lenders, including LB Finance PLC (LBF), to provide the remaining $5 million debt on similar terms. In addition, ADB is planning to invest $3 million equity to support development of the two ship repair yards – WCS and WGS, alongside the company's $13 million injection of fresh equity.



The Mutwal Fisheries Harbour in Colombo was being managed by Ceylon Fishery Harbours Corporation. The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., a ship repair and ship building entity that had entered into 25 year lease agreement with Ceylon Fishery Harbours Corporation to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015.

As per the lease agreement between Ceylon Fishery Harbours Corporation and Sea Gulf UK (Pvt.) Ltd., dated 14th November 2014, the ship repair yard is being developed on land marked Lot 1 situated within the premises of Mutwal Fisheries Harbour.

1.2 Purpose

As per the requirements of ADB Safeguard Requirements 1, projects with significant environmental impacts require an environmental assessment study to be conducted by the borrower. MTD Walkers have therefore engaged AECOM India Private Limited (hereinafter referred to as 'AECOM') to carry out an Initial Environmental Examination (IEE) for the proposed shipyard at Mutwal, Colombo as per the requirements of ADB Safeguard Policy Statement, 2009.

The IEE has been carried out against the following reference framework:

- ADB's Safeguard Policy Statement (SPS), 2009;
- ADB Social Protection Strategy, 2001;
- Policy on Gender and Development, 1998;
- Public Communications Policy, 2011;
- Applicable national and local regulatory requirements;
- Host country obligations under international law.
- IFC EHS Guidelines

Further, in accordance with ADB requirements, an independent evaluation of environmental and social systems of the Project was undertaken, through review and assessment of the environmental, H&S and social compliance of MTD Walkers and operations of its marine engineering arm, in order to ensure compliance with ADB Safeguard Policy Statement, 2009. The observations and gaps identified during the assessment are provided in the form of an Environment and Social Compliance Audit (ESCA) Report, appended as **Appendix A** to this IEE Report.

1.3 Scope of Work

The scope of the IEE study comprises of:

- Reconnaissance survey to assess the existing environmental and social conditions in the project area;
- Consultations with local community and other key stakeholders of the project to understand their expectations from project;
- Collection of secondary environmental, social and demographic information;
- Identification and review of the applicable standards and regulations;
- Evaluation of potential environment and social impacts of the Project and its components (including associated facilities);
- Preparation of Environmental and Social Management Plan (ESMP) based on the findings of the study and develop procedures for mitigation and monitoring of such impacts;

1.4 Methodology

The Initial Environmental Examination for the project has been carried out as per the requirements of ADB Safeguard Policies related to environment and social. The study considers an area of 5 km around the project site as study area.

Reconnaissance survey of the project site and surrounding areas were conducted to identify environmental and social issues in the project area. A desk based literature survey was also undertaken and relevant information was collected for environmental and social baseline assessment.

Based on the baseline and proposed activities, an impact analyses was carried out where potential direct and indirect impacts of the project activities have been considered. An Environmental and Social Management Plan

(ESMP) has been formulated for the Project where measures are proposed to mitigate adverse impacts along with recommended good practices.

1.5 Limitations and Data Gaps

The impact assessment study for the proposed project is largely based on the project information from client, discussion with local community and other stakeholders and observations from various surveys and investigations undertaken in the project area. Professional judgement and subjective interpretation of facts has been applied for this study. Any change in project location, orientation, proposed plant components, proposed project activities is likely to result in variation of the impacts. It is to be noted that any technological advances during the course of construction and execution of the project will alter the extent and severity of impacts on the surroundings.

This report was prepared by AECOM for the benefit of its client, MTD Walkers. AECOM's client may release the information to third parties, who may use and rely upon the information at their own discretion. However, any use of or reliance upon the information by a party other than specifically named above shall be solely at the risk of such third party and without legal recourse against AECOM, its parent, its subsidiaries and affiliates; or their respective employees, officers, or directors; regardless of whether the action in which recovery of damages is sought is based upon contract, tort (including the sole, concurrent, or other negligence and strict liability of AECOM), statute, or otherwise. This information shall not be used or relied upon by a party that does not agree to be bound by the above statement. Any information provided in the present report shall not be considered or construed as legal advice.

1.6 Layout of the Report

The layout of the report is as provided below:

- Chapter 2: describes **Policy, Legal and Administrative Framework**
- Chapter 3: outlines **Description of the Project**
- Chapter 4: details **Description of the Baseline Environment**
- Chapter 5: presents the **Anticipated Environmental Impacts and Mitigation Measures**
- Chapter 6: provides an **Analysis of Alternatives**
- Chapter 7: provides details on the **Information Disclosure, Consultation and Participation**
- Chapter 8: describes the **Grievance Redress Mechanism**
- Chapter 9: provides **Environmental and Social Management and Monitoring Plan**
- Chapter 10: presents the **Conclusion and Recommendations**

The appendices to the report include:

- Appendix A: Environment and Social Compliance Audit Report for Colombo Shipyard

2.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Applicable Regulations at National Level

The Project is required to conform to the applicable national regulatory requirements as identified in Table below. Some of the key laws and regulations applicable to the Project are discussed below.

2.1.1 National Environmental Act (NEA) No. 47 of 1980

The National Environmental Act (NEA) No. 47 of 1980 is the primary regulation that governs environmental protection norms in Sri Lanka. The Central Environmental Authority (CEA), established in 1981, under the provisions of the NEA holds regulatory powers with respect to environmental management in the country. CEA also issues guidelines and standards related to environmental protection.

According to Part IV C of the Amendment Act No. 56 of 1988, all prescribed development projects are required to be subjected to Environmental Impact Assessment. The NEA further stipulates that approval for all prescribed projects shall have to be obtained from the appropriate project approving agencies (PAA) concerned or connected with such prescribed project. CEA is the PAA in present case. Based on the EIA, projects are required to obtain an Environmental Protection Licence (EPL) from CEA prior to commencement of commercial operations. In addition to the EPL, projects are also required to obtain a Licence for the management of their waste, issued by the CEA.

2.1.2 Coast Conservation Act No. of 1981

The Coast Conservation Act No. 57 of 1981 (CCA) and subsequent amendments in 1988 and 2011, governs the coastal zone in Sri Lanka. This zone comprises “the area lying within a limit of three hundred meters landward of the Mean High water Line and a limit of two kilometres seaward of the mean Low Water Line”. In terms of Section 14 of the Act, no person shall engage in any development activity other than a prescribed development activity within the Coastal Zone except under the authority of a permit issued by the Coast Conservation Department. The environmental impact assessment process is part of the permit procedure mandated in Part II of the Act.

The National Environmental Act states that CCA applies to ‘prescribed projects’, as identified by NEA, only if they are located wholly within the Coastal Zone. Nevertheless, as the CCA states that it is established to regulate and control development activities within the coastal zone, the CCD is the final authority to determine whether to permit a development activity in terms of CCA, even though such activity may be required to go through the approval process laid down in the NEA.

2.1.3 Marine Pollution Prevention Act, No.59 of 1981

The Marine Pollution Prevention Act, No.59 of 1981 is an Act that provides for the prevention and control of pollution in Sri Lanka waters. The Act gives effect to international conventions for the prevention of pollution of the sea. There are five international conventions which are given effect in this Act including MARPOL Convention to which Sri Lanka is a signatory. The Marine Pollution Prevention Authority was established in 1981 under this Act.

The Act underwent major revision in 2008 when the Marine Pollution Prevention Act no 35 of 2008 came into force in 2009. The name of the MPPA changed to Marine Environment Protection Authority (MEPA) which is responsible for formulating and implementing National Oil spill Contingency Plan.

As per requirements of the Act, all ships that enter the territorial waters of Sri Lanka should comply with appropriate measures for preventing and controlling pollution of the sea from wide range of sources ranging from sewage to harmful chemicals. These include ships and barges which will supply equipment and machinery for the proposed project and should therefore comply with the requirements of this Act. The Act also requires projects to

have sufficient facilities for abatement of marine pollution as well as contingency measures in place to cope with emergency situations such as oil spills.

2.1.4 Other Development Plans

Coastal Zone Management Plan (CZMP)

The CZMP is the key plan developed by the CCD to address the growing problems of environmental degradation in the coastal zone. The CZMP was developed in 1990 and revised subsequently in 1997 and 2004. The aim of the CZMP is to regulate development within the jurisdiction of the CCD in order to ensure that development pressure is not detrimental to coastal processes. In order to achieve this, the CZMP has identified areas suitable for development activities and corresponding setback limits for intended infrastructure. Though the proposed project does not fall within the framework of a routine development activity on land within coastal zone, it will comply with the provisions of the CZMP.

Master Plan for Coastal Erosion Management

This was developed by CCD in 1986, and revised in 1993, to address the problems of coastal erosion in Sri Lanka. The proposed project will not involve any activity that will have impacts on coastal erosion.

Table 2-1 below presents the EHS and social regulations that are largely applicable to the project.

Table 2-1: EHS and Social Regulations at National Level – Sri Lanka

Sl. No.	Name of Regulation	Description	Regulatory Authority	Applicability and Permit Requirement
	Environment			
1	National Environmental Act (NEA) No. 47 of 1980 and subsequent amendments (1988, 1995, 1999 and 2000)	This Act is the first piece of legislation to deal exclusively with the protection and management of the environment. The Act mandates the establishment of a Central Environmental Authority (CEA) to co-ordinate activities in the field of environment. The amendment Act empowers the CEA to implement a scheme for the control of pollution caused by the discharge of waste, and to assess impacts on the environment from development activities.	Central Environmental Authority (CEA)	Applicable ▪ Environmental Protection License ▪ License to generate and dispose waste
2	Coast Conservation Act No. 57 of 1981	An Act to provide for the preparation of the Coastal Zone Management Plan; to regulate development activities within the Coastal zone; for the issue of permits for prescribed development activities; requirement of environmental impact assessment relating to development activity; permits for the occupation of any part of the foreshore or bed or sea lying with the Coastal Zone.	Coast Conservation Department (CCD)	Applicable ▪ Permit for Development Activity
3	Fauna and Flora Protection Ordinance, No.2 of 1937	For the conservation of National Reserves and Sanctuaries and Marine Reserves; for the protection of national reserves and sanctuaries; protection of birds and reptiles protection of flora; for the issue of licence and permits, preparation of schedules containing lists of birds not protected, birds protected during open season, wild animals and reptiles absolutely protected trees and protected plants and the restriction of development activity - requirement to obtain approval (EIA requirement) under the National Environment Act.	Department of Wildlife Conservation	Not applicable as the project does not involve any protected eco sensitive areas.
4	Wildlife & Nature Protection Society Act No.29 of 1968	This Act incorporates the Wildlife Protection Society of Ceylon with general objects to assist and co-operate in the prevention from destruction of wild animals and plants and to encourage the preservation of wildlife in Sri Lanka in natural conditions.	Wildlife Protection Society	Not applicable as the project does not impact the wildlife.
5	Forests Ordinance, No. 16 of 1907	The law relates, to forests and the felling and transport of timber, declaration of state lands as forests, protection of specified trees as reserved trees; declaration of village forests, control of timber and forest produce in transit, collection of drift/stranded timber, and the compounding of offences.	Conservator Of Forests, Forest Department	Not applicable
6	Water Resources Board Act, No.29 of 1964	The Act establishes a Water Resources Board with duties to advice the Minister on the regulation, development, and conservation of the water resources in the country, construction of schemes of irrigation, drainage, flood control and hydraulic power; control of soil erosion and promotion of afforestation.	Water Resources Board	Applicable
7	National Water Supply and Drainage Board Law No. 2 of 1974	This law provides for the establishment of a Public Authority known as the National Water Supply and Drainage Board. The Board has the general duty of providing water for public, domestic and industrial purposes. The Board is empowered to undertake the exclusive supply of water in Sri Lanka in any order specified by the Minister.	National Water Supply and Drainage Board	Applicable ▪ Permission for Water Connection ▪ Drainage Certificate from

Sl. No.	Name of Regulation	Description	Regulatory Authority	Applicability and Permit Requirement
				Water Supply and Drainage Department of the Municipal Council of Colombo
8	Marine Pollution Prevention Act, No.59 of 1981	An Act to provide for the prevention and control of pollution in Sri Lanka waters. The Act gives effect to five international conventions for the prevention of pollution of the sea. The Marine Environmental Protection Authority (MEPA), earlier known as Marine Pollution Prevention Authority (MPPA), is established under this Act. This Act provides for criminal and civil law for the pollution of Sri Lanka waters.	Marine Environmental Protection Authority (MEPA)	Applicable ▪ No permits required.
9	Maritime Zones Law No. 22 of 1976	The law to provide for the declaration of the Territorial Sea and maritime zones of Sri Lanka. The Territorial Sea, the Contiguous Zone, the exclusive economic zone and the continental shelf are declared under this law. The President may also proclaim a pollution prevention zone and declare the limits of the historic waters of Sri Lanka.		Applicable
10	Fisheries Ordinance No.24 of 1940	This Ordinance consolidates the law relating to fisheries and to the protection of fish in Sri Lanka, fisheries waters and also provides for the registration of local fishing boats, and for the regulation of the fishing industry. The Director of Fisheries is appointed under this ordinance for the administration of the ordinance. There is also a Fisheries Advisory Board.	Director of Fisheries	Not Applicable
11	Regulation of Foreign Fishing Boats Act No.59 of 1979	This Act controls fishing by foreign boats in Sri Lanka waters. The Director/Fisheries is responsible for this Act. Sri Lanka waters means the territorial sea, the contiguous zone, the exclusive economic zone, the historic waters of Sri Lanka and all public rivers, lakes, lagoons and other public inland waters.	Director of Fisheries	Not Applicable
	Land and Land Use			
12	State Lands Ordinance, No.8 of 1947	This ordinance provides for the leasing and other disposition of State land, the management of the foreshore, the regulation of the use of water in lakes and public streams. The ordinance provides for the declaration of reservations for public purposes. The administration of the Ordinance is vested with the Land Commissioner. The ordinance prohibits the leasing or other disposition of any State land situated above 5000 ft.	Land Commissioner	Applicable
13	Land Development Ordinance, No. 19 of 1935	An ordinance to provide for the systematic development and alienation of State Land in Sri Lanka. The Land Commissioner appointed under this ordinance is responsible for the general supervision and control of all Govt. Agents and Land officers in the administration of State Land.	Land Commissioner	Not applicable

Sl. No.	Name of Regulation	Description	Regulatory Authority	Applicability and Permit Requirement
14	Colombo District (low lying areas) Reclamation and Development Board Act No. 15 of 1968	This Act was amended in 1983 whereby the title of the Act was amended to read as "Sri Lanka Land Reclamation and Development Corporation Act". The Act provides for the establishment of the Sri Lanka Land Reclamation and Development Corporation. The Act empowers the Minister to declare any low lying, marshy, waste or swampy area to declare it to be a reclamation and development area for the purpose of the Act.	Sri Lanka Land Reclamation and Development Corporation	Applicable
15	Land Acquisition Act No. 9 of 1950	This Act provides for the acquisition of lands and services for public purposes. Public purpose includes a purpose mentioned in this Act or anything deemed to be a public purpose.	Land Commissioner	Not applicable as the project does not involve land acquisition.
	Cultural Heritage			
16	Antiquities Ordinance No. 9 of 1940	This Ordinance makes provision for the better preservation of the Antiquities of Sri Lanka. Antiquities mean any ancient monument or objects which are believed to date prior to 2nd March 1815. The archaeological Commissioner is responsible for the administration of this Ordinance.	Archaeological Commissioner	Not applicable as no protected monuments are being affected due to project.
	Labour Welfare			
17	Shops and Office Employees Act, 1954	The Act applies to all employees within the definition of a “shop” or “office” and is in five parts including Regulation of hours of employment in shops and offices: health and comfort of employees, Payment of remuneration, Regulation of remuneration, Closing order for shops and General matters.	Commissioner of Labour, Labour Department	Applicable
18	Factories Ordinance No. 45, 1942	This ordinance makes provisions for the supply of welfare of workers in factories. There are special provisions for the health, safety, and welfare of workers. Occupational health is regulated by the Factories Ordinance of 1942 and all persons operating factories are conversant with the comprehensive provisions of this legislation first enacted in 1942.	Commissioner of Labour, Labour Department	Applicable
19	Industrial Dispute Act, 1951	The provisions in this Act relate to the prevention, investigation and settlement of industrial disputes. The Commissioner of Labour is empowered to take necessary steps to permit a settlement by any dispute forwarded to him for any settlement.	Commissioner of Labour, Labour Department	Applicable
20	National Child Protection Authority Act No. 50 of 1998, 1939; No 48 Children and Young Persons Ordinance as amended, 1956; No. 47; Employment of Women, Young Person and Children Act as amended by Act Nos; 43 of 1964, 29 of 1973, 32 of 1984 and the regulations made thereunder	These legislations are aimed at providing welfare for and protection to children and women employed in public or private industrial undertaking and specifies provisions to be made available to them in terms of work benefits, working hours and other terms of employment.	Commissioner of Labour, Labour Department	Applicable

Sl. No.	Name of Regulation	Description	Regulatory Authority	Applicability and Permit Requirement
21	Maternity Benefit Ordinance, 1941	This is a law that was first enacted as far back as 1939. Subsequently, there were seven other amending Acts passed in this regard from 1952 to 1985. An employee is restricted from knowingly employing any women during the period of four weeks immediately following her confinement. “Maternity benefits” mean the amount payable under the provisions of this Ordinance to a woman worker.	Commissioner of Labour, Labour Department	Applicable
22	Workmen Compensation Act, 1935	This Act provides for the payment of compensation to workmen who are injured in the course of their employment. The Ordinance specifies and regulates the employer’s liability to pay compensation and specifies the instances in which the compensation should be paid. The amount if compensation is to be determined by the Commissioner of Labour or his Authorised Officers depending on the nature of injury to the workman.	Commissioner of Labour, Labour Department	Applicable
23	Trade Union Ordinance, 1935	This Act provides for the formation and regulation of trade unions in the country. A “trade union” is defined as any association or combination of workmen or employers, whether temporary or permanent, formed for the reglation of relations between employers and workers.	Commissioner of Labour, Labour Department	Applicable
24	Wages Board Ordinance, 1950	This Act gives provisions for minimum wages and a few other conditions such as holidays, leave and overtime rates in respect of specified trades.	Commissioner of Labour, Labour Department	Applicable
25	Payment of Gratuity Act No. 12, 1983	A gratuity is a lump sum payment made in recognition for services at the end of a period of employment. Under the Act any employer who has employed more than 15 workmen in any industry during the twelve months preceding the termination of the workman in question, is required to pay a gratuity to that workman if he has completed five years of service under him.	Commissioner of Labour, Labour Department	Applicable
26	Employees Provident Fund Act No. 15 of 1958	Employers have to remit every month to the Central Bank, an amount equivalent to 20% of the employee’s total earnings to the Fund. The Employee’s contribution is 8% and the Employer has to contribute an amount equivalent to 12% of the employee’s total earnings. “Earnings” include wages, cost of living allowances and similar allowances, payment in respect of holidays and leave, cash value of food provided by the employer and meal allowance but excludes overtime payments.	Labour Department	Applicable
27	Employees’ Trust Fund Act No. 46 of 1980	This Act obliges the employer only to contribute monthly 3% of the employee’s total wages to the Trust Fund created under it.	Labour Department	Applicable
	Health and Safety			

Sl. No.	Name of Regulation	Description	Regulatory Authority	Applicability and Permit Requirement
18	Factories Ordinance No. 45 of 1942	This ordinance makes provisions for the supply of welfare of workers in factories. There are special provisions for the health, safety, and welfare of workers. Registration and licensing of factories are provided therein. As per this ordinance, all factories should obtain approval from the Executive Director, Engineering Approvals Department, after submission of certified drawings and plans. No work should be commenced at the site without the approval.	Executive Director, Engineering Approvals Department	Applicable ▪ Fire Safety Clearance from Fire Service Department
29	Motor Traffic Act, No.14 of 1951	The law relating to motor vehicles and their use of highways, passenger carriage services and the carriage of goods by motor vehicles and regulations of traffic on highways are dealt with in this Act.	Department of Motor Traffic	Applicable
30	Sri Lanka Ports Authority Act, No.51 of 1979	The Act which provides for the establishment of the Sri Lanka Ports Authority to provide port services for the purposes of Colombo, Galle and Trincomalee. The Minister may also gazette any other ports to which this Act will apply.	Sri Lanka Ports Authority	Applicable
31	Electricity Act No.19 of 1950	This Act is specifically to regulate generation, transmission, transformation, distribution, supply; and use of electrical energy.	Ceylon Electricity Board	Applicable ▪ Electricity Permission

Apart from above, various policies have also been formulated by the Ministry of Environment and Natural Resources of Sri Lanka as listed hereunder. The proposed Project will comply with the requirements of these policies:

- National Environment Policy, 2003
- National Forestry Policy, 1995
- National Air Quality Management Policy, 2000
- National Watershed Management Policy, 2004
- Cleaner Production Policy, 2004
- National Biosafety Policy, 2005
- National Air Quality Management Policy, 2000
- National Policy on Wetlands, 2005
- National Policy on Solid Waste Management

2.2 Applicable Environmental Standards

2.2.1 Air Quality Standards

The ambient air quality standards are defined in the National Environmental (Ambient Air Quality) Regulations, 1994 and are provided below:

Table 2-2: Ambient Air Quality Standards

Sl. No.	Pollutant	Averaging Time*	Maximum Permissible Level	
			µg/m^3	ppm
1.	PM_{10}	Annual	50	-
		24 hours	100	-
2.	$PM_{2.5}$	Annual	25	-
		24 hours	50	-
3.	Nitrogen Dioxide (NO_2)	24 hours	100	0.05
		8 hours	150	0.08
		1 hour	250	0.13
4.	Sulphur Dioxide (SO_2)	24 hours	80	0.03
		8 hours	120	0.05
		1 hour	200	0.08
5.	Ozone (O_3)	1 hour	200	0.1
6.	Carbon Monoxide (CO)	8 hours	10,000	9.00
		1 hour	30,000	26.00
		Any time	58,000	50.00

** Minimum number of observations required to determine the average over the specified period-*
03 hour average – 03 consecutive hourly average.
08 hour average – 08 hourly average.
24 hour average – 18 hourly average.
Yearly average – 09 monthly averages with at least 02 monthly average each quarter.

2.2.2 Wastewater Discharge Standards

The National Environmental (Protection and Quality) Regulation No. 1 of 1990 has stipulated various tolerance limits for industrial wastewater and sewage discharged into inland waters and marine coastal waters. The tolerance limits for discharge into marine coastal waters are presented below:

Table 2-3: Tolerance limits for industrial and domestic waste water discharged into Marine coastal waters (Sri Lanka Standards 721:1985)

Sl. No.	Parameter	Unit, Type of Limit	Tolerance Limit values

Sl. No.	Parameter	Unit, Type of Limit	Tolerance Limit values
1.	Total suspended solids	mg/l, max.	150
2.	Particle size of: (a) Floatable solids (b) Settlable solids	mm, max. µm, max.	3 180
3.	pH at ambient temperature	-	5.5-9.0
4.	Biochemical Oxygen Demand (BOD5 in five days at 200C or BOD3 in three days at 270C)	mg/l, max.	100
5.	Temperature	^{0}C, max.	45^{0}C at the point of discharge
6.	Oils and greases	mg/l, max	20
7.	Phenolic compounds (as C6H5OH)	mg/l, max	5
8.	Chemical Oxygen Demand (COD)	mg/l, max	250
9.	Total residual chlorine	mg/l, max	1.0
10.	Ammonical Nitrogen	mg/l, max	50
11.	Cyanide (as CN-)	mg/l, max	0.2
12.	Sulphides (as S2-)	mg/l, max	5.0
13.	Fluorides (as F-)	mg/l, max	15
14.	Arsenic (as As)	mg/l, max	0.2
15.	Cadmium (as Cd)	mg/l, max	2.0
16.	Chromium, total (as Cr)	mg/l, max	2.0
17.	Chromium, Hexavalent (as Cr6+)	mg/l, max	1.0
18.	Copper (as Cu)	mg/l, max	3.0
19.	Lead (as Pb)	mg/l, max	1
20.	Mercury (as Hg)	mg/l, max	0.01
21.	Nickel (as Ni)	mg/l, max	5.0
22.	Selenium (as Se)	mg/l, max	0.1
23.	Zinc (as Zn)	mg/l, max	5.0
24.	Pesticides	mg/l, max	0.005
25.	Organo-Phosphorus compounds	mg/l, max	1.0
26.	Chlorinated hydrocarbons (as Cl)	mg/l, max	0.02
27.	Faecal Coliform	MPN/100ml, max.	60
28.	Radio Active Material: (e) Alpha emitters (f) Beta emitters	micro curie/ml, max	10^{-8} 10^{-7}

Note: These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution

2.2.3 Water Quality Standards

The Sri Lanka drinking water quality standards are provided below:

Table 2-4: Sri Lanka standard specification for potable Water (Sri Lanka Standards SLS 614: 2013)

Sl. No.	Parameter	Requirement
1.	Colour, Hazen Units, (max.)	15
2.	Odour	Unobjectionable
3.	Taste	Unobjectionable

Sl. No.	Parameter	Requirement
4.	Turbidity, (NTU) (Nephelometric Turbidity Units), (max.)	2
5.	pH at 25^{0} C + 2^{0} C	6.5 to 8.5
6.	Aluminium (as Al) (mg/l)	0.2
7.	Free ammonia (as NH_3) (mg/l) Albuminoid ammonia (mg/l)	0.06 0.15
8.	Anionic detergents (as MBAS (Methylene Blue Active Substances)) (mg/l)	0.2
9.	Calcium (as Ca) (mg/l)	100
10.	Chloride (as Cl^-) (mg/l)	250
11.	Chemical Oxygen Demand (COD) (mg/l)	10
12.	Copper (as Cu) (mg/l)	1.0
13.	Fluoride (as F^-) (mg/l)	1.0
14.	Free residual Chlorine (mg/l)	1
15.	Iron (as Fe) (mg/l)*	0.3
16.	Manganese (as Mn) (mg/l)*	0.1
17.	Magnesium (as Mg) (mg/l) **	30
18.	Nitrate (as NO_3^-) (mg/l)	50
19.	Nitrite (as NO_2^-) (mg/l)	3
20.	Nickel (as Ni) (mg/l)	0.02
21.	Oil and grease (mg/l)	0.2
22.	Phenolic compounds (as C_6H_5OH) (mg/l)	0.001
23.	Sodium (as Na) (mg/l)	200
24.	Sulphate (as SO_4^{2-}) (mg/l) **	250
25.	Total alkalinity (as $CaC0_3$) (mg/l)	200
26.	Total dissolved solids (mg/l), (max.)	500
27.	Total hardness (as $CaC0_3$) (mg/l)	250
28.	Total Phosphates (as PO_4^{3-}) (mg/l)	2.0
29.	Zinc (as Zn) (mg/l)	3.0
30.	Arsenic (as As) (mg/l)	0.01
31.	Cadmium (as Cd) (mg/l)	0.003
32.	Chromium (as Cr) (mg/l)	0.05
33.	Cyanide (as CN^-) (mg/l)	0.05
34.	Lead (as Pb) (mg/l)	0.01
35.	Mercury (as Hg) (mg/l)	0.001
36.	Selenium (as Se) (mg/l)	0.01
37.	*E.coli* /100ml or thermo-tolerant coliform /100ml	Not detected
38.	Total Coliforms / 100 ml	(i) Shall not exceed 3 in any 100 ml sample (ii) Not detected in any two consecutive samples

2.2.4 Noise standards

The National Environmental (Noise Control) Regulations No.1, 1996 specifies the industrial noise pollution standards. The maximum permissible noise levels (as $L_{Acq}T$) at the boundary of the land in which the source of noise is located shall not exceed the limits as given below:

Table 2-5: Permissible Noise Levels in Accordance with Noise Control Regulations

Area	LAcq T, dB(A)	
	Day time	Night Time
Low Noise (Pradeshiya Sabha area)	55	45
Medium Noise (Municipal Council/Urban Council area)	63	50
High Noise (EPZZ of BOI & Industrial Estates approved under part IVC of the NEA)	70	60
Silent Zone (100 m from the boundary of a courthouse, hospital, public library, school, zoo, sacred areas and areas set apart for recreation or environmental purposes)	50	45

Note:
*"**LAeq T**" means the equivalent continuous, A-weighted sound pressure determined over a time interval T (in dB).*
***"day time"** from 06.00 hours to 18.00 hours, except for the purposes of construction activities where it means 06.00 hours to 21.00 hours.*
***"night time"** means from 18.00 hours to 06.00 hours except for the purposes of construction activities where it means 21.00 hours to 06.00 hours.*

Maximum permissible noise levels at boundaries of the land in which the source of noise is located in LAeq T for construction activities are as given below:

Table 2-6: Maximum Permissible Noise Levels for Construction activities

Day Time	Night Time
75	50

As per the regulation, the following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in the above table.

(a) For low noise areas in which the background noise level exceed or is marginal to the given level	Measured Background Noise Level +3dB (A)
(b) For medium noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3dB (A)
(c) For silent zone in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3dB (A)
(d) For high noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +5dB (A)
(i) For day time	
(ii) For night time	

2.3 Asian Development Bank (ADB) Safeguard Principles and Policies

2.3.1 Safeguard Policy Statement (SPS), 2009

Built upon the three previous safeguard policies on the Involuntary Resettlement Policy (1995), the Policy on Indigenous Peoples (1998) and the Environment Policy (2002), the Safeguard Policy Statement was approved in 2009. The safeguard policies are operational policies that seek to avoid, minimize or mitigate adverse

environmental and social impacts including protecting the rights of those likely to be affected or marginalized by the developmental process. ADB's safeguard policy framework consists of three operational policies on the environment, indigenous peoples and involuntary resettlement.

The applicability of the project to the various safeguard principles and policies of ADB have been provided in Table below:

Table 2-7: Maximum Permissible Noise Levels for Construction activities

Sl. No.	Policy Requirement	Applicability
1.	***Safeguard Requirements 1 (Environmental Safeguard)*** This safeguard is meant to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision making process.	The proposed project will involve repair of various types of vessels and is likely to have significant environmental impacts during construction and operation phase. The impacts associated with the generation, use, storage, release, and/or disposal of pollutants have been assessed as part of this IEE. Measures for minimal release of waste/emissions, safe disposal of waste, waste water management etc. have been proposed for each project phase. The Environmental Safeguards are thus applicable to the proposed project.
2.	***Safeguard Requirements 2 (Involuntary Resettlement Safeguard)*** This safeguard has been placed in order to avoid involuntary resettlement whenever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre- project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.	The project is being developed within the existing Mutwal Harbour, on land owned by Ceylon Fishery Harbour Corporation. No additional land is being procured for the project. Hence, as no physical and economic displacement in terms of involuntary acquisition of land and involuntary restrictions on land use is triggered, the Involuntary Resettlement Safeguard is not applicable for the proposed project.
3.	***Safeguard Requirements 3 (Indigenous Peoples Safeguard)*** This safeguard looks at designing and implementing projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems and cultural uniqueness as defined by the Indigenous Peoples themselves so that they receive culturally appropriate social and economic benefits; do not suffer adverse impacts as a result of projects; and participate actively in projects that affect them.	The project area is being set up in an urban setting and through review of information available in the public domain it is noted that there are no presence of indigenous population residing within the vicinity of Colombo Fisheries Harbour area. No indigenous people or their territories are being directly or indirectly affected by the project activities. Hence the Indigenous Peoples Safeguard and the requirements there under are not applicable for this project.
4.	***Public Communications Policy 2011*** The Public Communications Policy (PCP) of ADB, originally formulated in 2005 and revised in 2011, is aimed at promoting improved access to information about ADB's operations related to funded projects. It endorses greater transparency and accountability to stakeholders involved in a project. The PCP establishes the disclosure requirements for documents and information related to projects. It mandates project-related documents normally produced during the project cycle to be posted on the web.	WCS will display its project related information on the company's website. Information on the website is to be made available in both English and local language. Grievance redressal procedure will be displayed at the project site.
5.	***Social Protection Strategy, 2001*** It requires projects to comply with the ILO requirements and give priority to identified vulnerable groups. Borrowers should take measures to ensure overall development of such groups.	The proposed project shall ensure that the requirements of the ADB's SPS are complied with. WCS shall comply with applicable labor laws in relation to the Project.

2.3.2 Categorization of Projects

As part of its review of a project's expected social and environmental impacts, ADB uses a classification system. This classification is used to reflect the significance of potential environmental impacts understood as a result of the client's impact assessment and to establish ADB's safeguard requirements. The categories used by ADB are:

- *Category A Projects*: Projects which are likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented.
- *Category B Projects*: Projects with potential adverse environmental impacts that are less in number, generally site-specific, mostly reversible and readily addressed through mitigation measures;
- *Category C Projects*: Projects with minimal or no adverse environmental impacts;
- *Category FI Projects*: Projects which involve investment of ADB funds to or through a financial investment.

Since the proposed project is a ship repair yard and is likely to have reversible impacts both in its construction and operation phase, that can be readily addressed through the proposed mitigation measures, the project is classified as a 'Category B' project as per the Bank's categorization system based on Environmental Safeguards. Categorization of the project as per Involuntary Resettlement and Indigenous Peoples is 'Category C'.

3.0 DESCRIPTION OF THE PROJECT

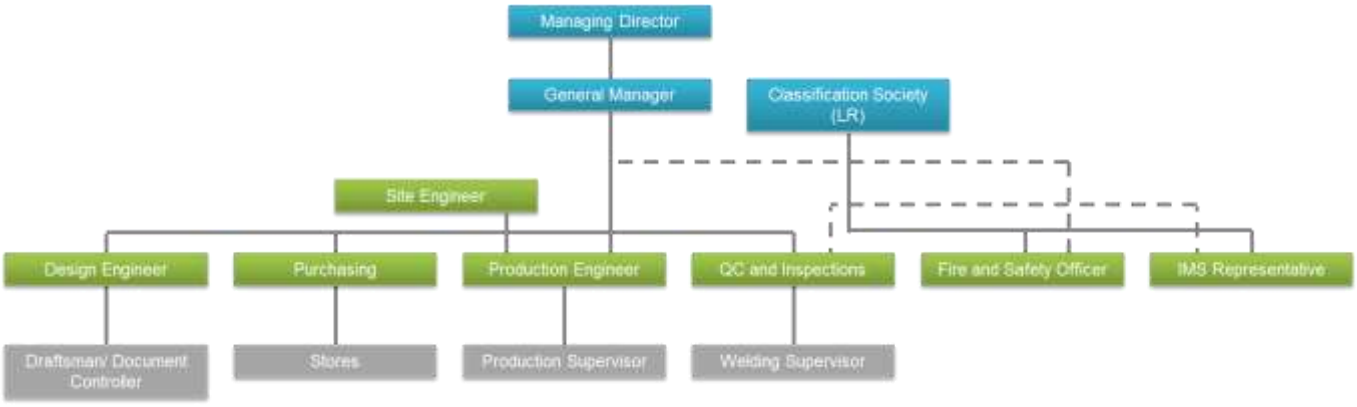
3.1 General Information of Company

The ship repair yard at Mutwal Fisheries Harbour, Colombo is being developed under Walkers Colombo Shipyard (Pvt.) Limited (WCS), which is a subsidiary of MTD Walkers PLC. The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., a ship repair and ship building entity that had entered into 25 year lease agreement with Ceylon Fishery Harbours Corporation to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015.

3.2 Organisation Structure

WCS is currently led by the CEO cum Managing Director who reports to the Board of Directors of MTD Walkers. The management at site is controlled and led by the General Manager. He is supported by a range of professionals across various departments such as Design Engineer, Production Engineer, Purchasing, Quality Control and Inspections. The Site Engineer of WCS is responsible for construction activities being undertaken at site. There is one Fire and Safety Officer at site who is responsible for ensuring safe practices at site, implementation of incident reporting system, work permit system and conducting training sessions and mock drills for construction phase employees and workers.

Figure 3-1: Current Organization Structure (Project Development Phase)



The various departments and the division of manpower for operation phase of the project is provided in **Table 3-1** below.

Table 3-1: Organizational Division of Manpower – Operation Phase

Division & Key Functions		Designation
Senior Management		MD/CEO
		DCEO
Operations Division	Ship repair, NBD Design & Construction	Head of Ship Repair, NBD Design & Construction
		Dock Master
		Ship Manager
		Engineer
		Design Engineer
		Workshop/Machinery/Onboard Operation Engineer
		Subcontracting to CWS
	Yard Operations, Yard Development & External Coordination	Head of Yard Operations
		Operations/Crane & Ancillary Equipment staff
		Maintenance Manager
		Maintenance staff

Division & Key Functions		Designation
Group Procurement	Service & Material, Procurement	Service Procurement Executive
		Material Procurement Executive
Commercial & Business Development Division	Commercial & Business Development (Ship repair & New Building)	Head of Commercial Business & Development (Ship Repair & New Building)
		Scheduling & fleet relationship team
		Descriptor
		Data Entering/Research Analyst
		Marketing & Estimation
		Invoicing Executive
		New Building Project Development Manager
Group Finance	Finance reporting	Accountant/ Assistant Accountant
		Cashier
Group Human Capital and Administration Division	HR & Administration	HR & Admin Manager
		Admin & Security Officer
		Personal Files & Salary Administration
Group Safety & Compliance Division	Safety & Compliance	Quality Controller
		Safety, Environmental & Fire Officer
		Fire Protection Staff
	Technical & Coordination	Engineer
		Management Accountant
		R & D Officer

3.3 Project Location and Site Settings

The Colombo shipyard is located in Colombo Division in Colombo District of the Western Province of Sri Lanka. The shipyard is situated within Mutwal Fishery Harbour, adjacent to the Colombo Port towards south west. The Mutwal Fishery Harbour is an existing harbour owned and managed by the Ceylon Fishery Harbours Corporation. The harbour provides berthing facilities for local and foreign fishing vessels.

The Colombo Port is situated at an aerial distance of 3 km from the proposed ship yard, towards south west. Several small houses belonging to the fishing community are situated immediately north of the site. There are few settlements immediately east of the site at about 200 m from the harbour boundary.

Figure 3-2: Indicative Location of Project

3.4 Proposed Facilities

WCS proposes to develop ship building and ship repair facilities at the Colombo shipyard, for vessels such as naval vessels (up to 65 m), fishing vessels, landing crafts, passenger vessels, works vessels and barges. Development works are under progress to provide floating repair services up to 80 m length vessels and dry berth repair services up to 42 m length vessels. The repair services will comprise engine repairs, hull renewal, electrical repairs, underwater repairs, maintenance of piping, maintenance and repair of on-board refrigeration and air-conditioning systems, propellers, rudders and shafts. WCS will also undertake design and building of new vessels (small and medium crafts) at the shipyard, including Naval Vessels, Landing crafts, Tug Boats, Anchor Handlers, Work Vessels and Passenger Vessels.

As per the Yard Capacity Plan, dated 8th September 2015, shared by WCS, the Colombo shipyard will comprise of following facilities as described below.

Ship lifting and Transfer System

A ship lifting and transfer system of 1250 Tons capacity is being developed at the ship yard for dry repair of vessels. The total winch lifting capacity of the system will be 1900 Tons. The net lifting capacity will be 1600 tons and the nominal lifting capacity for platform will be 1300 tons. The lift and transfer system will consist of a platform with dimensions - 52 m length, 14.5 m width and average height of 1.25 m. The platform will be equipped with about eight (8) sets of winches, each with a maximum capacity of 240 tons. The ship lift system will be designed, manufactured, constructed and commissioned under Classification Society Rules.

The system will have capacity to lift vessels of up to 130,000 DWT. The repair pier can accommodate vessels of up to 42 m in length and up to seven (7) vessels can be repaired at any one point of time.

Boat lift and Slip way

For repair of small vessels and fishing boats, a boat lift with 50 Ton capacity will be developed along the existing breakwater. A slip way will be developed on the south east corner of the site, near the breakwater for facilitating the repair of small vessels.

Floating repair areas and Workshop

The northern end of the existing pier of the Fishery Corporation will be repaired and redeveloped to be used as area for floating repairs of large and medium vessels. The shipyard will provide floating repair services for vessels up to 80 m in length. A covered workshop will be constructed towards the south eastern end of the site.

Worker Accommodation and Office building

About 200 workers will be engaged for ship repair and building activities once the ship yard is fully operational. Accommodation will be provided to the workers at site. WCS has installed container units at site which are currently being used by the contractors as office space and also has canteen and toilet facilities for the construction workers. These container units will later be converted into accommodation and office for operation phase employees and workers.

The operational shipyard will have one security room at the main entry gate and two guard posts at the northern end of the pier to ensure round the clock security.

3.5 Support Facility – Central Workshop

The Central Workshop under the Walkers and Sons Engineers (Pvt) Ltd is located at Sapugaskanda in Colombo Division, Colombo District of the Western Province of Sri Lanka. Plate and fabrication works related to construction of pressure vessels, and general fabrication work of machine components, radial gates for hydro projects and segments for tank farms are undertaken at the workshop. The standard product lines comprise of tea, rubber and sugarcane processing machinery. The Central Workshop will be a support facility to the shipyard as repair and maintenance works of vessels which involve general fabrication will be undertaken at the workshop. The workshop also caters to other customers from the tea, rubber and sugarcane processing industries.

The company has plans to shift the Central Workshop to an industrial area in Delkanda, owned by the State Engineering Corporation (SEC). The land within the SEC premises will be taken on lease by WCS. The process of entering into lease agreement is under progress. Work orders for structural works have been issued to contractors by WCS. Due to permission related issues, the land allocated for the workshop could not be surveyed as part of the assessment. The workshop relocation is expected to be complete by April 2017.

The workshop is fully equipped with various equipment and machinery ranging such as lathe machines, machines for plasma and flame cutting, shot blasting, milling, slotting, thread cutting, shaping, boring, rolling, drilling, sheering, hydraulic press, circular grinder, planer machine and sheer cutter. The workshop also has various sections such as cutting bay, prep and tacking section, lay-down and QA inspection area, completed spool storage with mobile crane facility, training centre and skills testing facility, and division for fabrication and assembly. In addition, the workshop consists of separate welding consumable store, materials control store, shop testing facilities, various welding machines and equipment, cutting and prep equipment, tea machines making machinery, arc welding plant (Nos 4), tig welding plant, stationary grinding machines (Nos 3). The workshop also has one overhead crane of 5 Tons capacity and one Mobile Crane of 5 Tons capacity.

Layout and capacity plan of the Colombo ship yard is presented in **Figure 3-3**.

3.6 Working Principle

The Ship Lift platform will be lowered and raised by hoists, driven by modular designed winches. The Electric/Electronic controlled double wire winches will be secured by triple break system. The winches will be driven by independent motors allowing continues seamless operations even if a single motor fails. The ship lift system will be operated by wire or a wireless remote control system.

The transfer system will consist of rail transporters and trestles. For docking a vessel, the trestles will be placed onto the platform with appropriate wood block to avoid any harm between trestles and the hull. The trestles will be arranged according to the docking plan, depending on the load curve. Tug boats will be used for mooring the vessel onto the submerged platform with trestle. The lift system will be activated and after lifting the vessel, the rail transporters will be driven under the trestles and the ship will be transferred to the repair pier. The launching system will also work in similar manner. The entire system will be remotely monitored and operated from the control room.

3.7 Resource Requirements – Operation Phase

The various resources required during the operation phase activities of the Project are as provided in **Table 3-2** below:

Table 3-2: Operation Phase Resource Requirement

Sl. No.	Resource	Details
1.	Water	▪ *Uses:* Domestic usage will be limited to cooking, drinking, washing and flushing purposes while during vessel maintenance/ repair, water will also be required for cleaning of vessel hull and inner compartments, hydro blasting, etc. ▪ *Permitted Quantity:* 20,000 litres per day ▪ *Estimated quantity:* 10,000 litres per day for hydro blasting activities and 10,000 litres per day for domestic usages ▪ *Source:* Water supplied from Water Supply and Drainage Board, Municipal Council of Colombo
2.	Power	▪ *Estimated requirement*: About 1.0 MW of power will be required for the operations. ▪ *Source:* Power will be sourced from the grid (Ceylon Electricity Board) through transformers and low tension power cables.
3.	Labour	About 200 workers will be engaged for ship repair and building activities once the ship yard is fully operational. Skilled staff will include - docking staff, pump operators, sponge jet blasting operators, machinists, lathe workers, fabricators, welders, electricians and housekeeping staff. Most of the skilled staff will be engaged through manpower supplying agencies. WCS will also have its own permanent employees comprising of dock master, engineers, maintenance managers, procurement executives, finance, HR and administration personnel.

Figure 3-3: Layout of the Colombo Ship yard

3.8 Project Development

The construction phase of the proposed Project will involve procurement of raw materials and equipment, construction of slip way, installation of ship lift, civil works for associated buildings, construction of roads and drainage structures, welding/cutting onsite, installation of pumps and mechanical and electrical installations. The construction works will also entail piling and dredging works. This sub section describes the various aspects involved in the construction phase of the project, along with the project development schedule.

3.8.1 Project Schedule

The construction activities for redevelopment of Colombo Shipyard have been initiated by WCS and it is expected to be completed by January 2017.

3.8.2 Piling and Dredging

The Mutwal Harbour was equipped only to handle small fishing vessels. The existing draft at the harbour is about 4 – 6 m. Therefore in order to accommodate larger vessels, capital dredging activities up to 8 m depth is required to be undertaken in the berthing area. Dredging works will be carried out by the Ceylon Fishery Harbour Corporation (CFHC), which has the exclusive mandate of undertaking dredging at harbours in Sri Lanka. It is proposed that 'Sayuru', which is a self-propelled grab hopper dredger owned by CFHC, will be used for the dredging activity. CFHC is also the licensing authority for disposal of extracts. The dredged material will be disposed at permissible areas beyond 5 nautical miles (nm) from the harbour limits as per the permit issued by MEPA to CFHC[5]. The boulders in the dredged material will be reused by MTD Walkers for construction works, mainly for filling low lying areas. Maintenance dredging will also be carried out by CFHC periodically to improve navigation.

The construction activities will also involve piling works wherein concrete piles will be inserted into the seabed for providing foundation for lifting platform. The piling activity will be undertaken by M/s Walkers Piling (Pvt) Ltd., which is a group company of MTD Walkers. WCS has engaged Sri Lanka Land Reclamation and Development Corporation to dispose piling extracts in government permitted areas. The nearest filling yard for disposal of piling extracts is at Muthurajawela Zonal, near Shell terminal.

Photo 1: View of Dredger and Piling Equipment

3.8.3 Resource Requirements – Construction Phase

The various resources required during the construction phase of the Project are as provided in **Table 3-3** below:

[5] Sub-sec 7(1), under Section (I) of Marine Pollution Prevention Act, No. 35 of 2008, the Marine Environmental Protection Authority (MEPA) shall specify the location of dumping sites in every permit issued for dumping of dredged material. Schedule II of the Act provides the sediment quality guideline for dredged material proposed for dumping at sea.

Table 3-3: Construction Phase Resource Requirement

Sl. No.	Resource	Details
1.	Water	Water will primarily be used for construction activities, drinking purpose and in toilets by construction workers and site employees. About 10,000 litres per day of water will be used for domestic use at site, sourced from Water Supply and Drainage Board, Municipal Council of Colombo.
2.	Power	The power requirement during development of the shipyard will be limited to activities such as cutting, welding, fabrication, forging, grinding, drilling, etc. Since the shipyard is located within the Mutwal Harbour premises, existing power connection will be used.
3.	Labour	The construction phase manpower requirement is estimated to be about 200 workers. The workforce will primarily comprise of qualified welders, fabricators, electricians, mechanics, steel workers, concrete workers and helpers. The workers will be mostly locals from nearby areas. The project does not require setting up of labour camps during the construction phase of the project. All construction workers will be engaged by WCS through contractors
4.	Land	As per the lease agreement between Ceylon Fishery Harbours Corporation and Sea Gulf UK (Pvt.) Ltd., dated 14th November 2014, the ship repair yard is being developed on land marked Lot 1 situated within the premises of Mutwal Fishery Harbour. No additional land has been procured or is required to be procured for the project. The Fishery harbour owns a cold storage that is located adjacent to the project premises. WCS proposes to use the cold storage unit however no formal arrangement has yet been executed between WCS and Fishery Harbour Corporation.

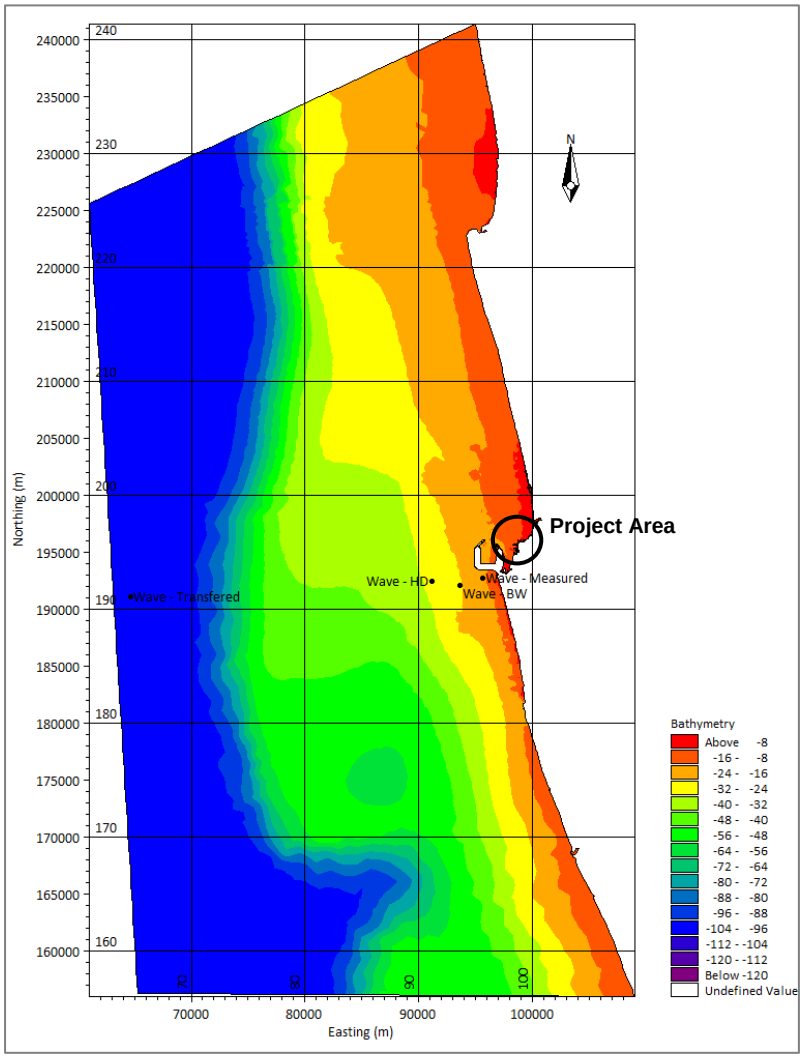
4.0 DESCRIPTION OF BASELINE ENVIRONMENT

4.1 Physical Environment

4.1.1 Bathymetry

Secondary sources suggest that the average water depth in the immediate vicinity of the project site ranges from 0 - 16 m. The bathymetry of the area around the Colombo Port including project site is shown in **Figure 4-1** below.

Figure 4-1: Bathymetry around Project site



Source: SEIA Report – Proposed Colombo Port City Development Project - December 2015

4.1.2 Oceanography

Salinity

Secondary studies suggest that the annual mean surface salinity of the region varies from 34 - 34.5 psu. The minimum and maximum salinities are observed during the November and October respectively. Surface salinity gradually increases as one move away from the coast. With depth salinity strongly increases up to the depth of two meters and thereafter remains almost constant.

Sea Surface Temperature

The annual mean surface temperature of the region is 28.7°C. The mean temperature varies from 27.5°C to 29.5°C. The low temperatures are observed during the southwest and northeast monsoon, while the First (April) and Second inter monsoon (October) results in warmer water. The average surface and bottom temperatures are 30.9°C and 29.6°C respectively. With depth temperature slightly decreases up to the depth of two meters and remains constant beyond. The daily water temperature variation recorded in the study area is 1.13°C only, which indicates the water is well circulated in the area.

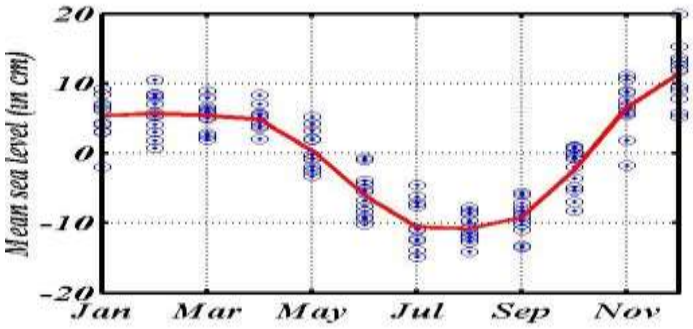
Chlorophyll distribution

Chlorophyll concentration in the water in project area varies between 2-10 mg/m^3. Highest Chlorophyll values are recorded from the seaward side while the lowest values were recorded from landward side.

Sea level

Seasonal sea level variations occur due to salinity and temperature variations, which cause expansion and contraction of the upper ocean. Below **Figure 4-2** shows mean annual sea level variation at Colombo. The variation reaches up to 20 cm. Higher and lower sea levels are observed during the December and July respectively. Storms may cause a limited set up on the narrow continental shelf, resulting in an additional rise of 30 cm in extreme cases.

Figure 4-2: Monthly mean sea level



Source: PSMSL for the years 1934-35, 1979, 1954-62 and 1990-91

Tides

Tide in the project area is semi-diurnal, i.e. there are two high and two low waters on each lunar day (24.84 hrs). The mean tidal range is 40 cm, spring tidal range is 60 cm while neap tidal range is 12 cm.

Water current

In the project area, the current velocity is stronger during the South-West monsoon (May to July) than that of North-East monsoon (November - January). The maximum current observed in the area during the South-West monsoon (SWM) is 27.5 cm/s, the minimum current is 12.5 cm/s. Tidal currents are observed over the entire depth. These vary with predominate period being a half day. The maximum tidal current velocities are between 2 - 15 cm/s in the north-south direction and 2 - 5 cm/s in the east-west direction. The magnitude of the wind induced currents varies from 2 - 10 cm/s. The predominant direction of the current is north. The region around the northern Indian Ocean including the Sri Lankan waters is predominantly influenced by seasonally reversing monsoon winds and upwelling pattern of current circulation.

4.1.3 Coastal Morphology and Drainage Pattern

About 2 km north of the project site is the outfall point of River Kelani. Studies on erosion pattern in the area north of Colombo Port suggest that the shoreline between the Colombo South Port and the Kelani River have remained stable after construction of the Colombo South Port. This is mainly because of sediment supply from Kelani River. The Kelani River is believed to contribute some 100,000 - 200,000 m^3/year to the sediment budget of the area based on studies conducted by the CEA and CCD as part of Coastal Resources Management Project

(1999). Other studies[6] indicate that the net long-shore sediment transport in the area is predominantly toward the north as a result of the wave climate (South west monsoon sea waves and swell). However, during the North east monsoon, the sediment transport (as a result of waves from northwest) is sometimes to the south. The net movement across the Colombo Port South Harbour has been estimated at 250,000 m^3 /year.

The Project is located within the existing port wherein the coastal area is already modified with existing structures. Exposure of coastal area to the project activities is limited. The development of the project is therefore not likely to contribute to coastal erosion in the area considering the limited rate of erosion and sufficient rate of sedimentation from the Kelani River.

4.1.4 Climatology

The rainfall pattern in Sri Lanka is characterized by two tropical monsoons, southwest monsoon from May to September and northeast monsoon from December to February. There are two inter-monsoon periods between the two monsoons. As per Department of Meteorology, the monthly rainfall experienced in the Colombo district for the period 2011 - 2013 has been presented in **Table 4-1** below. The driest months in the district are in December and January. The district experiences good rainfall for remaining part of the year, April to July receiving maximum rainfall in southwest monsoon. The total annual rainfall is normally in the range of 1500 – 2500 mm.

Table 4-1: Monthly Rainfall in Colombo district, 2011- 2013

Month	Rainfall in mm		
	2011	2012	2013
January	61.7	158.7	90.9
February	33.7	140.1	164.3
March	149.5	122	108.3
April	354.3	532.3	148.1
May	197.8	152	404.5
June	178.6	88.6	260.4
July	98.2	41.1	198.2
August	148.6	200.3	21.8
September	76.2	180	216.8
October	242	507.3	140.3
November	188.3	207.4	204.7
December	45.3	134.8	32.3

Source: Dept. of Meteorology, Sri Lanka

Similarly, the temperature data for the period 2011- 2013 shows that maximum temperature in the district ranges from 30.6 – 31°C while minimum temperature ranges from 24.9 – 25.9°C. The months of February to May are the hottest months of the year while December and January are the coldest.

Table 4-2: Maximum and Minimum Temperature (°C) in Colombo district, 2011- 2013

Months	2011		2012		2013	
	Max	Min	Max	Min	Max	Min
January	29.9	32.2	30.8	22.8	31.2	23.3
February	30	24	31.7	23.4	31.5	23.8
March	31.7	24.7	31.5	25	31.9	25.1
April	31	24.9	31.3	24.5	32.4	26.4
May	31.3	26.7	31.7	26.7	31.1	26.8
June	30.8	26.4	30.8	26.5	30	25.6

[6] EIA for Proposed Colombo Port South Harbor Development Project, 2006 (https://www.adb.org/sites/default/files/project-document/67057/39431-sri-seia.pdf)

Months	2011		2012		2013	
	Max	Min	Max	Min	Max	Min
July	30.2	26.2	30.6	26.5	30	25.6
August	30.2	26.2	30.7	25.5	30.1	25.9
September	30.5	26.1	30.4	25.6	30	25.3
October	31	25.2	30.8	24.5	30.5	25.5
November	30.8	24.3	31	24	30.9	24.3
December	30.5	23.6	30.7	23.9	31.1	23.8

Source: Dept. of Meteorology, Sri Lanka

4.1.5 Ambient Air Quality

Ambient air quality is routinely monitored in Colombo by CEA who operate a network of ambient air monitoring stations. Air quality measurements have been carried out at the vicinity of the Colombo Port on October 2014 and February 2015 by the National Building Research Organization (NBRO). Sampling locations include Sri Lanka Port Authority (SLPA) office on Galle Face, Museum and Chaithya of SLPA, inside the Colombo Port, and within the premises of old parliament building. All the locations are situated within 5 km radius of the Colombo Port. Results indicate that ambient air quality levels in the area are within the standards stipulated by CEA. Following values have been recorded in the area:

Table 4-3: Ambient Air Quality near Project Area

Parameter	Sampling time	Concentration (µg/ m^3)		National AAQ Standard (µg/ m^3)
		Oct 2014	Feb 2015	
SO_2	1 hrs	50	57	200
NO_2	1 hrs	52	58	250
CO	1 hrs	5000	4500	10,000 (8 hourly)
PM 10	24 hrs	57	30	100

Source: SEIA Report – Proposed Colombo Port City Development Project - December 2015

4.2 Biological Environment

The marine areas near the Project area have several submerged reefs, such as Palagala reef and Vatiya reef, though covered with fine sediments. The reefs are located more than 1 km from the project site. The reefs consist mostly of soft corals, the most abundant organisms being gorgonian corals followed by dendronephthyan corals. However none of the coral species reported from the area is endemic or included in the national threatened list (MOE 2012) or restricted export category (Gazettes Nos. 1036/3 of July 1998 and 1098/3 of September 1999). The most abundant species of reef fish reported from the area is damselfish (Family: Pomacentridae). The commercially important food fishes include snappers, tevallies, emperors, groupers, barracudas and sweet lips. None of the fish species reported are listed as threatened species (MOE 2012).

Several reefs are found more than 1 km north of the project site that can be categorized as nearshore reefs and offshore reefs. Some of the reef dwelling species reported from the area include *Cephalopholis formosa*, *Ecsenius bicolor* and Pempherisanalis. Macrozoobenthos found in the area, which are a food resource for a large number of predators, benthic fish and some aquatic insects, mainly represent five major phyla of Mollusca, Annelida, Arthropoda, Retaria and Chordata. The sandy substrate mostly consists of high density of bivales belonging to families of Veneridae, Cardiidae, Mactridae, Arcidae and Tellinidae. Apart from coral reefs, no other coastal habitats such as mangroves are found within or near the project area.

Sri Lanka's territorial waters are also rich in marine mammal fauna with high species richness and year round abundance. However very limited information is available about mammalian fauna in the west coast due to lack of research. No dolphins or whales are reported from the study area, though few might be encountered occasionally due to seasonal migrations. Studies conducted on dolphin encountered in the offshore large pelagic fish catches in the west coast revealed that spinner dolphin was encountered in gillnets in the area (Dayaratne and Joseph, 1993). However their sighting and occurrence is rare and unpredictable.

In Sri Lanka, five of the most threatened species of sea turtles; loggerhead (*Carettacaretta*), green turtle (*Cheloniamydas*), hawksbill (*Eretmochelys imbricata*), olive ridley (*Lepidochelysolivacea*), and leatherback (*Dermochelyscoriacea*) are reported. It is reported that some occurrence of olive ridley and green turtles are encountered off west coast.

The project area, i.e. up to 5 km radius around the Mutwal harbour supports a variety of fishery resources mainly pelagic species, both finfish and non-finfish. The most important small pelagic fish species belongs to family *Clupeidae* and *Engraulidae*. The recorded species and habitats in the area are of low ecological value.

4.3 Socio-economic Environment

The total urban population of the Colombo D.S. Division[7], under Colombo District, was recorded to be 323,257 for the year 2013[8] (Source: District Statistical Handbook), which is about 13.9% of the total population of the District. The population density was 180 persons per hectare. Out of the total population in the Colombo DS Division, 50.3% comprise males and 49.3% comprise female population. The sex ratio of the DS Division is 1.01 (number of males per 100 females).

Fishing is predominantly carried out in the open marine waters north of the Kelani River and in the Onagala area. There is one fishing ground, Modera, about 1.5 km north of the Project site. As per the Statistical Unit of the Ministry of Fisheries and Aquatic Resources, about 148 fishing fleets operate in Modera and the total fish production in 2014 was about 1526.8 MTs per annum. Several types of fishing gear such as gill nets, drifting trammel nets and mechanized trawlers are used. Three categories of fishing crafts are operational in the area – namely Fiber Reinforced Plastic Boats (OFRP), Non-mechanized Traditional Boat (NTRB) and Beach Seine Boat (NBSB). The fish production is based on the type of fishing craft, with NBSB having highest quantity of catch in the range of 2000 kg/ month followed by OFRP at about 600 kg/ month and NTRB having about 300 kg/month of fish catch. There are specific seasons for operating specific types of fishing vessels, however trawling is carried out throughout the year. The Mutwal Fishery Harbour is a fishing vessel berthing area and there are few anchorage/ fish landing sites nearby. However no significant impacts on the activities at these sites are anticipated in view of the Proposed project as the fishing grounds are located at significant distance from the project site.

The Colombo city has its own unique colonial history. The Fort and Pettah are two distinct areas in Colombo city. Colombo Fort has been declared a special area because of the many historic buildings that come under the Urban Development Authority. The Project will not directly affect buildings of heritage interest in Colombo City. No culturally important or archaeologically significant areas will be impacted due to development of the shipyard as it will be situated within the already existing Mutwal Harbour.

[7] Colombo District is divided into 13 Divisional Secretary's Division (DS Divisions), each headed by a Divisional Secretary.
[8] Source: District Statistical Handbook

5.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 Pre-Construction Stage Impacts and Mitigation Measures

Pre-construction stage of the project involves activities such as site selection, land procurement for the proposed facilities etc. It can have wide ranging but limited impacts owing to the scale of project facility on land, soil, water resources, flora and fauna, and socio-economic environment.

As discussed earlier, the Project is being set up within the existing Mutwal Fishery Harbour area (approx. 2 hectares). The land has been obtained on lease from the Ceylon Fisheries Harbours Corporation. No additional land has been procured or will be procured for the Project. Thus the land procurement does not involve any involuntary resettlement or loss of livelihood. Site preparation does not involve extensive clearing or removal of vegetation. Hence, environmental impacts due to clearing of vegetation are anticipated to be negligible. No endangered fauna species exist in the area. Thus, there will not be any impacts on terrestrial flora and fauna.

5.2 Construction Stage Impacts and Mitigation Measures

The construction phase impacts of the project have been described further in this section and mitigation measures have been proposed for such impacts.

5.2.1 Impacts on Marine Ecology

Construction activities which are likely to impact the marine ecology of the area include dredging and piling works. The dredging activities can lead to potential siltation. The construction works will require about 200 workers at site, which will generate sewage and domestic waste requiring adequate disposal. The construction activities will also generate noise coupled with intermittent loud peaks associated with forging and fabrication of metal sheets and vibration due to piling works.

The sediment to be removed by dredging will consist of mixed sediments with varying levels of sands and silts. The area is characterized by presence of macro zoo benthic organisms representing phyla – Mollusca, Annelida, Arthropoda, Chordata, Retaria and Echinodermata. The macro benthos generally found in the western coastal waters of Sri Lanka include crustaceans such as spiny lobsters, crabs, isopods, caprellids, hermit crabs, polychaetes such as sabellids, nereids, capitellids and spionids, echinoderms such as sea cucumbers, sand dollars, star fishes, sea urchins and brittle stars and molluscs such as bivalves and gastropods. None of these species is included in the IUCN list of threatened species (MOE 2012) or in the restricted export category. Although dredging will cause the complete removal of all benthic communities present within the area of the proposed dredging works, the community should begin to re-establish itself almost immediately after the cessation of the dredging. Dredging can give rise to sediment blooms with high levels of suspended solids, especially close in to the dredger head. However, the project related dredging will be limited only to construction phase for short duration and is not expected to significantly increase the levels of siltation and adversely affect the aquatic biota. The coral reefs are located at considerable distance (more than 1 km) from project site and consist primarily of soft corals. Due to the distance of the project site from the reefs and low ecological value of the species reported from the vicinity of the project site, the project activities are not likely to impact the marine ecology in any significant manner.

Similarly piling activities will generate noise and vibration that can have adverse impacts on the marine fauna such as fishes. However the harbor area, also being closer to the Colombo Port, is already exposed to various noise generating activities of man-made nature, it is expected that fishes have adapted in such an environment. It is also to be noted that piling will be a short term activity. Runoff from the construction area such as debris, as well as disposal of sewage from toilets provided in construction areas can lead to deterioration of the marine water quality.

The dredged material and piling extracts are being utilized for filling low lying areas as discussed in ***Section 3.8.2***. Toilets provided at site for construction workers and employees are connected to septic tank. The construction area will be bunded and provided with adequate drainage with silt traps to prevent runoff from

construction area into the marine waters. Construction workers will be instructed about no disposal or dumping of any kind of waste into the marine waters and waste storage bins will be provided at conspicuous locations. During piling activities, soft start procedures will be adopted (i.e. commencing with reduced noise level to allow fishes to move away from the area before increasing the noise levels gradually).

5.2.2 Impacts on Water and Sediment Quality

About 20 KL of water will be required daily for the construction activities and will be sourced from public water supply system. About 6-8 KLD of domestic wastewater will be generated during construction phase. The marine area around the dredge site may experience a temporary increase in sediment levels during the dredging operations, which will quickly revert back to normal levels. Waves and current action lead to erosion at the edges of the site and results in runoff, however there will not be any additional erosion due to the construction activities. Use of machinery and equipment will require storage of materials such as fuels and other chemicals at site, which can lead to contamination of groundwater and marine water and sediment through improper transport, storage or handling. All storage facilities will be designed with paved surface, provided with covered shed and adequate containment facility at the construction site to prevent any runoffs into the sea and contamination due to accidental spills of lubricating oil, fuel oil, paints, thinner, varnishes, chemicals etc.

Inadequate disposal of sewage can lead to further deterioration of water quality, resulting in high BOD and nutrient levels along the shoreline. However the toilets will be connected to septic tanks and construction workers will not be allowed to dispose any kind of waste into the marine waters. All the debris resulting from construction activities will be removed from the site and transported to designated areas, on regular basis to prevent any runoff.

5.2.3 Impacts on Ambient Noise Quality

Noise generation during construction phase will be primarily from operation of construction machinery and equipment such as generators, compressor, pumps, pneumatic tools, vibrators, concrete mixers, cranes and piling machine. There are residential areas immediately east of the site at a distance of about 200 m from the harbour boundary. High noise levels will create disturbance to the habitations and the impact can lead to sleep disorders if the night time noise levels are very high. Workers working close to high noise areas can be exposed to occupational hazards of noise which could lead to loss of hearing. Piling works will generate noise and vibration depending upon the size of the pile being installed and the pile driving method used. The project will involve vibro-driving, where rotating eccentric weights create an alternating force on the pile, vibrating it into the ground. This activity will be for a limited duration and is expected to be completed over a period of 3-4 months.

The project will ensure adequate planning to avoid high noise activities. Wherever it is unavoidable, acoustic enclosures and noise barriers will be provided in areas of high noise generating sources (such as generators, compressors, forging, cutting etc.). High noise activities will be avoided during the night time. Construction workers engaged in high noise generating activities will be provided with ear muffs. Noise absorbers and dampeners will be provided for each high noise generating activity.

5.2.4 Impacts on Ambient Air Quality

Project related construction activities are likely to add on to the existing PM and dust levels in the area. The potential sources of air pollution include fugitive dust emissions from construction activities, emissions from onsite operation of diesel generators, construction equipment and improper handling and storage of construction material leading to dust dispersion during high wind periods.

Diesel generators will be regularly maintained so as to ensure that emissions from fuel combustion remain at design levels. Proper maintenance will be undertaken for all machines and equipment used at site. Vehicles and vessels engaged for transportation of friable construction materials and spoil will be covered. Fugitive dust emissions will be suppressed through daily sprinkling of water within construction area and proper location of material stockpiles, especially sand and soil downwind from the habitations.

5.2.5 Traffic and Transport related Impacts

Transportation of machinery and construction supplies/materials using shipping vessels and through roads will result in additional traffic, temporarily around the project site. Additional transportation may lead to congestion of the navigation channel during peak hours as the site is close to the Port area. Spill and leaks from poorly maintained boats /vessels may lead to contamination of water and sediments.

WCS will ensure that all vessel movement is undertaken as per the guidelines /norms laid down by the Sri Lanka Port Authority for the Colombo Port Area. All unwanted movement of vessels will be avoided. Necessary training will be imparted to the operators of construction vessels and drivers of construction vehicles for speed restrictions to ensure safe operations.

5.2.6 Impacts on Socio-economics

The workforce will primarily comprise of skilled workers. The construction works will involve local labour and influx of migrant workers is not envisaged. Labour camps will not be set up for the project. Moreover the project is located in an urban set up. The interaction between the workforce and community will therefore be limited. A positive impact through increase in livelihood opportunities from involvement in construction activities such as obtaining construction contract, renting machinery, providing construction machinery etc. is however expected.

WCS will implement a grievance redressal mechanism for the community wherein any of the surrounding community members can raise complaints related to construction activities. Adequate number of guards will be deployed at the site to ensure proper security arrangements. The guards will be adequately trained on dealing with workers and communities as well as use of force.

5.2.7 Occupational Health and Safety related Impacts

The construction phase will have associated occupational health and safety impacts. The most common causes of injuries in construction are over exertion, ergonomic injuries, slips and falls on the same elevation associated with poor housekeeping, injuries associated with working at heights (ladders, scaffolding, and partially built or demolished structures), moving machinery and exposure to hazardous materials, hot jobs and electrical works.

Occupational health and safety impacts can be mitigated through implementation of adequate health and safety measures. Workers will be trained on lifting and materials handling techniques. Good house-keeping practices will be implemented at site. Temporary fall prevention devices will be provided at necessary places and workers will be trained on use of personal fall arrest systems. Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes will be made mandatory. Specific PPEs such as respirators, clothing/protective suits, gloves and eye protection will be made available to workers engaged in specific jobs. A work permit system will be adopted wherein only trained workers equipped with necessary PPEs will be permitted to undertake hot jobs and electrical works.

5.3 Operation Stage Impacts and Mitigation Measures

The environmental impacts during operation phase are broadly covered in below sections.

5.3.1 Impacts on Water Resources, Marine Water and Sediment Quality

During operation phase, the routine (daily) requirement of water will be limited to drinking and flushing purposes only by the facility staff and workers. However when a vessel will be under maintenance/ repair, water will be required for domestic purposes, cleaning of vessel hull and inner compartments of the vessels, hydro blasting, etc. Wastewater will be generated as part of the overall operations and will need to be adequately managed to avoid any adverse impacts on the marine water quality. The primary wastewater streams during operation phase will be domestic sewage generation, oily bilge water and contaminated ballast water from vessels. The water requirement will be met through Municipal water supply. About 20,000 litres per day of water is already sanctioned for the shipyard. Maximum water requirement will be during peaking operations only.

As explained in Section 4.1.3, the net sediment movement across the Colombo Port area has been estimated at 250,000 m^3 /year. Modelling studies conducted for the project area[9] indicate that the annual rate of deposition in the area is about 24 mm. The establishment of the shipyard may alter the localized sedimentation pattern of the marine area around or in immediate vicinity of the project which could lead to minor changes in bathymetry thus affecting the navigation. However during operation of the shipyard, sedimentation is not expected to be significant. There will not be any significant additional impacts as the area was an existing harbour and is close to the Port.

The potential impacts on the water and sediment quality are as provided below:

- Wastewaters and storm water runoff from the shipyard may contain elevated concentrations of a variety of constituents that, under certain conditions, may be adverse to the beneficial uses of the receiving water for the discharge/runoff.
- There are a variety of activities associated with vessels that could contribute trace metals including antifouling paint hull coatings, sacrificial anodes, motor exhaust, and hazardous material spills. Antifouling bottom paints are amongst the largest source of trace metals, in particular copper.
- Vessels that come in for repair and maintenance generally carry bilge and contaminated ballast water that needs to be disposed of properly. Potentially oily bilge and ballast water can lead to contamination of marine water and sediments. Non-contact cooling water, black and gray waste water (sanitary wastewater) also require appropriate management.
- Other pollutants generated during vessel maintenance and repair works include blast abrasives, paint, paper trash, discarded construction materials, sediment, marine growth, oil, solvents, and plastics which are hazardous in nature and if not disposed adequately could lead to contamination of marine water and sediments.
- Maintenance dredging will also be undertaken at the site on regular basis. The dredged material will be used for filling low lying areas. Dredging activity will result in temporary disturbance to the dredged area, leading to a marginal increase in turbidity around the area of activity. During dredging operation, surface water may also be contaminated due to spillage of oil, grease, machine oil, etc. from the dredging equipment. Unplanned dredging may also lead to erosion at some places.

Following mitigation measures will be implemented by WCS at the shipyard to ensure minimal adverse impacts on the water resources, marine water and sediment quality:

- WCS will ensure efficient use of water during operations. All workers will be trained on significance of water conservation to minimize the stress on resources due to project operations.
- Septic tank along with soak pits will be provided at the facility for treating the sewage generated. Provision of septic tanks and soak-pit disposal arrangements will be as per standard designs.
- Approximately 50 - 100 m^3 of water per day after washing with high pressure will be collected into the tanks/ pits of the repair berths and will be pumped into effluent treatment facility. The repair facility will be fully equipped with weirs and channels for collection of all effluent without any spill.
- Bilge and contaminated ballast water will not be discharged from the facility. In case bilge and ballast is required to be collected, will be collected in a temporary holding tank or vessel and connected to the effluent treatment system prior to discharge into sea[10].
- An Effluent Treatment Plant (ETP) will be put in place for treatment of all waste water streams collected from vessel repair activities. The treatment plant will have a mesh to remove suspended material, sedimentation chamber to remove grit and other suspended matter. Traces of heavy metals will be removed by coagulation and flocculation; the water will be chlorinated to remove any microorganism before disposal. A temporary holding tank will be provided for monitoring of treated effluent prior to discharge.
- An Oil Water Separator will be provided with the ETP for treatment of Bilge and other oil contaminated water. The treated water will be chlorinated prior to disposal.
- Painting activities will be carried out after provision of curtains/ shrouds with durable material and of sufficient height. Antifouling paint with biocides will be avoided. Use of alternative non-toxic coatings, such as silicone-based, epoxy, and other low-friction paints will be considered.

[9] https://www.adb.org/sites/default/files/project-document/67057/39431-sri-seia.pdf
[10] Sri Lanka is not yet signatory to the International Convention for the Control and Management of Ships Ballast Water & Sediments (2004).

- During application of antifouling paint, provision of a bounded area will be made to avoid accidental spillage into the waters. Any spillage will be treated with a suitable absorbent which would be disposed as chemical waste. During removal of antifouling paint, the wash water will be segregated from non-contaminated water. Direct washing of residues into the waters will be avoided. All paint scrapings will be treated as chemical waste and disposed accordingly.
- Blasting residues (abrasive grit and paint flakes) will be cleaned up immediately after the sand/hydro blasting activities to avoid these washing into the sea water. It will be ensured that wastewater from repair activities do not enter the storm water drains and are channelled to the ETP. Since the project will use sponge jet blasting system, generated of waste and wastewater will be greatly reduced. Sponge blasting systems incorporate various grades of water based urethene foam cleaning media in order to clean and prepare surfaces, which can be recycled. The sponge grit waste will be collected in sealed containers and disposed in authorized areas through licensed contractors.
- Oil/water separators, booms, skimmers or other methods will be employed to handle oil spills and minimize related contamination. Oil spill containment and clean-up materials such as absorbent boom, vermiculite, sand bags, absorbent blankets and pillows will be kept on site for spill emergencies to limit the spread of contamination
- The requirement of maintenance dredging will be minimized to the extent possible. Regular monitoring will be undertaken during the dredging activities. Dredging vessels will be well maintained and verified for leaks and spills prior to engagement.

5.3.2 Ecological Impacts

The impact on marine ecology will be mainly because of the generation of pollutants mentioned under marine water and sediment quality section above. Release of heavy metals and pollutants will lead to bio-accumulation, whereas release of bio-toxins associated with antifouling can lead to increased mortality or elimination of algal group and related species. Release of oil contents on to water will result in formation of a shining film on the surface of water which prevents dissolution of oxygen and penetration of sunlight critical for planktons and flora. There will also be temporary disruption of benthic ecology during maintenance dredging activities though it will not have significant ecological impacts.

In order to ensure that the project will have minimal impacts on marine ecology, WCS will ensure that all operational wastewater and sewage is treated prior to disposal. All hazardous waste will be handled and stored adequately to avoid any runoffs.

5.3.3 Impacts on Ambient Noise Levels

Secondary sources[11] have been referred to understand the baseline ambient noise levels in the area, which was observed to be in the range of 63 – 73 dBA during day time and in the range of 58 – 71 dBA in the night time. The daytime levels were within the maximum permissible levels for construction activities stipulated by Central Environmental Authority (75 dB(A) for day time and 50 dB(A) for night time). However night time noise levels exceeded the permissible levels possibly due to contribution of vehicular noise and other Port related activities.

For the purposes of understanding noise emissions impacts from the activities associated with shipyard operations, the noise emission sources present at the site were examined. The main contributors to the day time noise levels are the activities from the Ceylon Fisheries Harbour such as loading and unloading of catch and vehicular noise. Repair and maintenance activities from the shipyard operations will create additional noise. However the character and level of the noise will be highly variable and dependent upon the type of works taking place. Works that involve fabrication, cutting, welding, repair of pipes, milling, drilling, shaping rewinding of motors will be undertaken at the Central Workshop in Sapugaskanda. Some small scale welding works might be undertaken on site along with shot-blasting and angle grinding that will generate significant noise. Main activities to be undertaken at the shipyard and expected noise levels are provided in **Table 5-1** below.

[11] Supplementary EIA Report for Proposed Colombo Port City Development Project, Colombo, Sri Lanka, December 2015

Table 5-1: Main Activities and Expected Noise Levels

Sl. No.	Operational activities	Expected noise level	Type of noise
1.	Hydro blasting	100 dB at 20 m	Intermittent
2.	Surface preparation/ sponge grit blasting	100 dB at 30 m	Intermittent
3.	Painting of hulls using airless spray	60 – 70 dB at 10m	Intermittent
4.	Repair to fibre glass hulls	No significant noise levels	-
5.	Repairs to steel hulls and steel piping systems in vessels	No significant noise levels	-
6.	Repair to electrical equipment	No significant noise levels	-
7.	Undocking of vessels	No significant noise levels	-

The overall potential noise impacts associated with the operational activities are not likely to be significant. There may be intermittent sound level increases over short intervals during operational activities such as high pressure washing, sponge grit blasting and equipment repairs which will generate noise levels in the order of 100 dB. However these operations will be carried out only during day time.

All motors, pumps and compressors will be provided with acoustic enclosures and rubber paddings as noise control measures. All machinery and equipment will be provided with adequate maintenance to ensure reduction of unwanted noise from loose components. High noise generating activities will be prevented during night time to avoid disturbance to the local community. WCS will also explore the possibility of a vegetative belt along the eastern periphery to reduce noise reaching the residential areas. In general, noise generation will be minimized by using physical barriers and enclosures around noise sources.

5.3.4 Impacts on Navigation

The facility being within an existing harbour will not add significantly to existing traffic or vessel movement. The vessels coming to the ship yard for repair and maintenance are not likely to create any navigational issues for other vessels heading to or from the Colombo Port. However, WCS will ensure adequate planning of vessel arrival and will work with the Sri Lanka Ports Authority at an early stage to resolve any concerns and obtain support for vessel movements.

5.3.5 Impacts on Ambient Air Quality

Although no major air emissions are envisaged during project operations, use of primers, paints, coatings, abrasive blasting, use of DG sets, etc. may result in generation of particulate matter and dust. Conventional primers and paints contain solvents and pigments with heavy metals. Many solvents contain volatile organic compounds (VOC) and/or Hazardous Air Pollutants (HAPs) which are known to cause cancer. Similarly coating application processes produce overspray which can contain heavy metals, particulate, and volatiles.

Abrasive blasting can generate large quantities of dust containing high levels of toxic air contaminants, and potential exposure to dust and air contaminants is a primary health hazard. Another potential health hazard is exposure to asbestos containing materials (ACMs). Vessels generally contain asbestos and asbestos containing materials (ACMs) in floors, walls, ceiling panels, fire insulation, heat insulation, lagging, electrical cables, gaskets, etc. O&M workers and the adjacent community will be at high risk to asbestos exposure during repair and maintenance of ships, which is known to be a Category 1 carcinogen.

However, due to use of special surface cleaning method such as sponge jet and high pressure water blasting, air pollution will be minimized. Any painting works will be shrouded in a dome like fashion to prevent the scatter and loss of pollutants. Tasks that will involve handling of asbestos containing materials will also be performed within shrouds to prevent scatter of airborne asbestos fibres. The disposal of ACM shall be carried out in a way that

minimizes asbestos exposure. Any waste asbestos retained on board the ships entering the shipyard should be safely secured and transferred to asbestos disposal pits.

5.3.6 Socio-economic Impacts

The project being located in an urban set up will not bring out significant socio-economic changes, except that it will generate direct and indirect employment opportunities for the local community. The operation phase will involve heavy maintenance and repair works thus generating significant amount of noise, though for limited duration only. High noise generating activities will be limited to daytime. Only sponge grit blasting will be used in surface preparation and painting works will be carried out in covered areas and movable covers to be used. Adoption of such measures will reduce the adverse impacts on the nearby communities.

With the project activities underway in the operational phase, traffic in the area will increase. This could create noise and dust pollution in the area. This increase of traffic would also lead to an increase of road mishaps. WCS while hiring or contracting vehicles will maintain that the drivers of the vehicles are to possess driver's license. In addition, a certain speed limit will be mandated for all vehicles of the company when it passes through busy roads. During operation phase, WCS will also ensure that security personnel have clear instructions on the objectives of their work and permissible actions. WCS will ensure that security staff do not get involved in unwanted issues with the surrounding community and are well aware of the behavioural aspects.

Inclusive of the potential positive impacts that will take place in the area due to the project activities, there are certain activities which will be undertaken by the project proponents as part of their corporate social responsibility (CSR). A specific budget will be allotted by the WCS on annual basis to undertake the activities associated with CSR. CSR activities could encompass provision of educational and health services in the area. A Public Relations Officer will be appointed at project level to assess the needs of the community and coordinate with the corporate office in order to initiate and implement CSR activities.

With regards to impacts on cultural heritage, no cultural or archaeologically significant sites are located within the existing harbour area and hence no impacts are envisaged. Moreover, the Project will not hamper fishing activities in any manner as fishing areas are located far from the site (at about 1.5 km from site).

5.3.7 Health and Safety Risks

Ship repairing and maintenance requires a safe and healthy work environment. The potential impacts associated with shipyard operations include but are not limited to the following:

- Fall and trip hazards while boarding vessels for repair activities or structural failure of ladder or gangway causing the worker to fall or workers getting struck by a moving cargo or material loads
- Fall from heights during works involving spray painting, blasting, steel-works repairs etc.
- Fire hazards due to leakages of flammable gases from faulty valves and cylinders
- Working in confined spaces can lead to hazards such as inadequate supply of air and lighting
- Toxic gases and metal fumes produced from hot works and its applications
- Potential injuries (particularly to eyes) during water jetting and cleaning that is used to dislodge surface particles
- Exposure to high noise levels, although for short term
- Workers such as painters, mechanics, electricians, welders, cutters, pipe fitters, etc. are all at risk of disturbing ACMs and so could potentially be exposed to asbestos fibres.

The mitigation measures that can be put in place to minimize adverse impacts related to occupational health and safety will include, but not limited to:

- A gangway, ramp or permanent stairway of not less than 20 inches walking surface, of adequate strength maintained in safe repair and securely fastened, shall be provided for access to vessels. Each side of such gangway or ramp shall have railing with a mid-rail.
- Scaffolding will only be erected, altered and dismantled under supervision of a competent person. Scaffolding will be constructed of sound, materials in good condition and properly stored when not in use;

- Only authorized and trained personnel will operate the aerial work platform (such as cherry pickers). Safety harness will be worn and anchored to the basket guard rails. The Safe Working Load (SWL) will not be exceeded at any time.
- Compressed gas cylinders are commonly used in the ship repair industry for a variety of operations such as welding, cutting, bracing etc. Such gas cylinders will be used in a vertical position, unless specifically designed to be used otherwise. Cylinders will be fitted with residual pressure valves (non-return valves) to reduce the risk of back flow of water or other materials into the cylinder during use that might corrode it. Adequate safety precautions will be taken during handling, use, storage and transport of gas cylinders.
- All personnel required to enter a confined space will undergo confined space entry training. Personnel who have not undertaken this training are prohibited from entering a confined space. For any activity at Confined Space, the Permit-to-work will need to be obtained from the supervisor. It will be ensured that safe access and egress are provided into and out of the confined space. Where possible, testing of the atmosphere in the confined space prior to entry and continuous monitoring whilst work will be undertaken.
- Permit to work system will also be implemented for hot works, electrical works and work at height.
- Prior to initiation of hot works, it will be checked that there is no flammable material, gas or dry woodwork which could catch fire; and that surfaces which have been in contact with hydrocarbons or toxic substances are completely clean.
- Before electrical work is performed, energized equipment will be guarded, de-energized, or appropriate PPE will be used to prevent worker exposure.
- During shot blasting/ grit blasting and chipping works, a blasting helmet will be used, equipped with silencers or other noise reducing devices to lower the noise level inside the helmet to less than 85 dB (A). The blaster will use suitable earplugs. Hearing tests will be carried out for all blasters before employment and at yearly intervals.
- A permit to work will be released to the workers before commencing the painting operation. Paints and solvents will be accompanied by a Safety Data Sheet (SDS). Painters will use an approved type of air-fed mask/PPE. Adequate ventilation will be maintained so that the space is gas free. This eliminates the danger of fire and paint intoxication.
- The PPE required will be specified either in the procedures or in the permit-to-work or both. Use of PPEs by all workers will be strictly enforced and closely monitored. All workers engaged in the ship repair yard with high noise will be provided with ear plugs and ear muffs as required.
- In order to ensure that the O&M workers are least exposed to asbestos/ ACM during repair and maintenance of vessels entering the shipyard,
    - WCS will be aware that the ship complies with the provisions of SOLAS Chapter II-1 (if it is governed by the Convention) and other relevant national or international legislation.
    - WCS will perform an initial ship inspection through a qualified professional to investigate the possible presence and condition of ACM on board the ship.
    - Workers will know what items might contain asbestos and be able to respond accordingly.
    - While removing asbestos from ACMs, the workers undertaking such tasks will wear appropriate dust masks (preferably NIOSH approved N95 masks) to minimize the exposure to airborne asbestos fibres.
    - Any waste asbestos retained on board the ships entering the dock will be safely secured and transferred to asbestos disposal pits.

5.3.8 Impacts due to Climate Change

The scenario of sea level rise in Sri Lanka is expected to be 1.0 m. rise by 2070 (Natcom 2000). A rise in sea level would lead to increase in tidal influence upstream and also increase salinity in open bays, because the increased cross section would slow the average speed at which freshwater flow to the oceans. Sea level rise will lead to larger inundation. Modelling studies based on sea level rise undertaken by the UNDP[12] (2000) as part of hazard profiling of Sri Lanka indicate that the total inundated area in Colombo district will be 959 ha, 1133 ha, 1327 ha and 1534 ha by year 2025, 2050, 2075 and 2100.

It is likely that the potential changes in sea level may influence the effective operation of the lifts installed at the shipyard. Specifically, the vertical distance from the point at which the lift assumes the weight of the ship and the

[12] http://www.dmc.gov.lk/hazard/hazard/Report/UNDP%20BOOK%20CHAP%2007_%20SEA%20LEVEL%20RISE.pdf

elevation of the dolly that transports it laterally would appear to be sensitive to sea level. In addition, the quay elevations (which may affect the design of the lifts) may not be sufficient to account for sea level rise, which would result in inundations at high tide, possibly impacting on ship repair work.

MTD has taken this situation in consideration for Mutwal shipyard. An electric operated system (hydraulic driven shiplift and transfer systems) is planned which is by far more vulnerable for the works at sea side, especially taking into consideration, that the sea levels are predicted to rise in the years to come. As for the system in Mutwal, MTD has designed the winches to be placed on 50mm thick steel plates. This shall allow MTD at any time in the future, to unlimited raise of the winch positions. The wire ropes have some spare and with a change of drums and wires can be further elevated (over 2m more). The power packs as well, are free standing on legs and can be elevated without modifications. Due to the civil construction though, the connection lines between winches and power packs might need to be renewed (longer length) for the case of elevation. As for the transfer system is independent anyway, the rails can be simply elevated (put an H-beam atop of the old rail and weld new flat bars on it, fill the remaining area with concrete).

6.0 ANALYSIS OF ALTERNATIVES

A necessary part of the IEE process is the consideration of alternatives to the proposed project activity. Analysis of alternatives to the project is undertaken in order to select the most environmental friendly, technologically feasible and financially viable option for a project. For the proposed project, following alternatives have been considered and analysed:

- No project scenario
- Alternative locations
- Alternative technologies and processes

6.1 No Project Scenario

Currently, the ship repair facilities in Sri Lanka are mainly centralized to Colombo Dockyard Ltd (CDL) which predominantly caters for repairs of large vessels up to 125,000 Deadweight Tonnage (DWT). Dry Docks of capacities 8,000 to 30,000 DWT have been converted into new building bays to cater for building orders secured by the Company. This has created problems for the repairs of smaller vessels due to the absence of available facilities and as a result, such repairs as well as small vessel constructions, which could potentially be carried out in Sri Lanka, are drifting to other facilities in the region.

The Mutwal Fishery Harbour provides mainly berthing facilities to local and foreign fishing boats. The harbour is equipped with a slipway to carry out docking of boats and ships. No repair facilities are currently available at the harbour.

Thus it is evident that a strong need exists in Sri Lanka to develop ship building and ship repair facilities for vessels in the size of 1500 – 2000 DWT and to develop facilities for the repair of smaller vessels, fishing boats and crafts. The smaller scale ship building, such as building of tugs, and service vessels requires smaller ship yards, which should also be able to undertake repairs of tugs, fishing vessels, etc. Such facilities are to be developed by the proposed project.

6.2 Alternate Locations

The Government of Sri lanka has put high priority on the development of ship repair facilities and few locations have been identified for such developments, viz. Harnbanthota, Trincomalee, Galle and Oluvil. All the locations were considered as part of project development during the planning. WCS is already in the process of developing repair yards at both Galle and Trincomalee. In addition to the above two locations, WCS also considered development of repair facilities in an area close to the Colombo Port, just 3 km from the site, as it is one of the important Ports in this region of Sri Lanka having large number of incoming vessels.

In view of its emphasis on medium and small scale construction/repairs, it is clearly evident that the Mutwal harbour area is the most suited location for development of the shipyard.

6.3 Environmental and Social Factors

The project is located within an existing harbour which has been developed after protecting and delineating environmental sensitivities. The construction will require minimal dredging works and the existing pier will also reduce the extent of construction required. The project will not interfere with the existing fishing industry, infact it will benefit them with repair facility in close proximity.

The project will not lead to disturbance to the community, and therefore the location is suitable as per environmental and social criteria.

6.4 Alternate Technology

The types of docks that were considered during the conception and planning were:

- **Graving Dock:** A graving dock is a channel cut out of a basin or river in which a caisson is placed in front of the opening and water is pumped out. As the water is pumped out the ship is lowered on to the blocks. This type of dock can handle the largest of vessels.
- **Marine Railway:** This type of dock has blocks mounted on a skid and the skid is lowered into the water on rails. The ship is positioned and chains or line haul up the skid with the vessel on the blocks. In the past horses were used to power these railways. These railways typically do not have as much lifting power as a graving dock or a floating dry dock.
- **Floating Dry dock:** This type of dock is U-Shaped and can be sunk to allow the vessel to enter and be positioned. When the ship is in position the water in the ballast tanks of the dock is pumped out and the dock rises to meet the ship. Then the ship is lifted out of the water by the upward motion of the dock. This type of dock typically can lift heavier ships than the railway but not as heavy as a graving dock
- **Ship Lift:** A ship lift is a modern alternative for a floating dry dock or a graving dry dock. It generally consists of a structural platform that is lifted and lowered by a number of hoists. First, the platform is lowered underwater, then the ship is floated above the support, and finally the platform with ship support and ship is lifted and the ship is brought to the level of the quay.

The ship lift was finalised considering the cost, shorter duration of construction and flexibility of development. The sizes of vessels being planned for repair are smaller and may not require large facilities like a graving dock. A ship lift is easier to manage and will not have major construction requirements.

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7.0 INFORMATION DISCLOSURE AND CONSULTATION

ADB Safeguard Policy requires the project proponent to undertake consultation with affected land losers and other concerned stakeholders and facilitate their informed participation in the project. Based on the consultation process, a grievance redress mechanism for the community is required to be established to receive and facilitate the community concerns and grievances regarding the project.

The land required for the project involves revenue land taken on lease from Ceylon Fisheries Harbours Corporation. The project does not involve procurement or acquisition of private land. There are no involuntary resettlement or rehabilitation issues associated with the project.

Informal consultations were undertaken by AECOM on 30th July 2016 with the fishing community residing near the project area. It was reported during informal discussions that the project has opened up avenues in terms of generation of unskilled and semi-skilled employment opportunities for the local communities residing in the vicinity of the project area. In addition, it was stated that the project once operational would be beneficial for the fishing vessels that would require repair works. The community members were however concerned about noise generation associated with project activities and mentioned that mitigation measures should be adopted to reduce the noise levels.

Besides local communities, informal discussions were held with representatives of the Ceylon Fisheries Harbour Corporation. They informed that the harbour being operational accommodated more than thirty (30) fishing vessels however, with only one shipyard existing and no repair facility within the vicinity, the fishing vessel owners faced a major problem. With the project coming up, they were of the opinion that this would benefit the fishing communities at large as the facility would accommodate around seven (07) vessels at one time which would drastically reduce the repair time period for each vessel.

A Public Relation Officer will be appointed at the Colombo shipyard project site to maintain relation with the external stakeholders and his contact details is provided to local communities residing within the vicinity of the project area.

8.0 GRIEVANCE REDRESSAL MECHANISM

Grievance Redressal Mechanism (GRM) is an important criterion for development projects wherein ongoing risks and impacts of projects are probable. The GRM is an important tool through which the affected communities concerns and complaints are registered and addressed. ADB's Environmental Safeguards requires the project proponent to establish a grievance redress mechanism in order to receive and facilitate resolution of affected people's concerns, complaints and grievances about the project's environmental performance. The mechanism shall use an understandable and transparent process that addresses the affected people's concerns and complaints promptly.

8.1 Tiers of Grievance Redressal

WCS will put in place a two tier grievance mechanism to address the concerns of community or other users in the harbour.

Tier I

- The grievance mechanism at Tier I shall comprise of the Site Manager, EHS officer and a representative each from the Port Authority and Local community.
- The project office shall receive written complaints directly from the aggrieved party or document verbal complaints in register maintained at the reception of the facility.
- All complaints shall be reviewed and responded to within five working days.
- In case, the complainant is not satisfied then they can approach the next level of escalation.
- All response shall be documented and complaint closed on regular basis.

Tier II

- The next level of escalation shall comprise of the Management representative of MTD Walkers in Colombo, the corporate HR, representative of Port Authority, besides a community leader.
- The committee shall further review the complaint, hold discussions if required and respond within 7 -10 days of receipt of complaint
- The complaint will be closed if the complainant is satisfied.
- In case the complainant is not satisfied he can then take recourse to legal action.

8.2 Steps of Grievance Redressal

The steps of grievance redressal for WCS have been provided below. WCS is required to adopt and follow these steps of grievance redressal to make the procedure effective.

Receive and Register a Complaint

- Any stakeholder with concerns pertaining to onsite work such as community health and safety, local employment, community risk, migrant labour etc. may register their complaint in writing to the nominated person/grievance officer at site (Tier I);
- Secured grievance boxes shall be placed at various identified location around the site area and community level;
- If any stakeholder or community member wishes to remain anonymous, he/she can write down the grievances and drop in the available complaint boxes;
- Once a complaint has been received it shall be recorded in the grievance log register or data system;

Assessment and Addressal of Complaint

- The complaint boxes will be opened every fifteen (15) days by EHS Officer and grievances will be forwarded to the Site Manager for further action;
- The grievance will be assessed to determine if the issues raised by the complaint fall within the mandate of the grievance mechanism or not;
- During the assessment of complaints, the site grievance redressal team will gather information about the key issues and concerns and helps determine whether and how the complaint might be resolved;

- The issues will be registered by EHS Manager who will take 2 days to screen and assess the grievance. If the complaint seems to require intervention then it will be considered for further action, otherwise it will be rejected and the same will be communicated to the concerned complainant;
- The grievances will be redressed at the Tier-I within 15 working days. If the grievance fails to be addressed at Tier- I within stipulated time or to the satisfaction of complainant, the grievance will be escalated to the Tier-II to take the final decision pertaining to the complaint.
- A Grievance Redressal Committee is to be formed at Tier II (Corporate Office) to support the Tier I (Site Office) officials if the grievance does not get addressed at Tier I. The GRC will comprise of the Management representative of MTD Walkers in Colombo, the Corporate HR Head, representative of Port Authority, besides a community leader. The GRC will be headed by the representative of Port Authority to maintain the transparency and neutrality of the Committee. A meeting and way forward will be discussed here and the minutes of the meetings will be recorded and maintained;
- The Corporate HR Head will put the case of the grievance along with the Social Specialist in front of the Committee. Deliberations will be accordingly conducted over the matter and a consensus is to be reached between the members of the Committee. If necessary, meetings will be conducted with the complainant and evidence will be examined. The grievance will be closed within 5 working days of referral;
- The complainant will have the opportunity to be present at the committee meetings and discuss the grievance at both the levels. If the grievance remains unresolved even after going through both the levels of GRC, the complainant will have the option to approach the appropriate court of laws for redress.

The existence of the grievance redress mechanism, along with details of its members, will be publicised by WCS through various communicative methods like printed materials, displays, face to face meetings, website updation etc. WCS will inform the local community about the GRM and subsequently remind them of this mechanism on a regular basis during the project construction and operation phases.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Environmental Mitigation Measures

An Environmental Management Plan (EMP) has been formulated for mitigating impacts pertaining to construction and operation phases of the project. The details of the Environment Management Plan have been presented in the **Table 9-1** below:

Table 9-1: Environmental Management Plan

S. N.	Aspect	Potential Impacts	Proposed Management / Mitigation Measures	Responsibility
Construction Phase				
1.	Marine Ecology	▪ Potential siltation ▪ Temporary removal of benthic communities present within the area of the proposed dredging works ▪ Damage to or removal of benthic community ▪ Creation of sediment blooms with high levels of suspended solids ▪ Deterioration of the water quality along the bank due to runoff from construction area and inadequate disposal of sewage/ waste	▪ Dredged material and piling extracts will be utilized for filling low lying areas ▪ Toilets provided at site for construction workers and employees will be connected to septic tank and soak pit system. ▪ Construction area will be bunded and provided with adequate drainage with silt traps to prevent runoff from construction area into the marine waters ▪ Construction workers will be instructed about no disposal or dumping of any kind of waste into the marine waters ▪ Waste storage bins will be provided at conspicuous locations, separately for hazardous and non-hazardous wastes. ▪ During piling activities, soft start procedures will be adopted (i.e. commencing with reduced noise level to allow fishes to move away from the area before increasing the noise levels gradually).	WCS Project Development Team Contractors' Site team
2.	Water and Sediment Quality	▪ Temporary increase in sediment levels during dredging ▪ Potential contamination of groundwater and marine water and sediment through improper transport, storage or handling of fuels and chemicals at site ▪ Deterioration of water quality due to inadequate disposal of sewage	▪ Storage facilities will be designed with paved surface, provided with covered shed and adequate containment facility to prevent any runoffs into the sea and contamination due to accidental spills of lubricating oil, fuel oil, paints, thinner, varnishes, chemicals etc. ▪ Toilets will be connected to septic tanks and construction workers will not be allowed to dispose any kind of waste into the marine waters. ▪ All the debris resulting from construction activities will be removed from the site and transported to designated areas, on regular basis to prevent any runoff.	WCS Project Development Team Contractors' Site team
3.	Ambient Noise Quality	▪ High noise generation due to operation of construction machinery and equipment ▪ Disturbance to habitations immediately east of site ▪ Probable sleep disorders amongst community in case of very high night time noise levels ▪ Occupational hazards of noise amongst workers	▪ Wherever it is unavoidable, acoustic enclosures and noise barriers will be provided in areas of high noise generating sources (such as generators, compressors, forging, cutting etc.). ▪ High noise activities will be avoided during the night time ▪ Construction workers engaged in high noise generating activities will be provided with ear muffs. ▪ Noise absorbers and dampeners will be provided for each high noise generating activity. ▪ Maintenance of vehicles, equipment and machinery will be done regularly to keep noise levels at the minimum.	WCS Project Development Team, Contractor and Onsite Staff
4.	Ambient Air Quality	▪ Increase in existing PM and dust levels in the area due to fugitive dust emissions	▪ Diesel generators will be regularly maintained so as to ensure that emissions from fuel combustion remain at design levels. ▪ Proper maintenance will be undertaken for	WCS Project Development Team

S. N.	Aspect	Potential Impacts	Proposed Management / Mitigation Measures	Responsibility
			all machines and equipment used at site. ▪ Vehicles and vessels engaged for transportation of friable construction materials and spoil will be covered. ▪ Daily sprinkling of water within construction area to control fugitive dust emissions ▪ Proper location of material stockpiles, especially sand and soil downwind from the habitations.	
5.	Traffic and Transport	▪ Temporary increase in sea/ road traffic around project site. ▪ Additional transportation may lead to congestion of the marine navigation channels. ▪ Spill and leaks from poorly maintained boats /vessels may lead to contamination of water and sediments.	▪ WCS will ensure that all vessel movement is undertaken as per the guidelines /norms laid down by the Sri Lanka Port Authority for the Colombo Port Area. ▪ All unwanted movement of vessels will be avoided. ▪ Necessary training will be imparted to the operators of construction vessels and drivers of construction vehicles for speed restrictions to ensure safe operations.	WCS Project Development Team
6.	Socio-economics	▪ Limited adverse socio-economic impacts ▪ Positive impacts envisaged through increase in livelihood opportunities	▪ WCS will implement a grievance redressal mechanism for the community wherein any of the surrounding community members can raise complaints related to construction activities. ▪ Adequate number of guards will be deployed at the site to ensure proper security arrangements. ▪ The guards will be adequately trained on dealing with workers and communities as well as use of force. ▪ WCS will appoint a public relations officer at site level to liaison with the community and record their grievances.	WCS Project Development Team
7.	Occupational Health and Safety and Labour Working conditions	▪ Over exertion, ergonomic injuries, slips and falls on the same elevation associated with poor housekeeping, ▪ Injuries associated with working at heights (ladders, scaffolding, and partially built or demolished structures), moving machinery and exposure to hazardous materials, hot jobs and electrical works	▪ Workers will be trained on lifting and materials handling techniques. ▪ Good house-keeping practices will be implemented at site. ▪ Temporary fall prevention devices will be provided at necessary places and workers will be trained on use of personal fall arrest systems. ▪ Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes will be made mandatory. ▪ Specific PPEs such as respirators, clothing/protective suits, gloves and eye protection will be made available to workers engaged in specific jobs. ▪ A work permit system will be adopted wherein only trained workers equipped with necessary PPEs will be permitted to undertake hot jobs and electrical works. ▪ WCS will ensure that all requirements under the national labour laws will be complied with. The number of working hours for labour will not exceed the permitted requirements under the labour regulations. Adequate number of toilets will be provided at the construction site with separate arrangements for male and female workers. WCS will ensure that no child labour will be engaged at the project site. WCS will also provide grievance redressal mechanism for the workers.	WCS Project Development Team Contractors' Site Team
Operation Phase				
8.	Water Resources, Marine Water and Sediment	▪ Contamination of receiving water due to wastewaters and storm water runoff from the shipyard. ▪ Inadequate disposal of bilge and contaminated ballast water from	▪ All workers will be trained on significance of water conservation to minimize the stress on water resources. ▪ Septic tank along with soak pits shall be provided at the facility for treating the	WCS Project Development Team Contractors'

S. N.	Aspect	Potential Impacts	Proposed Management / Mitigation Measures	Responsibility
	Quality and Marine Ecology	vessels. ▪ Inadequate disposal of other hazardous pollutants. ▪ Maintenance dredging activity will result in temporary disturbance to the dredged area and temporary disruption of benthic ecology ▪ Surface water contamination during dredging operation. ▪ Release of heavy metals and pollutants will lead to bio-accumulation, ▪ Release of bio-toxins associated with antifouling can lead to increased mortality or elimination of algal group and related species ▪ Release of oil contents on to water might prevent dissolution of oxygen	sewage generated. ▪ Provision of septic tanks and soak-pit disposal arrangements shall be as per standard designs. ▪ Repair facility will be fully equipped with weirs and channels for collection of all effluent without any spill. ▪ Bilge and contaminated ballast water will not be discharged from the facility and will be collected in a temporary holding tank or vessel and connected to the effluent treatment system prior to discharge into sea. ▪ An Effluent Treatment Plant (ETP) will be put in place for treatment of all waste water streams collected from vessel repair activities. ETP to have following features: o Mesh to remove suspended material, o Sedimentation chamber to remove grit and other suspended matter. o Traces of heavy metals will be removed by coagulation and flocculation; o Treated effluent will be chlorinated to remove any microorganism before disposal. ▪ An Oil Water Separator will be provided with the ETP for treatment of Bilge and other oil contaminated water. The oily sludge will be collected in tanks and disposed through CEA authorized hazardous waste vendors only. ▪ During painting activities, following measures to be implemented: o Provision of curtains/ shrouds with durable material and of sufficient height during painting o Antifouling paint with biocides should be avoided. o Use of alternative non-toxic coatings, such as silicone-based, epoxy, and other low-friction paints should be considered. o During application of antifouling paint, provision of a bounded area should be made to avoid accidental spillage into the waters. Any spillage will be treated with a suitable absorbent which would be disposed as chemical waste. o During removal of antifouling paint, the wash water should be segregated from non-contaminated water. Direct washing of residues into the waters should be avoided. All paint scrapings should be treated as chemical waste and disposed accordingly. ▪ Following measures to be implemented during blasting: o Blasting residues (abrasive grit and paint flakes) will be cleaned up immediately after the sand/hydro blasting activities to avoid these washing into the sea water. o All wastewater from repair activities to be channelled to ETP. o The sponge grit waste (generated from sponge/ grit blasting) will be collected in sealed containers and disposed in authorized areas through licensed contractors.	Site Team Onsite staff

S. N.	Aspect	Potential Impacts	Proposed Management / Mitigation Measures	Responsibility
			▪ Oil/water separators, booms, skimmers or other methods should be employed to handle oil spills and minimize related contamination. ▪ Oil spill containment and clean-up materials such as absorbent boom, vermiculite, sand bags, absorbent blankets and pillows will be kept on site for spill emergencies to limit the spread of contamination ▪ Dredging vessels shall be well maintained and verified for leaks and spills prior to engagement.	
9.	Ambient Noise Levels	▪ Disturbance to community due to noise generation from operational activities ▪ Workers will be exposed to continuous occupational noise but for limited duration.	▪ All motors, pumps and compressors will be provided with acoustic enclosures and rubber paddings as noise control measures. ▪ All machinery and equipment will be provided with adequate maintenance to ensure reduction of unwanted noise from loose components. ▪ High noise generating activities will be prevented during night time to avoid disturbance to the local community. ▪ WCS will also explore the possibility of a vegetative belt along the eastern periphery to reduce noise reaching the residential areas.	WCS Project Development Team
10.	Ambient Air Quality	▪ Potential exposure to dust and air contaminants (VOC and HAP) is a primary health hazard associated with abrasive blasting and painting activities. ▪ Exposure to asbestos and asbestos containing materials (ACMs) in vessels is another health hazard.	▪ Special surface cleaning methods such as sponge jet and high pressure water blasting will be used to minimize air pollution. ▪ Any painting works should be shrouded in a dome like fashion to prevent the scatter and loss of pollutants. ▪ Tasks that will involve handling of asbestos containing materials should also be performed within shrouds to prevent scatter of airborne asbestos fibres. ▪ Any waste asbestos retained on board the ships entering the shipyard should be safely secured and transferred to asbestos disposal pits.	WCS Project Development Team
11.	Socio-economic Impacts	▪ Increase in traffic ▪ High noise levels ▪ Increase in dust levels ▪ Positive impacts in terms of local income and employment generation	▪ High noise generating activities will be limited to daytime ▪ Only sponge grit blasting will be used in surface preparation and painting works will be carried out in covered areas and movable covers to be used ▪ WCS while hiring or contracting vehicles should maintain that the drivers of the vehicles are to possess driver's license ▪ Certain speed limit should be mandated for all vehicles of the company when it passes through busy roads. ▪ WCS will also ensure that security personnel have clear instructions on the objectives of their work and permissible actions ▪ WCS will undertake certain CSR activities in the nearby areas and a specific budget will be allocated for this purpose. ▪ WCS will appoint a public relations officer at site level to liaison with the community and record their grievances.	WCS Project Development Team
12.	Occupational health and safety risks and Labour Working conditions	▪ Fall and trip hazards while boarding vessels for repair activities or structural failure of ladder or gangway causing the worker to fall or workers getting struck by a moving cargo or material loads ▪ Fall from heights during works	For details, ***Section 5.3.7*** should be referred. ▪ Provision of an adequate gangway, ramp, or permanent stairway to access to dry docks with adequate guarding. ▪ Scaffolding should be constructed of sound, materials in good condition and	WCS Project Development Team Contractors' site team Onsite staff

S. N.	Aspect	Potential Impacts	Proposed Management / Mitigation Measures	Responsibility
		involving spray painting, blasting, steel-works repairs etc. ▪ Fire hazards due to leakages of flammable gases from faulty valves and cylinders ▪ Working in confined spaces can lead to hazards such as inadequate supply of air and lighting ▪ Toxic gases and metal fumes produced from hot works and its applications ▪ Potential injuries (particularly to eyes) during water jetting and cleaning that is used to dislodge surface particles ▪ Exposure to high noise levels, although for short term ▪ Workers such as painters, mechanics, electricians, welders, cutters, pipe fitters, etc. are all at risk of disturbing ACMs and so could potentially be exposed to asbestos fibres.	properly stored when not in use; ▪ Only authorized and trained personnel should operate the aerial work platform (such as cherry pickers). ▪ Safety harness must be worn and anchored to the basket guard rails. The Safe Working Load (SWL) must not be exceeded at any time. ▪ Compressed gas cylinders will be used in a vertical position, unless specifically designed to be used otherwise. ▪ Cylinders will be fitted with residual pressure valves (non-return valves) to reduce the risk of back flow of water or other materials into the cylinder during use that might corrode it. ▪ Adequate safety precautions will be taken during handling, use, storage and transport of gas cylinders. ▪ All personnel required to enter a confined space will undergo confined space entry training and permit to work shall be obtained from supervisor. ▪ Permit to work system will also be implemented for hot works, electrical works and work at height. ▪ Necessary precautions to be taken prior to initiation of hot works and electrical works. ▪ A permit to work should be released to the workers before commencing the painting operation. ▪ Use of PPEs by all workers shall be strictly enforced and closely monitored. ▪ Asbestos/ ACM management measures to be implemented at site. ▪ WCS will ensure that all requirements under the national labour laws will be complied with. The number of working hours for employees will not exceed the permitted requirements under the labour regulations. WCS will also provide grievance redressal mechanism for the employees.	

9.2 Environmental Monitoring Plan

Environmental monitoring needs to be conducted at regular intervals to assess the efficacy of EMP and identify corrective measures required, if any. The following monitoring activities shall be carried out at the proposed facility.

Table 9-2: Environmental Monitoring Plan

S.N.	Sources / Locations	Parameters	Frequency	Responsibility	Budget Allocated (USD)
CONSTRUCTION PHASE					
1	**Ambient Air Monitoring**				
1.1	One sampling location as per prevalent wind direction of the season	$PM_{2.5}$, PM_{10}, SO_2, NO_x, CO	Twice in a week for 24 hours (**twice during the construction phase**)	WCS Project Team	2500
2	**Noise Monitoring**				
2.1	Monitoring at two locations – on site and offsite (residential area towards east)	LAeq (Night), LAeq (day), LAeq (24 hourly)	24 hours continuous **(twice during the construction phase)**	WCS Project Team	500
3	**Water Quality Monitoring**				

S.N.	Sources / Locations	Parameters	Frequency	Responsibility	Budget Allocated (USD)
3.1	Marine Water quality at two points – one near shore and one far shore	pH, TDS, Dissolved Oxygen, Biological Oxygen Demand, turbidity, Total Coliforms and electrical conductivity	Twice during the construction phase	WCS Project Team	700
3.2	Ground Water at one location (residential area towards east)	Physical, Chemical and Biological parameters as per Sri Lanka Drinking Water Standards, SLS 614: 2013	Twice during the construction phase	WCS Project Team	300
4	**Sediment Quality Monitoring**				
4.1	One sediment sample from near shore location	pH, CEC, sediment oxygen demand (SOD),Total organic carbon (TOC), heavy metals (Schedule II of Marine Pollution Prevention Act, No. 35 of 2008 provides the sediment quality guideline for dredged material proposed for dumping at sea)	Twice during the construction phase; sediment sample to be tested prior to start of dredging activity in each area where dredging will be initiated.	WCS Project Team	250
5	**Workers Health and Safety Monitoring**				
5.1	Monitoring of point sources such as diesel generator sets, compressors, pumps, pneumatic tools, vibrators, concrete mixers	Noise in dB(A) measured at 1 m distance from the point source	Quarterly during construction phase	Site Safety Officer	500
5.2	Occupational Health and Hygiene within construction site	Exposure to chemicals and occupational noise	Quarterly during construction phase	Site Safety Officer	300
5.3	Labour working conditions	Facilities provided to labour and their conditions – number of toilets, presence of child labour, monitoring of working hours and wages paid.	Weekly during construction phase	Site Safety Officer	--
OPERATION PHASE					
1	**Ambient Air Monitoring**				
1.1	Two sampling locations as per prevalent wind direction of the season	$PM_{2.5}$, PM_{10}, SO_2, NO_x, CO	Twice in a week for 24 hours each at each location (**twice a year**)	WCS Safety, Environmental & Fire Officer	5000 p.a.
2	**Noise Monitoring**				
2.1	Monitoring at two locations – on site and offsite (residential area towards east)	LAeq (Night), LAeq (day), LAeq (24 hourly)	24 hours continuous **bi-annually**, preferably during ongoing repair activities	WCS Safety, Environmental & Fire Officer	500 p.a.
3	**Water Quality and Wastewater Monitoring**				
3.1	Marine Water quality at two points – one near shore and one far shore	pH, TDS, Dissolved Oxygen, Biological Oxygen Demand, turbidity, Total Coliforms and electrical conductivity	Twice a year	WCS Safety, Environmental & Fire Officer	700 p.a.
3.2	Waste Water at discharge points	Physical and Chemical parameters as specified by MEPA/CEA guidelines	Quarterly *(in case discharge is more frequent, then every batch of treated effluent should be tested prior to discharge)*	WCS Safety, Environmental & Fire Officer	1000 p.a.

S.N.	Sources / Locations	Parameters	Frequency	Responsibility	Budget Allocated (USD)
3.3	Ground Water at one location (residential area towards east)	Physical, Chemical and Biological parameters as per Sri Lanka Drinking Water Standards, SLS 614: 2013	Annually	WCS Safety, Environmental & Fire Officer	400 p.a.
4	**Sediment Quality Monitoring**				
4.1	One sediment sample from near shore location	pH, CEC, sediment oxygen demand (SOD),Total organic carbon (TOC), heavy metals	Annually	WCS Safety, Environmental & Fire Officer	200 p.a.
5	**Workers Health and Safety Monitoring**				
5.1	Monitoring of point sources such as diesel generator sets, compressors, pumps, pneumatic tools, vibrators, concrete mixers	Noise in dB(A) measured at 1 m distance from the point source	Quarterly	WCS Safety, Environmental & Fire Officer	500 p.a.
5.2	Occupational Health and Hygiene within project site	Exposure to chemicals and occupational noise Monitoring of incidents (including accidents, near misses, etc.)	Annually Periodic basis	WCS Safety, Environmental & Fire Officer	300 p.a.
6	**Social Aspects**				
6.1	Grievance Redressal	Grievances raised, actions taken, number of grievance cell meetings	Twice a year	WCS Grievance Redressal Committee	No additional budget required

9.3 Budget Allocation for EMP Implementation

The following table provides the capital cost and recurring cost of implementation of environmental management and monitoring measures, including waste water treatment facilities, for both construction and operation phases.

Table 9-3: Budget Allocation for EMP Implementation

S. N.	Equipment Name	Capital Cost USD (Budgetary)	Recurring Cost USD per annum
A)	**Construction Phase**		
1	Provision of adequate drainage and bunds, water sprinkling etc.	40,000	5,000
2	Provision of tin sheets acting as noise barriers towards eastern portion of site and acoustic enclosures around high niose generating equipment	15,000	3000
3	Miscellaneous expenses for construction phase EMP implementation such as provision of waste storage bins, paved storage facilities, engagement of license contractors for waste disposal, PPEs for workers, maintenance of vehicles and equipment, provision of occupational H&S systems	80,000	60,000
4	EHS Training to staff, workers and contractors	15,000	10,000
5	Environment monitoring from external agencies	-	5,050
	Sub Total (A)	***1,50,000***	***83,050***
B)	**Operation Phase**		
1	Septic tank-soak pit system	45,000	10,000
2	Effluent Treatment Plant and Oil Water Separator	1,00,000	50,000
3	Provision of spill containment equipment	25,000	5,000

S. N.	Equipment Name	Capital Cost USD (Budgetary)	Recurring Cost USD per annum
4	Miscellaneous expenses for operation phase EMP implementation such as provision of waste storage bins, paved storage facilities, engagement of licensed contractors for waste disposal, PPEs for workers, maintenance of vehicles and equipment and provision of occupational H&S systems	1,20,000	60,000
5	Pollution monitoring from external agencies	-	8,600
6	Environment, health and safety training for staff development and EMP evaluation	50,000	50,000
7	EHS Department monitoring, reporting, and statutory compliance	50,000	50,000
8	Annual compliance audit through third party	-	12,000
	Sub Total (B)	***3,90,000***	***2,45,600***
	Total Cost (A+B)	**5,40,000**	**3,28,650**

9.4 Institutional Arrangements

As discussed earlier under Section 3.2, WCS has deputed a Fire and Safety Officer at site who is currently responsible for supervising implementation of EHS aspects at site. The Project Development Team of WCS will have the overall responsibility for implementation of the construction phase EMP. The Fire and Safety Officer will supervise the daily activities at site and report any issues to the Project Development Team and Site Engineer on regular basis. The Project Development Team from site will report to the General Manager on the progress of EMP implementation.

Similarly, the operation phase of the Project will have an EHS Department. A Safety, Environmental and Fire Officer will be deputed at site for managing the EHS issues at site and supervise the implementation of operation phase EMP. The overall management of the project will be undertaken through Safety & Compliance Team under the Group Safety & Compliance Division, during operation phase. The team will work in close coordination with other departments of WCS.

This EMP is an environment management tool which needs to be reviewed periodically to address any changes in the organization, process or regulatory requirements. This EMP would be reviewed after receiving all the necessary clearances and permits to include their requirements. The EMP shall be reviewed and updated every six months. The Safety & Compliance Team will have regular meetings in order to review the EMP and monitoring plans. The review procedures will cover the review criteria, scope, frequency and methods, as well as responsibilities and reporting results and retaining associated records. WCS will submit the review reports on the progress of implementation of the EMP to ADB on annual basis.

10.0 CONCLUSION AND RECOMMENDATION

The Colombo Shipyard by Walkers Colombo Shipyard Pvt. Limited (WCS) is a development initiative taken by the MTD Walkers Group to provide ship/ vessel repair facilities near the Colombo Port, in lieu of the absence of availability of such facilities in the area due to which repairs as well as small vessel constructions are drifting to other facilities in the region. There is a strong need in Sri Lanka to develop ship building and ship repair facilities for vessels in the size of 1500 – 2000 DWT and to develop facilities for the repair of smaller vessels, fishing boats, yachts and crafts. Such facilities are to be developed by the proposed project.

The project is being developed within the existing Mutwal Fishery Harbour managed by Ceylon Fishery Harbour Corporation. The Mutwal Fishery Harbour provides mainly berthing facilities to local and foreign fishing boats and does not have repair facilities currently. There are no significant social impacts associated with the project as no additional land procurement is involved, therefore there are no resettlement issues and no loss of livelihood to the local community. There are no indigenous communities in the project area. Moreover, the project is located within an urban set up and will not alter the socio-economic condition of the area significantly.

The project operations will not have any significant environmental issues except wastewater generation and increased noise levels. The project intends to treat all its waste water before disposal into marine waters. An Effluent Treatment Plant will be provided to treat the wastewater generated from operations, an Oil Water Separator will be provided to treat all oil contaminated waste water and bilge water from the vessels coming in for repair. Adequate noise control measures will also be implemented.

As per ADB categorization system, the project has been categorized as ***Category B*** based on Environmental Safeguards as the impacts assessed during the study are site-specific and can be managed through implementation of recommended mitigation measures and ***Category C*** as per Involuntary Resettlement and Indigenous Peoples Safeguards. This IEE has examined the project's potential negative and positive environmental impacts, compared them with feasible alternatives (including the "without project" situation), and recommended measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and to improve environmental performance.

WCS will establish an environmental management system for the project based on the project-specific EMP. This will be overseen, monitored, and audited by WCS and implemented by a dedicated team. WCS will also ensure that the Project conforms to all the legal, regulatory and policy objectives and also ensure that all the necessary permits are obtained and renewed from time to time.

APPENDIX A

Environment and Social Compliance Audit Report for Colombo Shipyard

Environment and Social Compliance Audit Report
Walkers Colombo Shipyard (Pvt.) Ltd., Colombo, Sri Lanka

Prepared for:

Asian Development Bank

MTD Walkers PLC

September 2016

Environment and Social Compliance Audit Report

Prepared for

Asian Development Bank (ADB)

Prepared by

AECOM India Private Limited

Date: September 2016

Quality Information

Site Visit, Review and Report Preparation	Reela Mishra (Senior Environmental Consultant)	Signature:_____
	Ajay Pillai (Associate Director, Environment)	Signature:_____
Quality Control Review	Somnath Mukherjee (Executive Director, Environment)	Signature:_____

Revision History

Revision	Revision Date	Details	Authorized Signatory Name/ Position	Signature
Revision No. 1	15 February 2017	Addressal of comments by Lenders	Ajay Pillai, Associate Director, Environment	
Revision No. 2	12 June 2017	Updation of Corrective Action Plan	Ajay Pillai, Associate Director, Environment	

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EXECUTIVE SUMMARY

MTD Walkers PLC (hereinafter referred to as 'MTD Walkers') is an engineering and infrastructure firm based in Sri Lanka, with established track record in multidisciplinary engineering activities, both locally and overseas. MTD Walkers has a robust portfolio of infrastructure related business in civil engineering, mechanical engineering, electrical engineering, pile construction, power generation, marine engineering and real estate. The company was founded in 1854 as John Walker and Company as a manufacturing firm for coffee machinery at Kandy. In 2006, the company acquired CML Edwards Construction Ltd. and was restructured to form Walkers CML. Thereafter, in 2009, MTD Capital Bhd acquired the Walkers Group of companies from Kapila Heavy Equipment, subsequently rebranding the Group as MTD Walkers PLC.

With the vision of further diversification in the marine engineering sector, MTD Walkers has launched the Walkers Colombo Shipyard (Pvt) Ltd. (hereinafter referred to as 'WCS') and Walkers Galle Shipyard (Pvt) Ltd. (hereinafter referred to as 'WGS'), both being ship repair facilities in Colombo and Galle respectively. In order to streamline the management of marine engineering business, MTD Walkers intends to incorporate Walkers Shipyards Limited (hereinafter referred to as 'WSL') which will be the holding company of the marine engineering division. As part of this endeavour, MTD Walkers seeks investment from the Asian Development Bank (hereinafter referred to as 'ADB') in its marine engineering infrastructure facilities.

As per the requirements of ADB, an independent evaluation of environmental and social systems of the borrower is required to ensure compliance with ADB Safeguard Policy Statement, 2009. MTD Walkers have therefore engaged AECOM India Private Limited (hereinafter referred to as 'AECOM') to review and assess the environmental, H&S and social compliance of MTD Walkers and operations of its marine engineering arm, against the stipulated reference framework including ADB SPS, Social Protection Strategy, 2001, Public Communications Policy, 2011 and applicable national and local regulatory requirements. This report presents details of observations made as part of E&S compliance audit of Ship repair yard under Walkers Colombo Shipyard (Pvt) Ltd., at Colombo (hereinafter referred to as 'shipyard') and Central Workshop under Walkers and Sons Engineers (Pvt) Ltd., at Sapugaskanda.

The ship repair yard at existing Mutwal Fisheries Harbour, Colombo is being developed under Walkers Colombo Shipyard (Pvt.) Limited (WCS). The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., a ship repair and ship building entity that had entered into 25 year lease agreement with Ceylon Fishery Harbours Corporation to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015. WCS proposes to develop ship building and ship repair facilities at the Colombo shipyard, for vessels such as naval vessels (up to 65 m), fishing vessels, landing crafts, passenger vessels, works vessels and barges. Development works are under progress to provide floating repair services up to 80 m long vessels and dry berth repair services up to 42 m long vessels. The construction activities for redevelopment of Colombo Shipyard have been initiated by WCS and it is expected to be completed by January 2017.

The Central Workshop at Sapugaskanda will be a support facility to the shipyard as repair and maintenance works of vessels which involve general fabrication will be undertaken at the workshop. The company has plans to shift the Central Workshop to an industrial area in Delkanda, owned by the State Engineering Corporation (SEC). The land within the SEC premises will be taken on lease by WCS. The process of entering into lease agreement is under progress. Work orders for structural works have been issued to contractors by WCS.

The key issues identified during the course of E&S assessment has been presented below. A corrective action plan based on the gaps has been recommended along with actions to be taken and timeline for completion.

1. Site is partially operational (floating repairs were being undertaken on the day of visit), however Permit for Development Activity from Coast Conservation Department has not yet been obtained. Following permits have **not** been obtained for the project yet:
    a. Environment Protection License from Central Environmental Authority (CEA)
    b. Fire Safety Clearance from Fire Service Department

   c. Water Sanction and Drainage Certificate from Water and Drainage Department of the Municipal Council of Colombo
   d. Permission for Water Connection from Water Supply Board
   e. Electricity Permission from Ceylon Electricity Board
2. Existing septic tank capacity not known and design of operation phase septic tank - soak pit system not available for review. Effluent treatment system not proposed for operation phase. Wastewater collection and treatment system not provided at site to manage hazardous substances generated during floating repairs.
3. Oil spill management plan for construction and operation phases not developed. Oil spill containment and clean up materials not provided.
4. Air emission monitoring not conducted at site for construction phase. Air emission monitoring plan not yet developed for operations.
5. Ambient noise level monitoring not conducted at site as the site is in close vicinity to residential areas. Workers not provided with ear muff and ear plugs.
6. Poor waste management at site, segregation of waste not practiced at site; single bins are provided for collection of hazardous and non-hazardous waste. Agreement with MEPA authorized vendors not available.
7. No formalised grievance mechanism has been developed by WCS at the site level.
8. Unsafe practices related to hot works, electrical safety, fire and life safety, hazardous chemical, lifting tools and tackles and confined space entry
9. No risk assessment study to identify the impacts of the project on the marine ecology.
10. Identification and mapping of stakeholders not undertaken at site level. No Public Relation Officer has been nominated at site level. Identification and mapping of stakeholders not undertaken at site level. No Public Relation Officer has been nominated at site level.
11. There is no system of evaluating the contractor's performance based on health and safety practices at site.

Project Categorization

The proposed project is classified as **Category B** as per Environmental Safeguards and **Category C** as per Involuntary Resettlement and Indigenous Peoples Safeguards, based on the following factors:

- The project is located within the existing Mutwal Harbour, already being used for docking of fishing boats, and does not bring about any land use change.
- The project will be implemented within sensitive natural environment, which has to be taken care of as part of the harbour development.
- The project will generate waste water, waste oil and dust from grit/steel shot blasting. The impacts are small considering the kind of vessels to be handled and are proposed to be managed through an environmental management system being developed by WCS.
- The project does not involve any land acquisition and involuntary resettlement as the shipyard is located within the existing harbour premises. The project will also help in enhancing local employment.

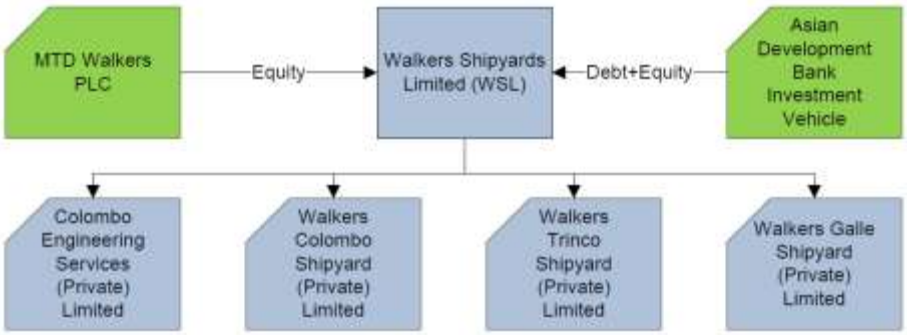
1.0 INTRODUCTION

MTD Walkers PLC (hereinafter referred to as 'MTD Walkers') is an engineering and infrastructure firm based in Sri Lanka, with established track record in multidisciplinary engineering activities, both locally and overseas. MTD Walkers has a robust portfolio of infrastructure related business in civil engineering, mechanical engineering, electrical engineering, pile construction, power generation, marine engineering and real estate. MTD Walkers has been through a period of rapid growth which has resulted in turnover reaching Sri Lankan Rupees ('LKR') 14 Billion for FY-2014/2015 (US$ 104 Million).

The company was founded in 1854 as John Walker and Company as a manufacturing firm for coffee machinery at Kandy. In 1891, the firm assumed limited liability status in the United Kingdom as Walker Sons and Company. With the development and proposed expansion of Colombo Port, the company shifted based to Colombo and entered into the construction industry through Walker Piling (Pvt.) Ltd. In 2006, the company acquired CML Edwards Construction Ltd. and restructured to form a fully integrated infrastructure solutions provider, Walkers CML. Thereafter, in 2009, MTD Capital Bhd acquired the Walkers Group of companies from Kapila Heavy Equipment, subsequently rebranding the Group as MTD Walkers PLC.

In 2013, MTD Walkers acquired Colombo Engineering Services (Pvt.) Ltd. (CESPL) to re-enter the marine engineering business. CESPL is an established firm in marine engineering and repairs within the Sri Lankan shipping industry. With the vision of further diversification in the marine engineering sector, MTD Walkers has launched the Walkers Colombo Shipyard (Pvt) Ltd. (hereinafter referred to as 'WCS') and Walkers Galle Shipyard (Pvt) Ltd. (hereinafter referred to as 'WGS'), both being ship repair facilities in Colombo and Galle respectively. There are further plans to expand services to the east coast of Sri Lanka through establishment of a vessel repair facility at Trincomalee managed by Walkers Trinco Shipyard (Pvt) Ltd. (hereinafter referred to as 'WTS').

In order to streamline the management of marine engineering business, MTD Walkers intends to incorporate Walkers Shipyards Limited (hereinafter referred to as 'WSL') which will be the holding company of CESPL, WCS, WGS and the proposed WTS. As part of this endeavour, MTD Walkers seeks investment from the Asian Development Bank (hereinafter referred to as 'ADB') in its marine engineering infrastructure facilities. ADB will provide a direct loan of $12 million, which will benefit from a corporate guarantee by MTD Walkers. MTD Walkers is in discussions with local commercial lenders, including LB Finance PLC (LBF), to provide the remaining $5 million debt on similar terms. In addition, ADB is planning to invest $3 million equity to support development of the two ship repair yards – WCS and WGS, alongside the company's $13 million injection of fresh equity.



1.0 Purpose

As per the requirements of ADB, an independent evaluation of environmental and social systems of the borrower is required to ensure compliance with ADB Safeguard Policy Statement, 2009. MTD Walkers have therefore engaged AECOM India Private Limited (hereinafter referred to as 'AECOM') to review and assess the environmental, H&S and social compliance of MTD Walkers and operations of its marine engineering arm, against the following reference framework:

- ADB's Safeguard Policy Statement (SPS), 2009;
- ADB Social Protection Strategy, 2001;
- Policy on Gender and Development, 1998;
- Public Communications Policy, 2011;
- Applicable national and local regulatory requirements;
- Host country obligations under international law.

As part of the assessment, AECOM conducted site visits to the (2) two ship repair yards, one (1) central workshop and corporate office of MTD Walkers. This report presents details of observations made as part of E&S compliance audit of following facilities (hereinafter referred as "Project"):

1. Ship repair yard under Walkers Colombo Shipyard (Pvt) Ltd., at Colombo (hereinafter referred to as 'shipyard').
2. Central Workshop under Walkers and Sons Engineers (Pvt) Ltd., at Sapugaskanda.

Details pertaining to the project's background and status are elaborated in *Section 2.0* of the report. The observations made by AECOM professionals during the assessment are detailed under *Section 3.0* of the report along with recommendations and corrective action plan to mitigate or minimize the environment and social (E&S) risk or impact(s), if any.

1.1 Scope of Work

The scope of work entails the independent verification of all environmental and social aspects of the project components and associated facilities, within the assessment framework. This includes a compliance audit of both the facilities for environment, health and safety and social aspects (including land acquisition and resettlement impacts, indigenous peoples, labour, gender, consultation and participation, among others) and MTD Walkers' marine operations as per the requirements of applicable reference framework presented in *Section 1.3*.

The scope for this assessment covers:

- Reviewing the documents pertaining to the project against the applicable reference framework;
- Undertake site visit to assess effectiveness of existing management measures and systems pertaining to environmental and social commitments;
- Identifying EHS and Social issues of concern and gaps;
- Recommending appropriate, practical and locally feasible measures to address the gaps; and
- Developing a Corrective Action Plan (CAP) to implement these recommendations.

1.2 Methodology

The methodology adopted for execution of the E&S assessment of the project has been detailed below:

- A list of information required for the project was shared with the company after the kick-off meeting.
- Review of all existing documents pertaining to project was undertaken as detailed in *Section 1.4* of the report.
- A four (4) member team comprising of Environment, Health Safety and Social experts from AECOM undertook reconnaissance site visit of the facility on 27th and 30th July 2016 and the following activities were carried out:
    - Direct observation of the entire project area, with a focus on the sensitive environmental, health/ safety and social features and receptors;
    - Consultation with the project developers, contractors and workers to understand the project details, how the project proponents are meeting the statutory requirements (permits, licenses etc.), and the challenges they have been facing in terms of environmental, health & safety and social issues if any;

- Discussions with the surrounding community to assess overall perceptions and opinions about the project and to identify any potential issues of conflicts;
- Assessment of the capacity and management structure of the parent company to address environment, labour, health & safety issues and impacts;
- Review of the adequacy of the designs/measures (including any proposed actions), skills/capacities of the team, budget etc. (relevant to E&S);

- Based on review and verifications, the present report has been prepared which comprises of observations on compliance to and gaps with respect to the reference framework, as detailed under *Section 3.0*; and
- Recommendation of additional actions to close the gaps, detailing actions to be implemented and timeframes for completion of such actions/measures has been provided under *Section 4.0* of this report.

1.3 Applicable Regulatory Framework

1.1.1 National Regulations

Based on review of MTD Walkers' operations, the environmental and social regulations under national regulatory structure of Sri Lanka, as presented in *Table 1-1* are applicable. The applicability and permit requirement have been discussed in detail as part of Table 2-1 of IEE dated September 2016. The project is largely compliant to the requirements cited under the regulations. However it was observed that certain operational permits have not been obtained by WCS. The list is provided *Section 2.5* of this report.

Table 1-1: EHS and Social Regulations at National Level

Environment	▪ National Environmental Act (NEA) No. 47 of 1980 and subsequent amendments (1988, 1995, 1999 and 2000) ▪ Coast Conservation Act No. 57 of 1981 ▪ Industrial Development Act No.36 of 1969 ▪ National Heritage Wilderness Areas Act, No.3 of 1988 ▪ Fauna and Flora Protection Ordinance, No.2 of 1937 ▪ Felling of Trees(control)Act No.9 of 1951 ▪ Pollution Control Guidelines prepared by the Central Environmental Authority ▪ Wildlife & Nature Protection Society Act No.29 of 1968 ▪ Forests Ordinance, No. 16 of 1907 ▪ Water Resources Board Act, No.29 of 1964 ▪ Marine Pollution Prevention Act, No.59 of 1981 ▪ Maritime Zones Law No. 22 of 1976 ▪ Fisheries Ordinance No.24 of 1940 ▪ Regulation of Foreign Fishing Boats Act No.59 of 1979
Health and Safety	▪ Factories Ordinance No. 45 of 1942 ▪ Ports (Ship Repairing) Regulation, 1982 ▪ Motor Traffic Act, No.14 of 1951 ▪ Sri Lanka Ports Authority Act, No.51 of 1979 ▪ Electricity Act No.19 of 1950
Social	▪ State Lands Ordinance, No.8 of 1947 ▪ State Lands Encroachments Ordinance, No. 12 of 1840 ▪ Land Development Ordinance, No. 19 of 1935 ▪ Antiquities Ordinance No. 9 of 1940 ▪ Shops and Office Employees Act, 1954 ▪ Factories Ordinance, 1942 ▪ Industrial Dispute Act, 1951 ▪ National Child Protection Authority Act No. 50 of 1998, 1939; No 48 Children and Young Persons Ordinance as amended, 1956; No. 47 Employment of Women, Young Person and Children Act as amended by Act Nos; 43 of 1964, 29 of 1973, 32 of 1984 and the regulations made thereunder ▪ Maternity Benefit Ordinance, 1941 ▪ Workmen Compensation Act, 1935

	▪ Trade Union Ordinance, 1935 ▪ Wages Board Ordinance, 1950 ▪ Payment of Gratuity Act No. 12, 1983 ▪ Privilege Leave (Private sector) Law No. 14 of 1976

Apart from above, various policies have also been formulated by the Ministry of Environment and Natural Resources of Sri Lanka as listed hereunder:

- National Environment Policy – 2003
- National Forestry Policy – 1995
- National Air Quality Management Policy – 2000
- National Watershed Management Policy – 2004
- Cleaner Production Policy – 2004
- National Biosafety Policy – 2005
- National Air Quality Management Policy – 2000
- National Policy on Wetlands – 2005
- National Policy on Solid Waste Management

1.1.2 National Standards

The national environmental standards to be complied by the Project have been detailed below.

Air Quality Standards

The ambient air quality standards are defined in the National Environmental (Ambient Air Quality) Regulations, 1994 and are provided below:

Table 1-2: Ambient Air Quality Standards

Sl. No.	Pollutant	Averaging Time*	Maximum Permissible Level	
			µg/m^3	ppm
1.	PM_{10}	Annual	50	-
		24 hours	100	-
2.	$PM_{2.5}$	Annual	25	-
		24 hours	50	-
3.	Nitrogen Dioxide (NO_2)	24 hours	100	0.05
		8 hours	150	0.08
		1 hour	250	0.13
4.	Sulphur Dioxide (SO_2)	24 hours	80	0.03
		8 hours	120	0.05
		1 hour	200	0.08
5.	Ozone (O_3)	1 hour	200	0.1
6.	Carbon Monoxide (CO)	8 hours	10,000	9.00
		1 hour	30,000	26.00
		Any time	58,000	50.00

** Minimum number of observations required to determine the average over the specified period-*
03 hour average – 03 consecutive hourly average.
08 hour average – 08 hourly average.
24 hour average – 18 hourly average.
Yearly average – 09 monthly averages with at least 02 monthly average each quarter.

Wastewater Discharge Standards

The National Environmental (Protection and Quality) Regulation No. 1 of 1990 has stipulated various tolerance limits for industrial wastewater and sewage discharged into inland waters and marine coastal waters. The tolerance limits for discharge into marine coastal waters are presented below:

Table 1-3: Tolerance limits for industrial and domestic waste water discharged into Marine coastal waters (Sri Lanka Standards 721:1985)

Sl. No.	Parameter	Unit, Type of Limit	Tolerance Limit values
1.	Total suspended solids	mg/l, max.	150
2.	Particle size of- (a) Floatable solids (b) Settlable solids	mm, max. µm, max.	3 180
3.	pH at ambient temperature	-	5.5-9.0
4.	Biochemical Oxygen Demand (BOD5 in five days at 200C or BOD3 in three days at 270C)	mg/l, max.	100
5.	Temperature	0C, max.	450C at the point of discharge
6.	Oils and greases	mg/l, max	20
7.	Phenolic compounds (as C6H5OH)	mg/l, max	5
8.	Chemical Oxygen Demand (COD)	mg/l, max	250
9.	Total residual chlorine	mg/l, max	1.0
10.	Ammonical Nitrogen	mg/l, max	50
11.	Cyanide (as CN-)	mg/l, max	0.2
12.	Sulphides (as S2-)	mg/l, max	5.0
13.	Fluorides (as F-)	mg/l, max	15
14.	Arsenic (as As)	mg/l, max	0.2
15.	Cadmium (as Cd)	mg/l, max	2.0
16.	Chromium, total (as Cr)	mg/l, max	2.0
17.	Chromium, Hexavalent (as Cr6+)	mg/l, max	1.0
18.	Copper (as Cu)	mg/l, max	3.0
19.	Lead (as Pb)	mg/l, max	1
20.	Mercury (as Hg)	mg/l, max	0.01
21.	Nickel (as Ni)	mg/l, max	5.0
22.	Selenium (as Se)	mg/l, max	0.1
23.	Zinc (as Zn)	mg/l, max	5.0
24.	Pesticides	mg/l, max	0.005
25.	Organo-Phosphorus compounds	mg/l, max	1.0
26.	Chlorinated hydrocarbons (as Cl)	mg/l, max	0.02
27.	Faecal Coliform	MPN/100ml, max.	60
28.	Radio Active Material: (e) Alpha emitters (f) Beta emitters	micro curie/ml, max	10^{-8} 10^{-7}

Note: These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution

Water Quality Standards

The Sri Lanka drinking water quality standards are provided below:

Table 1-4: Sri Lanka standard specification for potable Water (Sri Lanka Standards SLS 614: 2013)

Sl. No.	Parameter	Requirement
1.	Colour, Hazen Units, (max.)	15
2.	Odour	Unobjectionable
3.	Taste	Unobjectionable
4.	Turbidity, (NTU) (Nephelometric Turbidity	2

Sl. No.	Parameter	Requirement
	Units), (max.)	
5.	pH at 25 ^{0}C + 2 ^{0}C	6.5 to 8.5
6.	Aluminium (as Al) (mg/l)	0.2
7.	Free ammonia (as NH_3) (mg/l) Albuminoid ammonia (mg/l)	0.06 0.15
8.	Anionic detergents (as MBAS (Methylene Blue Active Substances)) (mg/l)	0.2
9.	Calcium (as Ca) (mg/l)	100
10.	Chloride (as Cl^-) (mg/l)	250
11.	Chemical Oxygen Demand (COD) (mg/l)	10
12.	Copper (as Cu) (mg/l)	1.0
13.	Fluoride (as F^-) (mg/l)	1.0
14.	Free residual Chlorine (mg/l)	1
15.	Iron (as Fe) (mg/l)*	0.3
16.	Manganese (as Mn) (mg/l)*	0.1
17.	Magnesium (as Mg) (mg/l) **	30
18.	Nitrate (as NO_3^-) (mg/l)	50
19.	Nitrite (as NO_2^-) (mg/l)	3
20.	Nickel (as Ni) (mg/l)	0.02
21.	Oil and grease (mg/l)	0.2
22.	Phenolic compounds (as C_6H_5OH) (mg/l)	0.001
23.	Sodium (as Na) (mg/l)	200
24.	Sulphate (as SO_4^{2-}) (mg/l) **	250
25.	Total alkalinity (as $CaC0_3$) (mg/l)	200
26.	Total dissolved solids (mg/l), (max.)	500
27.	Total hardness (as $CaC0_3$) (mg/l)	250
28.	Total Phosphates (as PO_4^{3-}) (mg/l)	2.0
29.	Zinc (as Zn) (mg/l)	3.0
30.	Arsenic (as As) (mg/l)	0.01
31.	Cadmium (as Cd) (mg/l)	0.003
32.	Chromium (as Cr) (mg/l)	0.05
33.	Cyanide (as CN^-) (mg/l)	0.05
34.	Lead (as Pb) (mg/l)	0.01
35.	Mercury (as Hg) (mg/l)	0.001
36.	Selenium (as Se) (mg/l)	0.01
37.	*E.coli* /100ml or thermo-tolerant coliform /100ml	Not detected
38.	Total Coliforms / 100 ml	(i) Shall not exceed 3 in any 100 ml sample (ii) Not detected in any two consecutive samples

Noise standards

The National Environmental (Noise Control) Regulations No.1, 1996 specifies the industrial noise pollution standards. The maximum permissible noise levels (as $L_{Acq}T$) at the boundary of the land in which the source of noise is located shall not exceed the limits as given below:

Table 1-5: Permissible Noise Levels in Accordance with Noise Control Regulations

Area	LAcq T, dB(A)	
	Day time	Night Time
Low Noise (Pradeshiya Sabha area)	55	45
Medium Noise (Municipal Council/Urban Council area)	63	50
High Noise (EPZZ of BOI & Industrial Estates approved under part IVC of the NEA)	70	60
Silent Zone (100 m from the boundary of a courthouse, hospital, public library, school, zoo, sacred areas and areas set apart for recreation or environmental purposes)	50	45

Note:
*"**LAeq T**" means the equivalent continuous, A-weighted sound pressure determined over a time interval T (in dB).*
***"day time"** from 06.00 hours to 18.00 hours, except for the purposes of construction activities where it means 06.00 hours to 21.00 hours.*
***"night time"** means from 18.00 hours to 06.00 hours except for the purposes of construction activities where it means 21.00 hours to 06.00 hours.*

Maximum permissible noise levels at boundaries of the land in which the source of noise is located in LAeq T for construction activities are as given below:

Table 1-6: Maximum Permissible Noise Levels for Construction activities

Day Time	Night Time
75	50

As per the regulation, the following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in the above table.

(a) For low noise areas in which the background noise level exceed or is marginal to the given level	Measured Background Noise Level +3dB (A)
(b) For medium noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3dB (A)
(c) For silent zone in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3dB (A)
(d) For high noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +5dB (A)
(i) For day time	
(ii) For night time	

1.4 Limitations and Data Gaps

This report presents the observations made by AECOM professionals based on the scope of work and agreed approach and methodology with MTD Walkers and ADB. The present report has been developed to identify the potential EHS and social issues and conditions associated with the activities of the project for which the assessment has been carried out. During the course of this assessment, AECOM has attempted to

independently assess the potential presence of EHS and social issues or conditions within the limits of the established scope of work as described in the contract between MTD Walkers and AECOM.

As with any assessment exercise, there is a certain degree of dependence upon verbal information provided by the point of contact for assessment, limited number of documents available for review and information available in the public domain, which is not readily verifiable. CAP developed for the facility constitutes a summary of the recommended actions, whereas a full description is presented in the body of this report on the nature of the findings, distinguishing between:

- Those aspects that could not be verified based on the available information; and
- Those areas in which non-compliance with respect to ADB Safeguard Policy Statement or Sri Lankan National Regulations was observed.

This report has been prepared by AECOM for the benefit of its client, MTD Walkers and SDB. AECOM's client may release the information to third parties, who may use and rely upon the information at their discretion. However, any use of or reliance upon the information by any party shall be solely at the risk of such party and without legal recourse against AECOM, its parent, its subsidiaries and affiliates; or their respective employees, officers, or directors; regardless of whether the action in which recovery of damages is sought is based upon contract, tort (including the sole, concurrent, or other negligence and strict liability of AECOM), statute, or otherwise. This information shall not be used or relied upon by a party that does not agree to be bound by the above statement.

The E&S Compliance Audit is largely based on the documents made available, and discussions with stake holder and observations from site walk through undertaken by AECOM professionals during the site visit. Wherever documentation, policies and procedures for evaluation were not available for review, it has been highlighted in the report at relevant sections. In addition, wherever AECOM has not been able to make a judgment or assess any process, it has been highlighted as an information gap and a way forward has been suggested.

1.5 Layout of the Report

The remaining sections of the report include the following:

- ***Section 2***: provides a description of the project, status of development of the ship repair yard, operation of workshop;
- ***Section 3***: reviews the status of compliance of the Project with respect to the ADB Safeguards and applicable reference framework; and
- ***Section 4***: provides a Corrective Action Plan (CAP) based on the gaps identified along with timeline for completion.

2.0 PROJECT DESCRIPTION

This section presents the details of the project and associated facilities, location of the site and surroundings as well as the status of various permits obtained for the project. Further details on the background of the company have also been presented in this section.

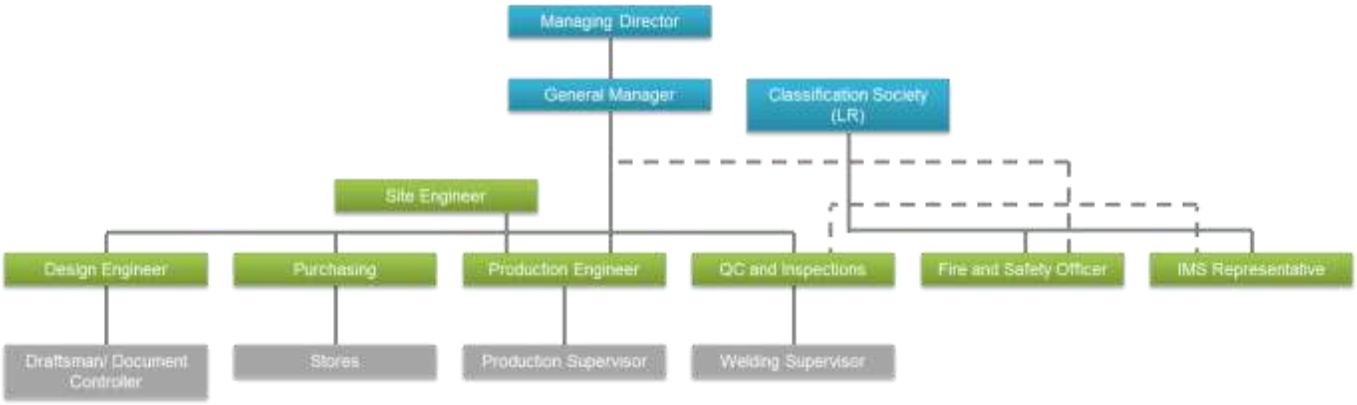
2.1 General Information of Company

The ship repair yard at Mutwal Fisheries Harbour, Colombo is being developed under Walkers Colombo Shipyard (Pvt.) Limited (WCS), which is a subsidiary of MTD Walkers PLC. The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., a ship repair and ship building entity that had entered into 25 year lease agreement with Ceylon Fishery Harbours Corporation to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015.

2.2 Organisation Structure

WCS is currently led by the CEO cum Managing Director who reports to the Board of Directors of MTD Walkers. The management at site is controlled and led by the General Manager. He is supported by a range of professionals across various departments such as Design Engineer, Production Engineer, Purchasing, Quality Control and Inspections. The Site Engineer of WCS is responsible for construction activities being undertaken at site. There is one Fire and Safety Officer at site who is responsible for ensuring safe practices at site, implementation of incident reporting system, work permit system and conducting training sessions and mock drills for construction phase employees and workers.

Figure 2-1: Current Organization Structure (Project Development Phase)



The various departments and the division of manpower for operation phase of the project is provided in Table below.

Table 2-1: Organizational Division of Manpower – Operation Phase

Division & Key Functions		Designation
Senior Management		MD/CEO
		DCEO
Operations Division	Ship repair, NBD Design & Construction	Head of Ship Repair, NBD Design & Construction
		Dock Master
		Ship Manager
		Engineer
		Design Engineer

Division & Key Functions		Designation
		Workshop/Machinery/Onboard Operation Engineer
		Subcontracting to CWS
	Yard Operations, Yard Development & External Coordination	Head of Yard Operations
		Operations/Crane & Ancillary Equipment staff
		Maintenance Manager
		Maintenance staff
Group Procurement	Service & Material, Procurement	Service Procurement Executive
		Material Procurement Executive
Commercial & Business Development Division	Commercial & Business Development (Ship repair & New Building)	Head of Commercial Business & Development (Ship Repair & New Building)
		Scheduling & fleet relationship team
		Descriptor
		Data Entering/Research Analyst
		Marketing & Estimation
		Invoicing Executive
		New Building Project Development Manager
Group Finance	Finance reporting	Accountant/ Assistant Accountant
		Cashier
Group Human Capital and Administration Division	HR & Administration	HR & Admin Manager
		Admin & Security Officer
		Personal Files & Salary Administration
Group Safety & Compliance Division	Safety & Compliance	Quality Controller
		Safety, Environmental & Fire Officer
		Fire Protection Staff
	Technical & Coordination	Engineer
		Management Accountant
		R & D Officer

2.3 Colombo Shipyard

2.3.1 Location and Site Settings

The Colombo shipyard is located in Colombo Division in Colombo District of the Western Province of Sri Lanka. The shipyard is situated within Mutwal Fishery Harbour, adjacent to the Colombo Port towards south west. The Mutwal Fishery Harbour is an existing harbour owned and managed by the Ceylon Fishery Harbours Corporation. The harbour provides berthing facilities for local and foreign fishing vessels.

The Colombo Port is situated at an aerial distance of 3 km from the proposed ship yard, towards south west. Several small houses belonging to the fishing community are situated immediately north of the site. There are few settlements immediately east of the site.

Figure 2-2: Indicative Location of Project

2.3.2 Proposed Facilities

WCS proposes to develop ship building and ship repair facilities at the Colombo shipyard, for vessels such as naval vessels (up to 65 m), fishing vessels, landing crafts, passenger vessels, works vessels and barges. Development works are under progress to provide floating repair services up to 80 m long vessels and dry berth repair services up to 42 m long vessels. The repair services will comprise engine repairs, hull renewal, electrical repairs, underwater repairs, maintenance of piping, maintenance and repair of on-board refrigeration and air-conditioning systems, propellers, rudders and shafts. WCS will also undertake design and building of new vessels (small and medium crafts) at the shipyard, including Naval Vessels, Landing crafts, Tug Boats, Anchor Handlers, Work Vessels and Passenger Vessels.

As per the Yard Capacity Plan, dated 8th September 2015, shared by WCS, the Colombo shipyard will comprise of following facilities:

a) Ship lifting and Transfer System

A ship life and transfer system of 1250 Tons capacity is being developed at the ship yard for dry repair of vessels. The total winch lifting capacity of the system will be 1900 Tons. The net lifting capacity will be 1600 tons and the nominal lifting capacity for platform will be 1300 tons. The lift and transfer system will consist of a platform with dimensions - 52 m length, 14.5 m width and average height of 1.25 m. The platform will be equipped with about eight (8) sets of winches, each with a maximum capacity of 240 tons. The ship lift system will be designed, manufactured, constructed and commissioned under Classification Society Rules.

The system will have capacity to lift vessels of up to 130,000 DWT. The repair pier can accommodate vessels of up to 42 m in length and up to seven (7) vessels can be repaired at any one point of time.

b) Boat lift and Slip way

For repair of small vessels and fishing boats, a boat lift with 50 Ton capacity will be developed along the existing breakwater. A slip way will be developed on the south east corner of the site, near the breakwater for facilitating the repair of small vessels.

c) Floating repair areas

The northern end of the existing pier of the Fishery Corporation will be repaired and redeveloped to be used as area for floating repairs of large and medium vessels. The shipyard will provide floating repair services for vessels up to 80 m in length.

d) Worker Accommodation and Office building

About 200 workers will be engaged for ship repair and building activities once the ship yard is fully operational. Accommodation will be provided to the workers at site. WCS has installed container units at site which are currently being used by the contractors as office space and also has canteen and toilet facilities for the construction workers. These container units will later be converted into accommodation and office for operation phase employees and workers.

The operational shipyard will have one security room at the main entry gate and two guard posts at the northern end of the pier to ensure round the clock security.

e) Workshop

A covered workshop will be constructed towards the south eastern end of the site.

Working Principle

The Ship Lift platform will be lowered and raised by hoists, driven by modular designed winches. The Electric/Electronic controlled double wire winches will be secured by triple break system. The winches will be driven by independent motors allowing continues seamless operations even if a single motor fails. The ship lift system will be operated by wire or a wireless remote control system.

The transfer system will consist of rail transporters and trestles. For docking a vessel, the trestles will be placed onto the platform with appropriate wood block to avoid any harm between trestles and the hull. The trestles will be arranged according to the docking plan, depending on the load curve. Tug boats will be used for mooring the vessel onto the submerged platform with trestle. The lift system will be activated and after lifting the vessel, the rail transporters will be driven under the trestles and the ship will be transferred to the repair pier. The launching system will also work in similar manner. The entire system will be remotely monitored and operated from the control room.

Layout and capacity plan of the Colombo ship yard is presented in Figure 2-3 below.

Figure 2-3: Layout of the Colombo Ship yard

2.3.3 Central Workshop

The Central Workshop under the Walkers and Sons Engineers (Pvt) Ltd is located at Sapugaskanda in Colombo Division, Colombo District of the Western Province of Sri Lanka. Plate and fabrication works related to construction of pressure vessels, and general fabrication work of machine components, radial gates for hydro projects and segments for tank farms are undertaken at the workshop. The standard product lines comprise of tea, rubber and sugarcane processing machinery. The Central Workshop will be a support facility to the shipyard as repair and maintenance works of vessels which involve general fabrication will be undertaken at the workshop.

As informed by MTD Walkers, the company has plans to shift the Central Workshop to an industrial area in Delkanda, owned by the State Engineering Corporation (SEC). The land within the SEC premises will be taken on lease by WCS. The process of entering into lease agreement is under progress. Work orders for structural works have been issued to contractors by WCS. Due to permission related issues, the land allocated for the workshop could not be surveyed as part of the assessment. The workshop relocation is expected to be complete by April 2017.

Following is the list of machine/ equipment available at the workshop:

Table 2-2: List of Equipment and Machinery – Central Workshop

Sl. No	Name of Machine	Specifications	Quantity
1.	AG500 CNC Plasma and flame cutting	• Max plate thickness -150 mm • Bed size - 14m x 5m	1
2.	Shot blasting machine	• Max plate width - 2 m • Max Plate Thickness- 25 mm • Both side blast at one time	1
3.	Lathe Machines	Ranging from: • Chuck size: 1” to 24" • No. of jaws: 3 to 4 • Bed Length: 3.5' to 27.5'	14
4.	Milling Machines	Bed size ranging from 3'x10" to 4'x10"	3
5.	Slotting Machine	Bed Size: 30" and Stroke: 17"	1
6.	Thread Cutting Machine	6” max. diameter	1
7.	Shaper Machine	Stroke 26”	1
8.	Boring	Chuck Size: 2-3’ Max Work Piece Diameter: 7-9’ Bed Length: 8-9.5’	3
9.	Hydraulic Press	200Tons	1
10.	Rolling Machine	10’ long roller	1
11.	Drilling machine	1' to 2.5’ stroke	3
12.	Sheering Machine	5/8" Max. Plate Thickness	1
13.	Circular grinder	5' bed length	1
14.	Planer Machine	4'x10’ Bed Size and 4' stroke	1
15.	Sheer Cutter	4-6’ cutting length and 3mm plate thickness	2

The workshop also has various sections such as cutting bay, prep and tacking section, lay-down and QA inspection area, completed spool storage with mobile crane facility, training centre and skills testing facility, and division for fabrication and assembly. In addition, the workshop consists of separate welding consumable store, materials control store, shop testing facilities, various welding machines and equipment, cutting and prep equipment, tea machines making machinery, arc welding plant (Nos 4), tig welding plant, stationary grinding

machines (Nos 3). The workshop also has one overhead crane of 5 Tons capacity and one Mobile Crane of 5 Tons capacity.

2.3.4 Current Status of Project

The construction activities for redevelopment of Colombo Shipyard have been initiated by WCS since June 2016 and it is expected to be completed by January 2017. Since the Mutwal Harbour has an existing pier, floating repairs of small and medium vessels and building of new vessels are already being undertaken at the site. Presently, around 150 workers are engaged at the site for floating repair activities.

On the day of visit, following development activities were observed to be in progress:

- Construction of 40 m deck barge by Walkers Engineering and Sons (Pvt.) Ltd. that was initiated in June 2016 was underway at site. Painting of the external hull was completed and welding works inside the barge were being carried out. The construction of the deck barge was expected be complete within one week from the day of visit.
- Construction of a 7 tons bollard work boat was underway. The tug boats are being built as per the standards of IRCLASS and WCS has entered into agreement with Indian Register of Shipping for this purpose on 9th February 2016.
- Piling works for the lifting platform were underway and were being undertaken by M/s Walkers Piling (Pvt) Ltd., which is a group company of MTD Walkers.
- Dredging was being undertaken at the site by Ceylon Fishery Harbour Corporation (CFHC) through dredger – Sayuru. Reportedly, about 70% dredging has been completed in the area. CHFC Dredger 'Sayuri' has been engaged to dredge about 35 loads of 300 cu.mts. at Mutwal Fisheries Harbour.

About eight (8) contractors have been engaged for the shipyard development works, details as provided below:

Table 2-3: List of Contractors Engaged – Colombo Shipyard

S. No.	Name of Contractor	Type of Works	No. of workers engaged (as on the day of audit)
1	Walkers Piling (Pvt) Ltd.	Piling	25
2	Walkers Engineering and Sons (Pvt.) Ltd.	Structural fabrication, general engineering and ship repairs	18
3	Sagar Marine	General engineering and ship repairs	10
4	Dolphin Marine	Steel fabrication, piping, repairs	10
5	Active Marine	Steel fabrication, piping, repairs	8
6	Mechcreate	Small scale civil works	8
7	Karunaratna Fabricators	Steel works	12 - 15
8	RTD Marine	Electrical works	5

Currently there is one office block at the site, which has around 25 personnel of WCS, including one (1) female employee. The contractors have their offices in the container units installed adjacent to the existing pier. The block also has canteen and toilet facilities for the construction workers. This container unit will later be converted into accommodation and office for operation phase employees and workers. Apart from this, the site also has a resting shed for the construction workers, store for storage of paints and chemicals, a covered and paved shed

being used as temporary workshop for undertaking welding and painting works, an open scrapyard and a security room at the entry.

2.4 Environment, Health, Safety and Social Management Systems

WCS intends to obtain certification under environment management systems (EMS), Health and safety management system (OHSAS) and quality management system (QMS) from LRQA. An Integrated Management System Manual has been developed by WCS for the Colombo shipyard operations and is yet to be implemented at site. The IMS manual is based on ISO 9001: 2008/ISO 14001:2004 / OHSAS 18001:2007 standards. The review of the procedures and their adequacy are covered in the ESMS gap assessment report submitted separately.

2.5 Status of Permits

The Colombo Shipyard is being developed within the existing Mutwal Harbour managed by Ceylon Fishery Harbour Corporation. Application for obtaining Permit for Development Activity (under Part –III, Section 14 of Coast Conservation Act No.57 of 1981) has been filed with the Coast Conservation Department (CCD) on 16th May 2016. However it was observed that following permits have **not** been obtained yet:

- Environment Protection License from Central Environmental Authority (CEA)
- Fire Safety Clearance from Fire Service Department
- Water Sanction and Drainage Certificate from Water and Drainage Department of the Municipal Council of Colombo
- Permission for Water Connection from Water Supply Board
- Electricity Permission from Ceylon Electricity Board

2.6 Project Categorization

The proposed project is classified as **Category B** as per Environmental Safeguards and **Category C** as per Involuntary Resettlement and Indigenous Peoples Safeguards, based on the following factors:

- The project is located within the existing Mutwal Harbour, already being used for docking of fishing boats, and does not bring about any land use change.
- The project will be implemented within sensitive natural environment, i.e. marine environment comprising of benthic flora and fauna and submerged reefs (although more than 1 km from the project area). This has to be taken care of as part of the harbour development.
- The project will generate waste water, waste oil and dust from grit/steel shot blasting. The impacts are small considering the kind of vessels to be handled and are proposed to be managed through an environmental management system being developed by WCS.
- The project does not involve any land acquisition and involuntary resettlement as the shipyard is located within the existing harbour premises. The project will also help in enhancing local employment.

3.0 DOCUMENT REVIEW AND ASSESSMENT OF COMPLIANCE

3.1 Environment Compliance

3.1.1 Air Pollution Management

ADB SPS Requirement

Policy Principle 9 of Environmental Safeguard: This policy principle mandates use of pollution prevention and control technologies and practices in line with international good practices as per World Bank's WB IFC EHS Guidelines (General and for Crude Oil and Petroleum Product Terminals) applicable for air emissions including VOCs and dust. The crux of this section stresses on avoiding pollution or minimizing or controlling the intensity of greenhouse gas generation.

Applicable Regulatory Requirement

- National Environmental (Ambient Air Quality) Regulations, 1994
- Coast Conservation Act No. 57 of 1981

Observations

1) During the site visit, construction activities were in progress at site. No diesel generator sets were observed at site and power was being sourced from the grid. However it was observed that construction of deck barge and one tug boat was under progress. Painting of the hull of the deck barge was partially complete and welding works were underway inside the barge. There were no major sources of emissions from the current activities, except for particulate matter and dust emissions. No air emission monitoring has been conducted at site till date for construction phase.

2) It was also informed that during operation phase special surface cleaning methods such as sponge jet and high pressure water blasting will primarily be used. However some amount of grit blasting will also be undertaken for maintenance of vessels as per the information provided by WCS. Grit blasting or abrasive blasting generally involves propelling very fine bits of abrasive material (such as sand, steel grit, copper slag) at high-velocity to clean or etch a surface. Further, the operations will also involve use of primers, paints, and coatings for vessel maintenance and building activities, though it was reported that painting activities will be undertaken in covered area. Such activities have the potential to generate dust and particulate matter that may contain high levels of toxic air contaminants and VOCs. WCS has not yet identified the sources of air emissions for operational activities and air emission monitoring plan has not yet been developed.

Gaps

1) Air emission monitoring has not been conducted at site for construction phase. WCS has not yet identified the sources of air emissions for operational activities and air emission monitoring plan has not yet been developed.

Recommendations

1) WCS should develop an air emissions monitoring plan for construction and operation phases. Air monitoring should be conducted periodically through third party laboratory to ensure compliance with the standards.

2) WCS shall make a commitment towards sponge grit blasting to be used for the operation phase. Temporary sheet barriers shall be used in areas where dust generation is expected.

3.1.2 Water and Waste Water Management

ADB SPS Requirement

Policy principle 9 of Environmental Safeguard: This policy principle mandates use of pollution prevention and control technologies and practices in line with international good practices as per World Bank's IFC EHS Guidelines applicable (General and for Ports, Harbors and Terminals) for wastewater management and consistent with MARPOL. The crux of this section stresses on avoiding pollution or minimizing or controlling the intensity of waste water generation.

Applicable Regulatory Requirement

- National Environmental Act (NEA) No. 47 of 1980 and subsequent amendments (1988, 1995, 1999 and 2000)
- Coast Conservation Act No. 57 of 1981
- Marine Pollution Prevention Act, No. 59 of 1981
- Sri Lanka Standards 721:1985 - Tolerance limits for industrial wastewater discharged into marine coastal waters
- Sri Lanka Standard SLS 614:2013 - Sri Lanka standard specification for potable water

Observations

1) Water is currently being used for construction activities, drinking purpose and in toilets by construction workers and site employees. Packaged drinking water is being procured for drinking purpose while remaining water is reportedly sourced from the Water Supply and Drainage Board. It was reported that about 20,000 litres per day is the permitted water usage at Colombo shipyard. It was further reported that about 10,000 litres of water will be required for hydro blasting activities during operation phase, apart from domestic usages. Exact quantity of water usage has not been estimated for the project. Records of water use are also not being maintained at site.

2) The toilets at site are connected to a septic tank, however the capacity of the same was not available with the site management. It was reported that for operation phase, WCS is in the process of designing a septic tank and soak pit system, hence the adequacy of the system could not be reviewed as part of assessment.

3) During site walkthrough, it was observed that painting of the external hull of deck barge was partially complete. Though shrouds were apparently provided, they were not fixed in proper manner. Droplets of paint were observed beneath the barge on the ground below, thus indicating potential contamination of marine water. At the time of assessment, it was reported that floating repairs of small vessels were being undertaken at the site. Such repairs involve generation of wastewater discharges containing antifouling paint hull coatings, sacrificial anodes, motor exhaust, and hazardous material spills. Vessels requiring maintenance and overhaul work also carry bilge and contaminated ballast water that needs to be disposed of properly. However no mechanism existed at the shipyard for collection and treatment of wastewater from vessels repair activities. Further, it was understood during discussions with the WCS management that effluent treatment system has not been proposed for the operation phase of the project.

4) Dredging activities were also underway on the day of assessment. WCS has awarded dredging works to the Ceylon Fishery Harbour Corporation (CFHC). Dredger 'Sayuru' was engaged for the purpose on the day of assessment. During dredging operation, there is potential of water contamination due to spillage of oil, grease, machine oil, etc. from the dredging equipment. However there is no oil spill management plan has been prepared by WCS. Monitoring of marine water quality is not being undertaken at the shipyard. No plan has been developed to monitor and control marine water pollution as per the statutory requirements.

Gaps

1) Though it was reported that currently water is being sourced from Water Supply and Drainage Board, no permission was available for review. Hence it is inferred that no formal permission has been sought from the Board.

2) Capacity of existing septic tank is not known. Further, the septic tank - soak pit system design for operation phase was not available for review.

3) Floating repairs are randomly undertaken at the site, along with development works, however WCS has not yet obtained permission from CCD to initiate such operations. Further, there is no wastewater collection and treatment system provided at site to manage the hazardous substances generated during such repair activities.

4) Effluent treatment system has not been proposed for the operation phase of the project.

5) WCS has not developed an oil spill management plan for construction and operation phases of the shipyard. Oil spill containment and clean up materials were not available at site.

6) Monitoring of marine water quality is not being undertaken at the shipyard. No plan has been developed to monitor and control marine water pollution as per the statutory requirements.

Recommendations

1) WCS should obtain permission from the Water Supply and Drainage Board for supply and use of water for construction and operational activities at the shipyard.

2) Septic tank details to be obtained and ensured that the domestic sewage does not seep and contaminate soil and groundwater. The design of the operation phase septic tank and soak pit system should be assessed and reviewed by a third party for adequacy and efficiency, prior to installation. The suitability of septic tank-soak pit arrangement shall also consider the ground water levels and potential for contamination, considering the proximity to sea.

3) WCS should design and implement collection and treatment system for the wastewater (including bilge and contaminated ballast water from vessels) generated from the floating repair activities currently being undertaken at site. It should be ensured that none of the wastewater is discharged directly into the marine environment. Floating repairs shall not be undertaken unless such mechanisms are in place.

4) An effluent collection and treatment plant should be designed and installed for the operation phase of the project. Bilge and contaminated ballast water from the incoming vessels should be collected in holding tanks and treated prior to discharge into the sea. The quality of treated effluent should be tested to ensure compliance to discharge standards. WCS shall make a commitment towards installation of an effluent collection and treatment plant as part of its project plan.

5) WCS should develop an oil spill management plan for handling any oil or chemical spills at site during repair activities. Oil spill containment and clean-up materials should be kept at site for spill emergencies to limit the spread of contamination (e.g. containment booms, recovery devices, and oil recovery or dispersant application vessels). The spill kit shall be ready and available during the construction phase.

6) It is recommended that WCS should periodically monitor the quality of marine water in the harbour area.

3.1.3 Noise Pollution Management

ADB SPS Requirement

Policy principle 9 of Environmental Safeguard: This policy principle mandates use of pollution prevention and control technologies and practices in line with international good practices as per World Bank IFC EHS General Guidelines.

Applicable Regulatory Requirement

- National Environmental (Noise Control) Regulations No.1 1996

Observations

1) Various noise generating activities were underway at the site including piling and dredging. It was observed that workers engaged at site were not provided with ear muffs and ear plugs. Piling activities also result in vibration which might pose at disturbance to the surrounding community, though it was reported that such activities are not undertaken at night time. Operation phase will also result in significant noise generation due to vessel movement, maintenance workshop, use of pneumatic hammers, gouging tools, chipping machines and grit blasting activities. WCS has not developed grievance redressal mechanism for receiving complaints from the surrounding community in case of disturbance due to noise and vibrations from site activities. Moreover, WCS does not monitor the ambient noise levels at site and surrounding areas to ensure compliance with the standards.

Gaps

1) Ambient noise level monitoring has not been conducted at site as there are habitations in close vicinity.

2) Workers are not provided with adequate PPE such as ear muff and ear plugs.

3) Grievance redressal mechanism not developed to receive and resolve complaints related to noise and vibration from the surrounding communities.

Recommendations

1) WCS should undertake ambient noise level monitoring at onsite and offsite locations to understand the noise levels in the area and ensure that ambient noise levels at the boundary of the site are within the regulatory standards.

2) Temporary noise barriers shall be provided while working close to habitations, also heavy noise generating works shall be restricted to day time.

3) WCS should ensure that all construction workers undertaking high noise generating activities are provided with ear muff and ear plugs with specifications in accordance with AS/NZS 1270.

4) WCS should develop a grievance redressal mechanism for the community to receive and resolve complaints related to noise and vibration. A grievance register should be maintained at site to receive complaints and contact number of key site personnel should also be displayed at the main gate.

3.1.4 Waste Management

ADB SPS Requirement

Policy principle 9 of Environmental Safeguard. This policy principle mandates use of pollution prevention and control technologies and practices in line with international good practices as per World Bank WB IFC EHS Guidelines applicable (General and for Ports, Harbors and Terminals) for waste management and consistent with MARPOL. The crux of this section stresses on avoiding pollution or minimizing or controlling the intensity of municipal and hazardous waste generation and avoiding use of banned hazardous material.

Applicable Regulatory Requirement

- National Environmental (Protection and Quality) Regulations, No. 1 of 2008.
- Tolerance Limits For Industrial And Domestic Waste Discharged Into Marine Coastal Areas (*List III, Schedule I of National Environmental (Protection and Quality) Regulations, No. 1 of 2008)*

Observations

1) Various types of wastes are generated at site during construction activities such as scrap metal, cables, paper, packaging material, empty paint cans and thinner bottles, empty grease and lubricant tins, oil and grease soaked cotton, waste gloves and other domestic wastes. Large metal buckets, bearing the label 'Scrap Bucket', have been provided at site, and about three such buckets were observed at the scrap yard containing mixed waste. Separate waste bins have not been provided for non-hazardous and hazardous wastes.

2) WCS has applied for permit from Coast Conservation Department. However, WCS has not obtained Environmental Protection License for emission and disposal of waste in accordance with the Regulation No. 1534/18 under National Environmental Act. The regulation specifies that no person shall, discharge, deposit or emit waste into the environment which cause or are likely to cause pollution except under the authority of a license issued by the Central Environmental Authority (CEA).

3) The existing Mutwal Harbour was equipped only to handle small fishing vessels, therefore in order to accommodate larger vessels, capital dredging activities up to 8 m depth is being undertaken at site. WCS has awarded dredging works to the Ceylon Fishery Harbour Corporation (CFHC), which reportedly has the exclusive mandate of undertaking dredging at harbours in Sri Lanka. CFHC is also the licensing authority for disposal of extracts. It was informed by WCS that the dredged material is disposed by CFHC at permissible areas beyond 5 nautical miles (nm) from the harbour limits. The boulders in the dredged material are reused by MTD Walkers for construction works, mainly for filling low lying areas. Similarly, Sri Lanka Land Reclamation and Development Corporation is assigned by WCS to dispose piling extracts in government permitted areas. The piling extracts are reportedly disposed at Muthurajawela Zonal, near Shell terminal, which is the nearest filling yard.

Gaps

1) WCS has not obtained Environmental Protection License from CEA for generation and disposal of waste in accordance with statutory requirements.

2) Segregation of waste is not practiced at site and single bins are provided for collection of hazardous and non-hazardous waste.

3) Although it was reported that waste generated at site is disposed through MEPA authorized vendors, agreement for the same was not available for review.

4) Records are not being maintained at site for generation and disposal of solid waste.

Recommendations

1) WCS should apply to the Central Environmental Authority (CEA) for obtaining Environmental Protection License for generation and disposal of waste in accordance with statutory requirements. All requirements laid down in the permit should be complied with.

2) As a good practice, WCS should provide separate bins for collection of hazardous and non-hazardous wastes generated at site. The bins should be labelled accordingly. The workers and employees should be trained adequately on the waste management practices.

3) WCS should ensure that all waste is disposed through MEPA registered waste service providers. WCS should identify such service providers in the area and enter into agreement with them for disposal of garbage and hazardous waste.

4) WCS is required to maintain waste generation and disposal records as per form set out in Schedule V of the Regulation. Annual return should be filed with the Authority in the form set out in Schedule VI of these regulations regarding the disposal of Scheduled waste.

3.1.5 Biodiversity and Sustainable Natural Resources Management

ADB SPS Requirement

Policy principle 8 of Environmental Safeguard. This policy principle states that a new project shall not be planned/ implemented in critical areas unless the adverse impacts are either absent or mitigated to the required degree and it poses no threat to the population of any recognized endangered or critically endangered species. It further mandates implementation of additional programs to conserve legally protected area (if any). Further, it mandates that natural habitats must be conserved and protected from degradation.

Applicable Regulatory Requirement

- Coast Conservation Act No. 57 of 1981
- Marine Pollution Prevention Act, No.59 of 1981

Observations

1) The shipyard site and its surrounding areas are not identified as a sanctuary or eco-sensitive area. The area is not part of any of the identified marine protected areas (MPA) of Sri Lanka[1]. Further, no diversion of forest land is involved in the project.

2) The shipyard is being developed at the existing Mutwal Fishery Harbour, which provides berthing facilities for fishing crafts. Development of the shipyard is therefore not expected to have significant impacts on the marine flora and fauna of the area. However WCS has not conducted any risk assessment study to identify the impacts of the project construction and operation activities on the marine ecology of the area.

3) WCS has applied for Permit for Development Activity (under Part –III, Section 14 of Coast Conservation Act No.57 of 1981) from Coast Conservation Department via application dated 16th May 2016. However the permit has not yet been obtained for the project.

Gaps

1) WCS has not conducted any risk assessment study to identify the impacts of the project construction and operation activities on the marine ecology of the area.

Recommendations

1) WCS should undertake a risk/ impact assessment study to identify the impacts on the marine ecology of the project area, i.e. proposed dredging area within the existing Mutwal harbor and incoming vessel berthing areas, due to project construction and operation activities. The impact assessment should cover status of existing marine flora and fauna and related benthic habitats and communities. Mitigation measures should be formulated commensurate with the identified impacts and if required, a marine ecology management plan should be devised and implemented at site for both phases of the project. An assessment of impacts as part of an IEE reports shall be prepared.

3.2 Health and Safety Compliance

ADB SPS Requirement

Policy principle 10 of Environmental Safeguard: This policy principle stresses on the importance of providing safe and healthy working conditions to prevent accidents, injuries and disease. It asserts on the establishment of emergency preparedness and response measures to avoid or minimize risks to health and safety of individuals and communities.

Social Protection Strategy: The strategy recommends the project proponent to provide safe and healthy working environment for its employees and its contractors/ subcontractors comply with the national labour laws and take measures to comply with the core labour standards. It stresses on accounting for risks inherent to the project activities by identifying hazards, providing preventive and protective measures and trainings to staff, documenting near miss incidents and accidents and an Emergency Response Plan (ERP) to handle potential emergencies. The SPS mandates that the identified Occupational health and safety issues must be identified, assessed, and addressed in an EIA for proposed projects.

Applicable Regulatory Requirement

- Factories Ordinance No. 45 of 1942
- Ports (Ship Repairing) Regulation, 1982
- Motor Traffic Act, No.14 of 1951

[1] http://boblme.reefbase.org/pdf/Marine%20Protected%20Areas%20-%20Sri%20Lanka.pdf

- Electricity Act No.19 of 1950
- Board of Investment (BOI) of Sri Lanka Act No. 4 of 1978

Observations

Following observations were made with respect to health and safety conditions at the shipyard:

1) ***Hot Work:*** Hot work such as welding and gas cutting was observed being carried out during the site visit at Colombo Shipyard. For gas cutting operations, acetylene and oxygen compressed gas cylinders are used. The gas cutting set was observed to be provided with flashback arrestors (non-return valve) at the torch end whereas the cylinder end was not provided with flashback arrestor. Additionally, at multiple locations the pressure gauges provided to the acetylene and oxygen gas cylinders were noted broken/damaged. The hose pipe provided to the gas cutting sets were in good condition largely and industrial clamps were noted used for connecting the hoses to cylinders. Welding machines lugs were observed broken and the grounding connections provided to the welding end was connected to a metal rod. Gas cylinders storage area was provided and largely, the cylinders were used and stored in upright position. However, few instances of gas cylinders in-use were noted stored in horizontal position. Procedure for use of pre-use inspection checklist before deploying equipment for use has not been developed and implemented.

2) Hot work permit is used for undertaking hot works on site. As per review of the permit dated 26 July 2016 for hot works at barge, it was noted that the permit is valid for a day and the same permit is reissued the next day by the permit controller. The review of permit conditions is only undertaken only the first time the permit is issued. The check-points provided in the permit system do not identify hot works in confined spaces and special requirements that may be required for working in such conditions. Additionally, the permit does not have requirement for pre-use inspection of equipment.

3) ***Electrical Safety*****:** Dedicated earthing connections could not be traced during the site visit. Earth test for earthing pits has not been undertaken. Continuity and traceability could not be established during the assessment. Danger signs and voltage labels were noted provided to electrical distribution boards. Labels were however, combustible in nature. All distribution boards were provided with 32mA Residual Current Circuit Breaker (RCCB) and were noted to be in working conditions. Distribution boards were not provided with rubber insulation mats and instances of use of single insulated wires were noted.

4) ***Fire & Life Safety:*** It was observed that no smoking policy has been implemented at the site. Nineteen (19) fire extinguishers (11 CO2, 4 water based and 4 dry powder based) were adequately provided at the site. Smoke detectors were also provided in the office area. The site management has plans for installation of fire hydrant system with 45 bar pressure, available at five points provided with fire hoses with a length of 12.5m each (covering the shipyard area adequately). However, the site management has not obtained Fire Safety Clearance from Fire Service Department, Colombo. Firefighting training is provided by Site Safety Officer on annual basis and till date only one emergency evacuation and fire drill has been conducted on 10th Feb 2016. However, it was informed that safety officer is the only trained fire fighter. The facility does not engage third party for training for fire response for example local firefighting authorities.

5) ***Hazardous Chemical:*** It was observed that Acetone (50 L) and Thinner (31 containers of 20 l each) were stored in a shipping container at site. The container was provided with one frame axial exhaust fan which was not provided with intrinsically safe fittings. Fire extinguishers were provided inside the shipping container. Spill management procedure and Material Safety Data Sheets or Safety Data Sheets (MSDS or SDS) has not been displayed at the container. Hazardous Waste (used PPE and oil contaminated gloves, etc) were noted stored near the shipping container. The shipping container was in lock condition during the assessment but the location can be accessed by Fishing Harbour employees/workers due to its proximity to the loading/unloading area of Fishing Harbour. Additionally, 'No Smoking' signage was not provided to the location. Paints, thinners, and acetone were also noted at undesignated locations during the site walkthrough. '

6) ***Lifting tools and tackles:*** During the walkthrough, chain pulley blocks of unknown tonnage, cranes, slings and lifting chains were noted used at the construction site. The site management has not prepared a register of lifting tools and tackles with UIN/UIDs corresponding to safe load tests. Safe load tests for lifting tools and tackles were reported not undertaken. Procedure for discarding broken/ damaged slings/ ropes/ chains has not been identified and implemented.

7) ***Confined Space Entry:*** Confined space entry procedure has not been developed and implemented. Hot work permit issued at site controls hot work in confined space only. During the assessment, confined spaces such as barge and vessel construction, was noted wherein hot work and painting activities were carried out. Gas monitoring is not undertaken before entry to confined spaces. Motorised centrifugal impellers for evacuation of fumes from the closed barge in which welding works were undertaken were noted provided. Access to confined space was through a ladder. The site management does not have procedure and equipment for evacuation of workers from the confined space in case of an emergency. Signalling/communication mode is not established for confined spaces works. Workers are only provided with dust masks to work in confined spaces with hard hats, face shields, and safety shoes.

8) ***General Housekeeping:*** General housekeeping at the Colombo shipyard was inadequate. General material were noted stored at undesignated places posing slip or trip hazard. Scaffolding structure provided to the barge construction was provided with access/egress platform which was unstable. The scaffolding structure was also not provided with base plates that may result in unstable structures.

9) Incident Reporting System: Incident reporting and recording system is implemented at site. Incident records were reviewed, which include type of incident, type of injury, action taken, cause of injury and corrective action to be taken.

Following observations are made with respect to health and safety conditions at Central Workshop:

10) ***Hot Works:*** Welding, gas cutting and CNC Plasma and flame cutting operations are undertaken at the central workshop. Hot works are not permit controlled as these are general operations; however equipment review before use –especially handheld equipment, is not undertaken. For gas cutting operations, acetylene and oxygen compressed gas cylinders are used. The gas cutting sets were observed provided with flashback arrestors (non-return valve) at the torch end whereas the cylinder end was not provided with flashback arrestor. Additionally, at multiple locations the pressure gauges provided to the acetylene and oxygen gas cylinders were noted broken/damaged. The hose pipe provided to the gas cutting sets were in good condition largely and industrial clamps were noted used for connecting the hoses to cylinders. Workers undertaking hot work were provided with face shields; however, the assistants to the welders were not provided with any safety glasses/goggles.

11) Welding machines lugs were observed broken and the grounding connections provided to the welding end was connected to a metal rod. Gas cylinders storage area was provided and largely, the cylinders were used and stored in upright position. However, few instances of gas cylinders in-use were noted stored in horizontal position.

12) ***Electrical Safety:*** Earthing pits could not be located during the site visit. Electrical cables were noted to be provided with single insulations largely. Main distribution boards and switch boards were not provided with any hazard communication signage. Electrical panels were only provided with Miniature Circuit Breakers (MCBs) or Moulded Case Circuit Breaker (MCCBs) or electric fuses for over current protection. However, the facility does not have any RCCBs. Distribution boards were not provided with rubber insulation mats and instances of use of single insulated wires were noted. Electrical connections were provided without using any industrial plug tops and live wires were noted exposed due to frayed insulations.

13) ***Fire and Life Safety:*** Central Workshop was provided with six (6) fire extinguishers though fire hydrant system was not provided. Fire extinguishers were few in numbers and were of CO_2 type only. The fire extinguishers were reportedly tested and refilled every 2 years by M/s Firing & Fire Services. Training on firefighting is not provided and mock drills are not conducted. The facility does not have any trained firefighters. First aid box was provided in the store. No trained first aiders are present in the facility.

14) ***Hazardous Chemicals:*** Corrugated asbestos cement sheet and asbestos ropes at Central Workshop was noted. The site management has not evaluated if the said material has significant levels of asbestos containing material (ACM) which can be harmful in case of human exposure. The facility has one diesel generator set, nearly 15 years old. One small area has been designated as the fuel storage room. Fresh diesel is stored in 30 litre cans, without secondary containment. Empty diesel barrels were also observed and it was reported that the diesel is procured from petrol pumps on need basis.

15) ***Lifting Tools and Tackles:*** During the walkthrough, chain pulley blocks of unknown tonnage, cranes, slings and lifting chains were noted. The site management has not prepared a register of lifting tools and tackles with UIN/UIDs corresponding to safe load tests. Safe load tests for lifting tools and tackles were reported not undertaken. Procedure for discarding broken/damaged slings/ropes/chains has not been identified and implemented. The facility has one Overhead Crane (OHC) of capacity 5 tons and one mobile crane of 5 tons capacity. The safe load test of the OHC and mobile crane has not been undertaken. The safe load was also not displayed on the equipment.

16) ***General Housekeeping:*** General housekeeping was inadequate. General material were noted stored at undesignated places posing slip or trip hazard.

17) ***Machine Guarding:*** Central workshop has lathe machines, milling machines, sheer cutter, grinders, drilling equipment, hydraulic press, etc. The moving and rotating parts of the machines were not provided with machine guarding.

18) ***Incident Reporting System:*** There is no formal incident reporting and recording system at the facility. Incidents are verbally reported to the Supervisor and in case medical assistance is required, the workers are taken to the nearest hospital, about 2 km from the facility. Accidents wherein medical assistance has been sought was recorded in the accidents register, however there is no practice of recording the near misses and their cause of occurrence.

Gaps

The gaps identified with respect to occupational health and safety at the shipyard is given below:

1) Hot Work
    a. Cylinder end of gas cutting set not provided with flashback arrestor.
    b. Pressure gauges provided to the acetylene and oxygen gas cylinders were noted broken/ damaged
    c. Welding machines lugs were observed broken and the grounding connections provided to the welding end was connected to a metal rod.
    d. Procedure for use of pre-use inspection checklist before deploying equipment for use has not been developed and implemented.
    e. Hot work permits system implemented at site is not adequate.

2) Electrical Safety
    a. Dedicated earthing connections not provided for heavy machinery and equipment. Earth test for earthing pits has not been undertaken.
    b. Danger signs and voltage labels were combustible in nature.
    c. Distribution boards were not provided with rubber insulation mats and instances of use of single insulated wires were noted.

3) Fire and Life Safety
    a. Site management has not obtained Fire Safety Clearance from Fire Service Department, Colombo.
    b. Facility does not engage third party for training for fire response for example local firefighting authorities.

4) Hazardous Chemical
    a. The shipping container storing acetone and thinner was provided with one frame axial exhaust fan which was not provided with intrinsically safe fittings. The shipping container location was accessible to Fishing Harbour employees/workers due to its proximity to the loading/unloading area of Fishing Harbour. ‘No Smoking’ signage was not provided to the location. Paints, thinners, and acetone were also noted at undesignated locations during the site walkthrough.
    b. Spill management procedure and Material Safety Data Sheets or Safety Data Sheets (MSDS or SDS) has not been displayed at the container.

5) Lifting Tools and Tackles
    a. The site management has not prepared register of lifting tools and tackles with UIN/UIDs corresponding to safe load tests. Safe load tests for lifting tools and tackles were reported not undertaken.

b. Procedure for discarding broken/damaged slings/ropes/chains has not been identified and implemented.

6) Confined Space Entry
   a. Confined space entry procedure has not been developed and implemented. Work permit system do not include issue of work permits for confined space entry. Gas monitoring is not undertaken before entry to confined spaces.
   b. The site management does not have procedure and equipment for evacuation of workers from the confined space in case of an emergency. Signalling/communication mode is not established for confined spaces works.

The gaps identified with respect to occupational health and safety at the Central Workshop is given below:

7) Hot Work
   a. Equipment review before use –especially handheld equipment, is not undertaken.
   b. Cylinder end of gas cutting set not provided with flashback arrestor.
   c. Pressure gauges provided to the acetylene and oxygen gas cylinders were noted broken/damaged
   d. Assistants to the welders were not provided with any safety glasses/goggles
   e. Welding machines lugs were observed broken and the grounding connections provided to the welding end was connected to a metal rod.
   f. Few instances of gas cylinders in-use were noted stored in horizontal position.

8) Electrical Safety
   a. Earthing pits could not be located.
   b. Main distribution boards and switch boards were not provided with any hazard communication signage.
   c. The facility does not have any RCCBs.
   d. Distribution boards were not provided with rubber insulation mats and instances of use of single insulated wires were noted.
   e. Electrical cables were noted to be provided with single insulations largely. Electrical connections were provided without using any industrial plugtops and live wires were noted exposed due to frayed insulations.

9) Fire and Life Safety
   a. Fire hydrant system was not provided to the Central Workshop. Fire extinguishers were few in numbers and were of CO2 type only.
   b. Training on firefighting is not provided. The facility does not have any trained firefighters.

10) Hazardous Chemical
   a. Corrugated asbestos cement sheet and asbestos ropes was noted. Exposure based evaluation of ACM not undertaken
   b. Fuel storage area not provided with secondary containment.

11) Lifting Tools and Tackles
   a. The site management has not prepared register of lifting tools and tackles with UIN/UIDs corresponding to safe load tests.
   b. Safe load tests for lifting tools and tackles were reported not undertaken. The safe load was also not displayed on the equipment.
   c. Procedure for discarding broken/damaged slings/ropes/chains has not been identified and implemented.

12) Machine Guarding
   a. The moving and rotating parts of the machines were not provided with machine guarding.

Recommendations

Following recommendations are made against the gaps identified at the Colombo shipyard:

1) Hot Work

a. Gas cutting sets should be provided with flashback arrestors at torch and cylinder-end.
b. Pressure gauges on acetylene and oxygen gas cylinders should be in working condition.
c. Welding machines should have dedicated grounding connections connected properly to earth cables. Welding machines lugs should be industrial and should be in god condition at all times. Frayed lugs and cables shall be replaced immediately.
d. Develop a pre-use inspection checklist of equipment which shall be filled on daily before use of equipment.
e. For construction works, Hot Work Permit shall be developed and implemented which should adequately address requirements with respect to pre-use inspection, daily permit conditions evaluation, gas cylinders management, etc.

2) Electrical Safety
   a. Provide dedicated earthing pits for heavy machinery/equipment and distribution board with high voltage. Earth pits to have unique identification numbers and to be tested annually for its resistance and continuity. Physical traceability of the earth connections to be ensured for all earth pits.
   b. The labels provided to distribution boards to be non-combustible in nature
   c. Provide rubber mats to distribution boards for workers working on the distribution boards.

3) Fire and Life Safety
   a. Obtain Fire Safety Clearance from Fiore Service Department, Colombo.
   b. Engage with local firefighting authorities for training on response from external agencies.

4) Hazardous Chemical
   a. The shipping container for storage of thinners, acetone and paint to be stored at designated location with firefighting equipment, MSDS/SDS display, 'No Smoking' signage and spill response kit.
   b. The shipping container used for storage of thinner and acetone to be well ventilated. Forced ventilation and light arrangements, if any, provided to the storage shall be intrinsically safe. The storage should be provided with access control and proper signages. Hazardous waste and other combustible/flammable material should be stored away from the flammable material storage.

5) Lifting Tools and Tackles
   a. Undertake Safe Load Tests for all lifting tools and tackles including, slings, chains and lifting ropes. All lifting tools and tackles to be provided with UIN/UIDs.
   b. Procedure for discarding unsafe/damaged slings/ropes/chains to be developed and implemented. Tagging of safe equipment to be used shall be undertaken.

6) Confined Space Entry
   a. Develop a permit to work system for confined space entry. The permit should evaluate the requirement of various types of PPEs for working in such area, evacuation & communication procedures, gas monitoring before entry and Self Contained Breathing Apparatus (SCBA) for assistance in case of emergencies. Confined Space entrants to be trained thoroughly on all procedures and records to be maintained.

Following recommendations are made against the gaps identified at the Central Workshop:

7) Hot Work
   a. Plasma cutting area to be secluded with access control.
   b. Gas cutting sets should be provided with flashback arrestors at torch and cylinder-end.
   c. Pressure gauges on acetylene and oxygen gas cylinders should be in working condition.
   d. PPEs such as welding glasses should be provided for assistant/helpers.
   e. Welding machines should have dedicated grounding connections connected properly to earth cables. Welding machines lugs should be industrial and should be in god condition at all times. Frayed lugs and cables shall be replaced immediately.
   f. All gas cylinders in-use should be stored in horizontal position.

8) Electrical Safety

a. Provide dedicated earthing pits for heavy machinery/equipment and distribution board with high voltage. Earth pits to have unique identification numbers and to be tested annually for its resistance and continuity. Physical traceability of the earth connections to be ensured for all earth pits.
b. Hazard communication labels should be provided to distribution boards and should be non-combustible in nature
c. RCCBs to be provided to all equipment/machineries which require manual intervention while being energized. Electrical Fuses to be replaced with MCCBs or circuit breakers.
d. Provide rubber mats to distribution boards for workers working on the distribution boards.
e. Electrical cables to be provided with industrial plug tops and all frayed insulation to be replaced with industrial insulation.

9) Fire and Life Safety
   a. Provide adequate numbers of fire extinguishers.
   b. Firefighters to be identified from the workforce and trained for firefighting

10) Hazardous Chemical
   a. Develop a policy on 'Asbestos Free Works'. Develop a procedure on ACM handling and disposal. Inventorise ACM at workplace and treat it as hazardous material. Any broken or damaged ACM to be disposed to authorised hazardous waste handler.
   b. Diesel storage area to be provided with secondary containment. The area should be well lit and have adequate ventilation.

11) Lifting Tools and Tackles
   a. Undertake Safe Load Tests for all lifting tools and tackles including, slings, chains and lifting ropes. All lifting tools and tackles to be provided with UIN/UIDs.
   b. Procedure for discarding unsafe/damaged slings/ropes/chains to be developed and implemented. Tagging of safe equipment to be used shall be undertaken.

12) Machine Guarding
   a. The moving and rotating parts of all the machines should be identified and provided with machine guarding to prevent accidental injuries to workers.

13) Incident reporting system
   a. An incident reporting and recording system should be developed at the facility. All incidents and near misses should be recorded and investigated. Corrective actions should be taken to prevent recurrence of injuries. A Safety Supervisor should be designated at the facility to look into the health and safety aspects.

3.3 Social Compliance

3.3.1 Land Acquisition & Involuntary Resettlement

ADB SPS Requirement

Policy principle 6 of Involuntary Resettlement Safeguards: The policy principles recommends on developing procedures in a transparent, consistent and equitable manner if the land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status.

Further, SPS Appendix 2 Safeguard Requirements 2: Involuntary Resettlement para 25 indicates that the client is encouraged to acquire land and other assets through a negotiated settlement wherever possible, based on meaningful consultation with affected persons, including those without legal title to assets. A negotiated settlement will offer adequate and fair price for land and/or other assets. The client will ensure that any negotiations with displaced persons openly address the risks of asymmetry of information and bargaining power of the parties involved in such transactions. For this purpose, the borrower/client will engage an independent external party to document the negotiation and settlement processes. The borrower/client will agree with ADB on consultation processes, policies, and laws that are applicable to such transactions; third-party validation;

mechanisms for calculating the replacement costs of land and other assets affected; and record-keeping requirements.

Applicable Regulatory Requirement

- State Lands Ordinance, No.8 of 1947

Observations

1) As per the lease agreement between Ceylon Fishery Harbours Corporation and Sea Gulf UK (Pvt.) Ltd., dated 14th November 2014, the ship repair yard is being developed on land marked Lot 1 situated within the premises of Mutwal Fishery Harbour. The harbour was being managed by Ceylon Fishery Harbours Corporation. The shipyard was initially proposed to be developed under Sea Gulf UK (Pvt.) Ltd., a ship repair and ship building entity that had entered into 25 year lease agreement with Ceylon Fishery Harbours Corporation to build and operate a ship repairing facility at Mutwal Fisheries Harbour. MTD Walkers acquired 90 percent stakes in Seagulf UK and incorporated the company as Walkers CML Marine (Pvt.) Ltd. on 29th July 2015, later changing the name to Walkers Colombo Shipyard (Pvt.) Ltd. on 30th September 2015. No additional land has been procured or is required to be procured for the project. There is no involuntary resettlement issues associated with the project.

2) The land on which the Central Workshop is being relocated is situated within an industrial complex owned by the State Engineering Corporation (SEC) and is surrounded by other industrial units. The land will be taken on lease by WCS from SEC and the process of executing the lease agreement is underway. There is no involuntary resettlement issues associated with the land procurement.

Gaps

There are no gaps relating to this aspect.

Recommendations

There are no recommendations relating to this aspect.

3.3.2 Stakeholder Engagement and Disclosure

ADB SPS Requirement

Policy principles 5 of Environmental Safeguards: Meaningful consultation should be carried out with affected people so that facilitation of their informed participation is determined. This includes the participation of women as well. Involvement of stakeholders including affected people and concerned non-government organizations early on in the project preparation stage and ensuring that their views and concerns are made known and acknowledged by the decision maker is necessary. It is imperative that this consultation process is carried on throughout the project cycle so that addressal of issues is ascertained.

ADB's Public Communication Policy (2011) lays down the aspect of engaging with stakeholders by facilitating dialogue with affected people and other interested stakeholders, including women, the poor, and other vulnerable groups, on information relating to environmental and social issues which shall be made available to them in a manner, form, and language(s) understandable to them and in an accessible place. The project proponents are supposed to ensure that relevant information about major changes to project scope and likely impacts is also shared with affected people and other interested stakeholders.

Applicable Regulatory Requirement

No regulations enforce the requirements under this aspect directly or indirectly.

Observations

3) On the day of the site assessment, consultations were undertaken with the fishing community residing near the project area. It was reported during informal discussions that the project has opened up

avenues in terms of generation of unskilled and semi-skilled employment opportunities for the local communities residing in the vicinity of the project area. In addition, it was stated that the project once operational would be beneficial for the fishing vessels that would require repair works. The community members were however, concerned about the noise that was being generated during the construction phase of the project and mentioned that mitigation measures should be adopted to reduce the noise levels.

4) Besides local communities, informal discussions were held with representatives of the Ceylon Fisheries Harbour Corporation wherein it was reported that the harbour being operational accommodated more than thirty (30) fishing vessels however, with only one shipyard existing and no repair facility within the vicinity, the fishing vessel owners faced a major problem. With the project coming up, they were of the opinion that this would benefit the fishing communities at large as the facility would accommodate around seven (07) vessels at one time which would drastically reduce the repair time period for each vessel.

5) It was reported by the Human Resource (HR) Head at the Group Level, that a Public Relation Officer has been appointed at each site to maintain relation with the external stakeholders and his contact details is provided to local communities residing within the vicinity of the project area. However, on the day of the site assessment, it was noted that no Public Relation Officer has yet been nominated for the Colombo project site area.

Gaps

1) Identification and mapping of stakeholders have not been undertaken at the site level.
2) No Public Relation Officer has been nominated at the site level.

Recommendations

1) Formal stakeholder engagement plan should be developed wherein stakeholder identification and mapping as per their interest and power influence levels are to be undertaken. Communication methods to be adopted including schedule of engagement of various stakeholders should be prepared and accordingly implemented on site. In addition, records of engagement process undertaken with activities should be regularly updated and maintained on site.

2) A Public Relation Officer should be appointed or nominated at the site level to maintain relationship with the external stakeholders. His contact details should be disseminated to the local communities residing within the vicinity of the project area. All communications disseminated and exchanged between the personnel and the communities should be documented and maintained on site.

3.3.3 Corporate Social Responsibility

ADB SPS Requirement

ADB's Social Protection Strategy (2001) extends its scope to social assistance and welfare service programs for the most vulnerable groups with no other means of adequate support.

Applicable Regulatory Requirement

No regulatory requirement enforce the requirements under this aspect directly or indirectly

Observations

1) As observed from MTD Walkers Group level website, the Company has developed a Social Responsibility Policy wherein it has been stated that the Company is conscious of the needs of the communities surrounding its operations and strives to assist the community members in the betterment of their livelihood and living conditions. Additionally, the Group also actively seeks out ways to enhance its social license to operate.

2) On review of the Annual Report of the Company, 2014-15, it was noted that the Company had allocated a sum of LKR 3.7 million for various activities such as disaster relief, local environmental awareness programmes, support for education, culture and sports and contribution towards community infrastructure development.

3) The Shipyard should develop plans for undertaking social responsibility activities in the communities within the vicinity of the project site. Prior to the planning process, a needs assessment by a third party is required to be undertaken. Accordingly, based on this report, plans should be formalised. A budget should be allocated every year for the activities and accordingly, monitoring and impact evaluation should be undertaken to assess whether the activities initiated have achieved maximum outreach and value to the community members.

Gaps

1) No Corporate Responsibility Plans have been formalised by the Corporate at the site level.

Recommendations

1) The Shipyard should develop plans for undertaking social responsibility activities in the communities within the vicinity of the project site. Prior to the planning process, a needs assessment is required to be undertaken by a third party. Accordingly, based on this report, plans should be formalised. A budget should be allocated every year for the activities and accordingly, monitoring and impact evaluation should be undertaken to assess whether the activities initiated have achieved maximum outreach and value to the community members.

3.3.4 Human Resource Management

ADB SPS Requirement

ADB's Social Protection Strategy (2001) The Social Protection Strategy states that ADB will comply with the Core Labour Standards when designing and implementing funding options. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.

Gender and Development Policy. The policy recognizes the need to improve the status of women and to promote their potential role in development practices. The strategy of the policy is based on the consideration of social justice and gender equity that investment in women is vital to achieving economic efficiency and growth.

Applicable Regulatory Requirement

- Shops and Office Employees Act, 1954
- Factories Ordinance, 1950
- National Child Protection Authority Act No. 50 of 1998
- 1939 No 48 Children and Young Persons Ordinance as amended
- 1956 No. 47 Employment of Women, Young Person and Children Act as amended by Act Nos; 43 of 1964, 29 of 1973, 32 of 1984 and the regulations made thereunder
- Maternity Benefit Ordinance, 1941
- Workmen Compensation Ordinannce, 1935
- Trade Union Ordinance, 1935
- Wages Board Ordinance, 1941
- Payment of Gratuity Act No. 12, 1983
- Privilege Leave (Private sector) Law No. 14 of 1976

Observations

Colombo Shipyard:

1) On the day of the site assessment, a total of twenty six (26) employees were engaged on site from WCS. In addition, there were a total of eight (08) contractors and approximately ninety nine (99) workers engaged on site by the WCS.
2) The workers work in from 8 a.m. to 5 p.m. with one (01) day weekly leave. Night shifts are only undertaken depending upon the work schedule and volume of work. The night shift takes place from 4.30 p.m. to 1.30 a.m. The general work time for the WCS employees is from 8 a.m. to 5 p.m., six (06) days a week with Sunday being an off day. Attendance registers are maintained on site for all employees and workers.
3) There are four (04) female employees on site as observed during the site visit. One (01) employee belongs to WCS and three (03) employees belong to project management consultant, M/s Unica, engaged by Walker Engineering and Sons. Separate toilet facilities have been provided to the female employees.
4) On site, for the workers there is a designated mess hall and canteen, toilets and changing rooms facilities provided. There are no workers accommodation provided on site for the workers.
5) MTD Walkers PLC has developed a Human Resource (HR) Manual at the corporate level wherein details of recruitment, selection and orientation of workers, performance evaluation, working hours, leaves and benefits, training and development and disciplinary matters have been discussed. Details of the HR Manual will be provided in *ESMS Gap Assessment Report*. It is to be noted that elements mentioned in the HR Manual and corrective actions mentioned in the *ESMS Gap Assessment Report* shall be applicable for the Colombo project site as well.
6) As per the Code of Conduct detailed in the HR Manual, it was observed that the Company prohibits religious, racial, sexual, age, gender or handicap discrimination and/or harassment. In addition, female employees are entitled to maternity leave as provided by the Shop and Office Employees Act, 1954 and Maternity Benefits Ordinance, 1941.
7) The Policy on Equal Opportunities developed as part of Walkers CML Group Sustainability Policies highlights the Group's continuous attempt in creating a safe and secure working environment for the employees in being productive, earning a fair income and develop their skill set regardless of race, gender, nationality, religion or any other factor.
8) The Policy on Child Labour developed by Walker CML Group stresses that the group has zero tolerance towards child labour and ensures that no instances shall occur in any of the project sites.
9) The Policy on Forced or Compulsory Labour developed by Walker CML Group details that the all employees of the Group are employed at their own will and not subject to force or coercion of any type related to work.
10) Four (4) security guards have been hired by WCS through M/s Karthik Securities. The guards work in two 12 hour shifts throughout the day. There are no armed guards at the site.

Central Workshop:

11) On the day of the site assessment, a total of fifty one (51) employees (all male) were engaged on site. All workers are on contractual basis and their contracts get renewed every year. There are no workers accommodation provided on site for the workers.
12) The workers work in one (01) shift from 8 a.m. to 5 p.m. with one (01) day weekly leave. While on Saturday, they work from 8 a.m. to 1 p.m. Night shifts also are undertaken depending upon the work schedule and volume of work. The night shift takes place from 4.30 p.m. to 1.30 a.m. Overtime work takes place depending on the work volume and schedule. It was reported that a worker can work for a maximum of 200 hours per month, i.e. 50 hours per week, including overtime. As per the Wages Board Ordinance, a normal working week should not exceed 48 hours, excluding 12 hours per week of overtime. Attendance registers are maintained on site for all workers.
13) Besides their basic pay, the workers get benefits such as employee provident fund (12%), employee trust fund (3%) and bonus. In addition, the workers are paid overtime wages which is 1.5 times per one normal hour.
14) On site, for the workers there is a designated mess hall and toilet facilities provided. Four (4) security guards have been deployed at site

Gaps

No gaps have been identified on this aspect.

Recommendations

1) Elements mentioned in the HR Manual and corrective actions mentioned in the ESMS Gap Assessment Report shall be applicable for the Colombo project site.

3.3.5 Grievance Redressal

ADB SPS Requirement

Policy principles 5 of Environmental Safeguards: This section asserts the establishment of a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.

Policy principles 2 of Involuntary Resettlement Safeguards: This section expresses the establishment of a grievance redressal mechanism to receive and facilitate resolution of the affected people's concerns by supporting the social and cultural institutions of displaced persons and their host population.

Applicable Regulatory Requirement

- Industrial Dispute Act (No. 43 of 1950) and amendments made therein

Observations

1) As observed during the site assessment, no formalised structure of grievance mechanism was available at site for the employees and contracted workers. Through informal discussions held with the contracted workers, it was noted that whenever they have any grievances they approach their Supervisor and accordingly he solves the issue or he informs WCS safety representative on site of the same and accordingly a solution is attained. The entire process is informal as no documentation in terms of maintenance of a grievance register was available on site. Similar observations were made at the central workshop wherein the workers approach their Supervisor and accordingly he solves the issue or he informs the Manager who accordingly relates it to the Human Resource Department of Walker Sons.
2) WCS has not developed a formalised grievance mechanism on site for the workers (direct and indirect).
3) In terms of grievances forwarded by communities residing within the vicinity of the project area, no formalised grievance mechanism has been developed. There was no designated representative on site that was responsible to receive grievances from the communities and discuss the same with concerned teams in order to draw out a solution.
4) There were no contact details of any designated personnel visible on site wherein community members and workers could contact if in case of grievances.

Gaps

1) No formalised grievance mechanism has been developed by WCS or Walker Sons (for the central workshop) at the site level.

Recommendations

1) Grievance Redressal Mechanism/ Procedure should be adequately and elaborately developed for the community and workers relating to the steps to follow in terms of redressal of grievances, time taken, anonymous grievance handling etc., as part of the IEE.
2) Grievance Box/ register should be placed at the entrance of the project site for the community. Additionally, formal records of communication with the community should be maintained at site.
3) Grievance Box/ register should be maintained on site for both direct and indirect workers with Grievance Officer's contact details visible to all at site. It should be ensured that the Grievance Officer's contact details shall be communicated to all workers during the induction period. In addition, the details of the Grievance Officer should also be disseminated to the local communities around the area.

3.3.6 Contractor Management

ADB SPS Requirement

Social Protection Strategy (2001): The strategy defines a set of policies and programs designed to reduce poverty and vulnerability by promoting efficient labour markets, diminishing people's exposure to risks, enhancing their capacity to protect themselves against hazards and interruption or loss of income. The strategy recognizes the vital role of the International Labour Organization's (ILO) charters and labour standards in supporting workers conditions of employment, occupational health and safety, community standards and more so with globalization.

It also states that ADB will comply with the Core Labor Standards when designing and implementing funding options. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.

Applicable Regulatory Requirement

- Employee Provident Fund (EPF) Act No. 15 of 1958
- Employee Trust Fund (ETF) Act No. 46 of 1980
- Business Names Statute No. 4 of 1990
- Workmen Compensation Ordinance, 1935

Observations

1) WCS does not have a formal contractor management procedure at present. The primary contractors engaged for structural engineering, civil and piling works are group companies of MTD Walkers. Other contractors are selected based on their past experience and technical expertise in their field of work. Quotations are invited by WCS from respective contractors and employee details are sought along with National Identification Code (NIC) of each employee. The NIC no. indicates the date of birth of the workers/ employees. Licenses including Certificate of Registration, EPF License, Workmen Compensation Insurance Policy are also verified. In case of welders being engaged at site by the contractor, WCS verifies the qualification certificates (i.e. Welder Performance Qualification (WPQ)) issued by authorized agency. Worker wage register is submitted by the contractors to Admin department of WCS. The EPF and ETF paid by respective contractors to the contract workers is checked by WCS before clearing dues of the contractors.

2) As part of its IMS Manual, WCS has developed a supplier/ contractor selection procedure, however the same has not yet been implemented at site.

Gaps

1) There is no system of evaluating the contractor's performance based on health and safety practices at site.

Recommendations

1) WCS should develop a performance evaluation procedure, wherein contractors should be evaluated on the basis of labour working conditions, health and safety compliances and labour law compliances. WCS should conduct periodic inspections and audits of contractors during the course of engagement to ensure that all regulatory requirements are complied with.

3.3.7 Scheduled Tribe/Indigenous People

ADB SPS Requirement

Indigenous Peoples Safeguard. The safeguard gets triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems or culture of Indigenous Peoples or affects the territories or natural or cultural resources that Indigenous Peoples own, use, occupy or claim as an ancestral domain or asset.

Applicable Regulatory Requirement

No regulatory requirement enforce the requirements under this aspect directly or indirectly

Observations

1) As observed during the site assessment no indigenous people or their territories are being directly or indirectly affected by the project activities.
2) The project area is being set up in an urban setting and through review of information available in the public domain it is noted that there are no presence of indigenous population residing within the vicinity of Colombo Fisheries Harbour area.

Gaps

There are no gaps relating to this aspect.

Recommendations

There are no recommendations relating to this aspect.

3.3.8 Cultural Heritage

ADB SPS Requirement

Policy principles 11 of Environmental Safeguards: It is essential to conserve physical cultural resources and avoid the destruction and destruction of them by using field based surveys that are conducted by qualified and experienced personals. By the provision of using 'chance find' procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation, the destruction of the cultural heritage can be avoided.

Applicable Regulatory Requirement

- Antiquities Ordinance No. 9 of 1940
- Antiquity (Amendment) Act No. 24 of 1998

Observations

1) The project is being developed within the existing Mutwal Fishery Harbour premises. There are no monuments of cultural significance in the immediate vicinity of the site. Moreover, the development activities do not involve any large scale excavation activities for which permission should be sought.

Gaps

There are no gaps relating to this aspect.

Recommendations

There are no recommendations relating to this aspect.

4.0 CORRECTIVE ACTION PLAN

The present section delineates the list of actions required to be undertaken by the management of MTD Walkers PLC to ensure closure of the gaps as identified in Section 3.0 of the report. The Corrective Action Plan is provided below with timelines, responsibilities and specific action items.

The gaps are categorised as red, orange and yellow flag issues based on the severity of impact on the EHS and Social aspect:

Flags	Remarks
Priority 1	essential improvements to ensure safe operation or legal compliance of the asset
Priority 2	desirable improvements with economic benefit or compliance with best practice
Priority 3	optional improvements with limited operational or economic benefit

Table 4-1: Corrective Action Plan – Colombo Shipyard

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
1.	Permits	1. Site is partially operational (floating repairs), however permission from CCD has not yet been obtained. 2. Following permits have not been obtained: ▪ Environment Protection License from Central Environmental Authority (CEA) ▪ Fire Safety Clearance from Fire Service Department ▪ Water Sanction and Drainage Certificate		1. All operational activities being undertaken at site should be immediately ceased till relevant permits are obtained from the regulatory authorities. 2. WCS should apply to the respective government agencies for obtaining the listed permits. All requirements laid down in the permits should be complied with.	Corporate Compliance Team - WCS	4 weeks prior to commencement of operations	For obtaining permits – USD 3000 - 4000

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
		from Water and Drainage Department of the Municipal Council of Colombo ▪ Permission for Water Connection from Water Supply and Drainage Board ▪ Electricity Permission from Ceylon Electricity Board					
3.	Air Pollution Management	1. Air emission monitoring not conducted at site for construction phase. 2. Air emission monitoring plan not yet developed for operations.		1. WCS should develop an air emissions monitoring plan for construction and operation phases. 2. Air monitoring should be conducted periodically through third party laboratory to ensure compliance with the standards. a. Twice during construction phase b. Twice a year during operation phase 3. WCS shall make a commitment towards sponge grit blasting to be used for the operation phase. Temporary sheet barriers shall be used in areas where dust generation is expected.	Site Engineer - WCS	1. Two (2) weeks prior to start of construction/ commencement of operation, respectively 2. During construction/ operation activities 3. During construction/ operation activities	1) Ambient air monitoring for: a. Construction phase: USD 2500 b. Operation phase: USD 5000 p.a. 2) Installation of temporary sheet barriers: USD 1000 - 2000
4.	Water and Waste Water Management	1. Existing septic tank capacity not known and design of operation phase septic tank		1. Septic tank details to be obtained and ensured that the domestic sewage does not seep	WCS Site Management	1. Septic tank adequacy assessment:	1) Septic Tank Adequacy assessment by third party:

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
		- soak pit system not available for review. 2. Wastewater collection and treatment system not provided at site to manage hazardous substances generated during floating repairs. 3. Effluent treatment system not proposed for operation phase. 4. Oil spill management plan for construction and operation phases not developed. Oil spill containment and clean up materials not provided. 5. Monitoring of marine water quality not undertaken.		and contaminate soil and groundwater. The design of the operation phase septic tank and soak pit system should be assessed and reviewed by a third party for adequacy and efficiency, prior to installation. The suitability of septic tank-soak pit arrangement shall also consider the ground water levels and potential for contamination, considering the proximity to sea. 2. Floating repair activities currently being undertaken at site should be stopped till permission is obtained. In addition, WCS should design and implement collection and treatment system for the wastewater (including bilge and contaminated ballast water from vessels) generated from such activities and none of the wastewater should be discharged directly into the marine environment. Floating repairs shall not be undertaken unless such mechanisms are in place. 3. An effluent collection and treatment plant should be designed and installed for the operation phase of the project. Bilge and contaminated ballast water from the incoming vessels		6 weeks prior to commencement of operation 2. Immediate 3. Six weeks prior to commencement of operations 4. 2 weeks prior to start of construction/ commencement of operations 5. During construction and operation phases	USD 5000 – 6000 2) Effluent Treatment Plant: USD 1,00,000 3) Treated effluent quality monitoring: USD 1000 p.a. 4) Provision of spill containment equipment: USD 25,000 5) Marine water quality monitoring for: a. Construction phase: USD 700 b. Operation phase: USD 700 p.a.

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				should be collected in holding tanks and treated prior to discharge into the sea. The quality of treated effluent should be tested to ensure compliance to discharge standards. WCS shall make a commitment towards installation of an effluent collection and treatment plant as part of its project plan. 4. WCS should develop an oil spill management plan for handling any oil or chemical spills at site during repair activities. Oil spill containment and clean-up materials should be kept at site for spill emergencies to limit the spread of contamination (e.g. containment booms, recovery devices, and oil recovery or dispersant application vessels). The spill kit shall be ready and available during the construction phase. 5. WCS should periodically monitor the quality of marine water in the harbour area at two locations – one near shore and one far shore. a. Twice during construction phase b. Twice a year during operation phase			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
6.	Noise Pollution Management	1. Ambient noise level monitoring not conducted at site. 2. Workers not provided with ear muff and ear plugs. 3. Grievance redressal mechanism not developed for surrounding community to receive noise and vibration related complaints.		1. WCS should undertake ambient noise level monitoring at onsite and offsite locations to understand the noise levels in the area and ensure that ambient noise levels at the boundary of the site are within the regulatory standards. a. Twice during construction phase b. Bi-annually during operation phase 2. Temporary noise barriers shall be provided while working close to habitations, also heavy noise generating works shall be restricted to daytime. 3. WCS should ensure that all construction workers undertaking high noise generating activities are provided with ear muff and ear plugs with specifications in accordance with AS/NZS 1270. 4. WCS should develop a grievance redressal mechanism for the community to receive and resolve complaints related to noise and vibration. A grievance register should be maintained at site to receive complaints and contact number of key site personnel should also be displayed at the main gate.	WCS Site Management – Safety Officer	1. During construction and operation phases 2. Two weeks prior to start of construction activities/ commencement of operations 3. At the start of construction activities 4. Two (2) weeks prior to start of construction activities	1) Noise monitoring for: a. Construction phase: USD 500 b. Operation phase: USD 500 p.a. 2) Provision of temporary noise barriers: USD 15000 3) PPE for workers: USD 600 – 700

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
7.	Waste Management	1. Segregation of waste not practiced at site; single bins are provided for collection of hazardous and non-hazardous waste. 2. Agreement with MEPA authorized vendors not available. 3. Records not being maintained at site for generation and disposal of solid waste.		1. WCS should provide separate bins for collection of hazardous and non-hazardous wastes generated at site. The bins should be labelled accordingly. The workers and employees should be trained adequately on the waste management practices. 2. WCS should ensure that all waste is disposed through MEPA registered waste service providers. WCS should identify such service providers in the area and enter into agreement with them for disposal of garbage and hazardous waste. 3. WCS is required to maintain waste generation and disposal records as per form set out in Schedule V of the Regulation. Annual return should be filed with the Authority in the form set out in Schedule VI of these regulations regarding the disposal of Scheduled waste.	WCS Site Management – Safety Officer	1. Two (2) weeks prior to start of construction activities, to be continued throughout construction phase 2. Four (4) weeks prior to start of construction activities 3. Throughout construction phase	1) Provision of bins for waste collection: USD 500 – 600 2) Waste disposal through registered vendors: USD 3000 – 5000 (annual fee)
8.	Biodiversity and Sustainable Natural Resources Management	1. No risk assessment study to identify the impacts of the project on the marine ecology.		1. WCS should undertake a risk/ impact assessment study to identify the impacts on the marine ecology of the project area, i.e. proposed dredging area within the existing Mutwal	WCS Site Management	1. Four (4) weeks prior to start of construction activities	Within existing budget and resources

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				harbor and incoming vessel berthing areas, due to project construction and operation activities. The impact assessment should cover status of existing marine flora and fauna and related benthic habitats and communities. Mitigation measures should be formulated commensurate with the identified impacts and if required, a marine ecology management plan should be devised and implemented at site for both phases of the project. An assessment of impacts as part of an IEE reports shall be prepared.			
9.	Occupational Health and Safety	1. Unsafe practices related to hot works, electrical safety, fire and life safety, hazardous chemical, lifting tools and tackles and confined space entry		1. Hot Work a. Gas cutting sets should be provided with flashback arrestors at torch and cylinder-end. b. Pressure gauges on acetylene and oxygen gas cylinders should be in working condition. c. Welding machines should have dedicated grounding connections connected properly to earth cables. Welding machines lugs should	WCS Site Management – Safety Officer	To be implemented during construction phase, tasks to be initiated at least 2 weeks prior to start of construction activities.	USD 10,000

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				be industrial and should be in god condition at all times. Frayed lugs and cables shall be replaced immediately. d. Develop a pre-use inspection checklist of equipment which shall be filled on daily before use of equipment. e. For construction works, Hot Work Permit shall be developed and implemented which should adequately address requirements with respect to pre-use inspection, daily permit conditions evaluation, gas cylinders management, etc. 2. Electrical Safety a. Provide dedicated earthing pits for heavy machinery/equipment and distribution board with high voltage. Earth pits to have unique identification numbers and to be tested annually for its resistance and continuity. Physical traceability of the earth			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				connections to be ensured for all earth pits. b. The labels provided to distribution boards to be non-combustible in nature c. Provide rubber mats to distribution boards for workers working on the distribution boards. 3. Fire and Life Safety a. Obtain Fire Safety Clearance from Fiore Service Department, Colombo. b. Engage with local firefighting authorities for training on response from external agencies. 4. Hazardous Chemical a. The shipping container for storage of thinners, acetone and paint to be stored at designated location with firefighting equipment, MSDS/SDS display, 'No Smoking' signage and spill response kit. b. The shipping container used for storage of thinner and acetone to be well ventilated.			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				Forced ventilation and light arrangements, if any, provided to the storage shall be intrinsically safe. The storage should be provided with access control and proper signages. Hazardous waste and other combustible/flammable material should be stored away from the flammable material storage. 5. Lifting Tools and Tackles a. Undertake Safe Load Tests for all lifting tools and tackles including, slings, chains and lifting ropes. All lifting tools and tackles to be provided with UIN/UIDs. b. Procedure for discarding unsafe/damaged slings/ropes/chains to be developed and implemented. Tagging of safe equipment to be used shall be undertaken. 6. Confined Space Entry a. Develop a permit to			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				work system for confined space entry. The permit should evaluate the requirement of various types of PPEs for working in such area, evacuation & communication procedures, gas monitoring before entry and Self Contained Breathing Apparatus (SCBA) for assistance in case of emergencies. Confined Space entrants to be trained thoroughly on all procedures and records to be maintained.			
10.	Stakeholder Engagement and Disclosure	1. Identification and mapping of stakeholders not undertaken at site level. 2. No Public Relation Officer has been nominated at site level.		1. Formal stakeholder engagement plan should be developed wherein stakeholder identification and mapping as per their interest and power influence levels are to be undertaken. Communication methods to be adopted including schedule of engagement of various stakeholders should be prepared and accordingly implemented on site. In addition, records of engagement process	Public Relations Officer	1. Four (4) weeks prior to commencement of operations 2. Immediate basis, prior to start of construction activities	Within existing budget and resources

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				undertaken with activities should be regularly updated and maintained on site. 2. A Public Relation Officer should be appointed or nominated at the site level to maintain relationship with the external stakeholders. His contact details should be disseminated to the local communities residing within the vicinity of the project area. All communications disseminated and exchanged between the personnel and the communities should be documented and maintained on site.			
11.	Corporate Social Responsibility	1. No Corporate Responsibility Plans have been formalised by the Corporate at the site level.		1. The Shipyard should develop plans for undertaking social responsibility activities in the communities within the vicinity of the project site. Prior to the planning process, a needs assessment is required to be undertaken by a third party. Accordingly, based on this report, plans should be formalised. A budget should be allocated every year for the activities and accordingly, monitoring and impact evaluation should be undertaken to assess whether the activities initiated have achieved maximum	WCS Corporate team	1. Need assessment study to be completed 8 weeks prior to commence ment of operations	Need assessment study by third party: USD 5000 - 6000

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				outreach and value to the community members.			
12.	Grievance Redressal	1. No formalised grievance mechanism has been developed by WCS at the site level.		1. Grievance Mechanism Procedure should be adequately and elaborately developed for the community and workers relating to the steps to follow in terms of redressal of grievances, time taken, anonymous grievance handling etc. 2. Grievance Box/ register should be placed at the entrance of the project site for the community. Additionally, formal records of communication with the community should be maintained at site. 3. Grievance Box/ register should be maintained on site for both direct and indirect workers with Grievance Officer's contact details visible to all at site. It should be ensured that the Grievance Officer's contact details shall be communicated to all workers during the induction period. In addition, the details of the Grievance Officer should also be disseminated to the local communities around the area.	WCS HR team	1. GRM to be developed and implemented on immediate basis prior to start of construction activities 2. On immediate basis 3. Throughout construction and operation phases	Within existing budget and resources
13.	Contractor	1. There is no system of evaluating the contractor's		1. WCS should develop a performance evaluation	WCS Purchasing	1. Six (6) weeks prior	Within existing budget and

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
	Management	performance based on health and safety practices at site.		procedure, wherein contractors should be evaluated on the basis of labour working conditions, health and safety compliances and labour law compliances. WCS should conduct periodic inspections and audits of contractors during the course of engagement to ensure that all regulatory requirements are complied with.	team	to start of construction activities	resources

Table 4-2: Corrective Action Plan – Central Workshop

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
1.	Occupational Health and Safety	1. Unsafe practices related to hot works, electrical safety, fire and life safety, hazardous chemical, lifting tools and tackles and machine guarding		1. Hot Work a. Plasma cutting area to be secluded with access control. b. Gas cutting sets should be provided with flashback arrestors at torch and cylinder-end. c. Pressure gauges on acetylene and oxygen gas cylinders should be in working condition. d. PPEs such as welding glasses should be provided for assistant/helpers.	Walker Sons – Facility management	Corrective actions to be implemented on immediate basis and completed within a timeframe of 6 weeks from the date of initiation.	USD 10,000

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				e. Welding machines should have dedicated grounding connections connected properly to earth cables. Welding machines lugs should be industrial and should be in god condition at all times. Frayed lugs and cables shall be replaced immediately. f. All gas cylinders in-use should be stored in horizontal position. 2. Electrical Safety a. Provide dedicated earthing pits for heavy machinery/equipment and distribution board with high voltage. Earth pits to have unique identification numbers and to be tested annually for its resistance and continuity. Physical traceability of the earth connections to be ensured for all earth pits. b. Hazard communication labels should be provided to distribution boards and should be non-combustible in			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				nature c. RCCBs to be provided to all equipment/machineries which require manual intervention while being energized. Electrical Fuses to be replaced with MCCBs or circuit breakers. d. Provide rubber mats to distribution boards for workers working on the distribution boards. e. Electrical cables to be provided with industrial plug tops and all frayed insulation to be replaced with industrial insulation 3. Fire and Life Safety a. Provide adequate numbers of fire extinguishers. b. Firefighters to be identified from the workforce and trained for firefighting 4. Hazardous Chemical a. Develop a policy on 'Asbestos Free Works'. Develop a procedure on ACM handling and disposal. Inventorise ACM at workplace and treat it as hazardous			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				material. Any broken or damaged ACM to be disposed to authorised hazardous waste handler. b. Diesel storage area to be provided with secondary containment. The area should be well lit and have adequate ventilation. 5. Lifting Tools and Tackles a. Undertake Safe Load Tests for all lifting tools and tackles including, slings, chains and lifting ropes. All lifting tools and tackles to be provided with UIN/UIDs. b. Procedure for discarding unsafe/damaged slings/ropes/chains to be developed and implemented. Tagging of safe equipment to be used shall be undertaken. 6. Machine Guarding a. The moving and rotating parts of all the machines should be identified and provided with machine guarding to prevent accidental injuries to workers.			

S. No.	Aspect	Summary of Issues	Priority	Proposed Corrective Action	Responsibility	Timeline	Budget Estimate
				7. Incident Reporting a. An incident reporting and recording system should be developed at the facility. All incidents and near misses should be recorded and investigated. Corrective actions should be taken to prevent recurrence of injuries. A Safety Supervisor should be designated at the facility to look into the health and safety aspects.			
2.	Grievance Redressal	1. No formalised grievance mechanism has been developed by Walker Sons at the site level.		1. Grievance Redressal Mechanism should be adequately and elaborately developed for the workers relating to the steps to follow in terms of redressal of grievances, time taken, anonymous grievance handling etc. 2. Grievance Box/ register should be maintained on site for the workers with Grievance Officer's contact details visible to all at site. It should be ensured that the Grievance Officer's contact details shall be communicated to all workers during the induction period.	Walker Sons – HR Team	GRM to be developed on immediate basis and implemented within 2 weeks of development	Within existing budget and resources

Appendix I: List of documents reviewed

Appendix I: List of documents reviewed

The following are the list of documents reviewed as part of assessment:

Name of the document	Date and validity of the document (if applicable)
Contract for design and operation service of a shiplift and transfer system between Walkers Colombo Shipyard (Pvt.) Ltd. and Shiplift Jade GmbH (Contract No.: SLJ150120-STS-WC01)	17th December 2015
Contract for supply and installation of a shiplift and transfer system between Walkers Colombo Shipyard (Pvt.) Ltd. and Ra In Ho Co., Ltd. (Contract No.: 201510-STS-WC01)	17th December 2015
Lease agreement No. 20 between Ceylon Fisheries Harbours Corporation and Sea Gulf UK (Private) Ltd.	14th November 2014
Lease agreement No. 509 between Ceylon Fisheries Harbours Corporation and Sea Gulf UK (Private) Ltd.	30th October 2014
Supplementary Lease agreement no. 54 between Ceylon Fisheries Harbours Corporation and Sea Gulf UK (Private) Ltd.	10th June 2015
Certificate of Incorporation of Walkers CML Marine (Private) Limited	29th July 2015
Certificate of Incorporation of Walkers Colombo Shipyard (Private) Limited	30th September 2015
EMS Implementation checklist	--
List of IMS Procedures	--
Quality, Environmental & Occupational Health & Safety Integrated Management Systems (I.M.S) Manual – Level I documents	--
WCS Proposed Organization structure	23rd August 2016
Colombo Yard Layout	15th April 2015
Monthly management accounts for WCS for FY 16	15th July 2016
WCS Customer Acquisition process	26th July 2016
WCS Direct staff details	26th July 2016
Agreement with Indian Register of Shipping for building of new ships as per the standards of IRCLASS	9th February 2016

Name of the document	Date and validity of the document (if applicable)
WCS Compliance register for legal and other requirements	01st May 2016
Contract for the unit construction and assembling work for new steel barge Yard No. NB/001 between Walkers Colombo Shipyard (Private) Limited and Dolphin Marine Lanka (Pvt.) Ltd. Contract No. WCS/NB/001	10th February 2016
Electrical maintenance services agreement between Walkers Colombo Shipyard (Private) Limited and RTD Marine Services and Engineers (Pvt.) Ltd. Contract No. WCS/YD/GEN/028	14th June 2016
Walkers Colombo Shipyard (Private) Limited – General Terms and Conditions for Ship Repair Work	--
Hazard assessment checklist	--
Sample Incident Report (Doc. No. WCS/FS/005)	04th July 2016
Yard equipment list as of July 2016	--
List of fire prevention equipment	--
WCS Procedure for Emergency Preparedness and Response (EHS/4.7.1/PR/1) – Level II Document	08th February 2016
WCS Procedure for Environmental Monitoring and Measurement – Level II Document	10th February 2016
Sample Minutes of Meeting for tool box talks	21st July 2016
Application for a Permit to Engage in a Development Activity submitted by WCS to Coast Conservation Department	16th May 2016
Draft Lease agreement between State Engineering Corporation of Sri Lanka and Walkers Colombo Shipyard (Pvt) Ltd	--
List of machines and equipment at Central Workshop	--
Letter from General Manager of Ceylon Fisheries Harbour Corporation (CFHC) to The Master of CFHC Dredger 'Sayuri' to dredge 35 loads of 300 cu.mts. at Mutwal Fisheries Harbour	10th June 2016
List of equipment in the WSC shipyard	18th August 2016
General layout of proposed shiplift showing fire line and fire points	5th August 2016
Final implementation schedule for shiplift and ship transfer system at Mutwal harbour	--

Name of the document	Date and validity of the document (if applicable)
Welder Performance Qualification (WPQ) submitted by Indo East Engineering & Construction (Lanka) Pte. Ltd.	03rd April 2009
Quotation from Sagara Fabricators & Marine Engineers (Private) Limited	13th February 2016
Quotation from Active Marine Service including employee list, certificate of registration, EPF license,	25th May 2016
Central Workshop employee salary details for June 2016	--
Quotation from J&D Marine Holdings Private Limited including certificate of incorporation	30th December 2015

Appendix II: Photo Log

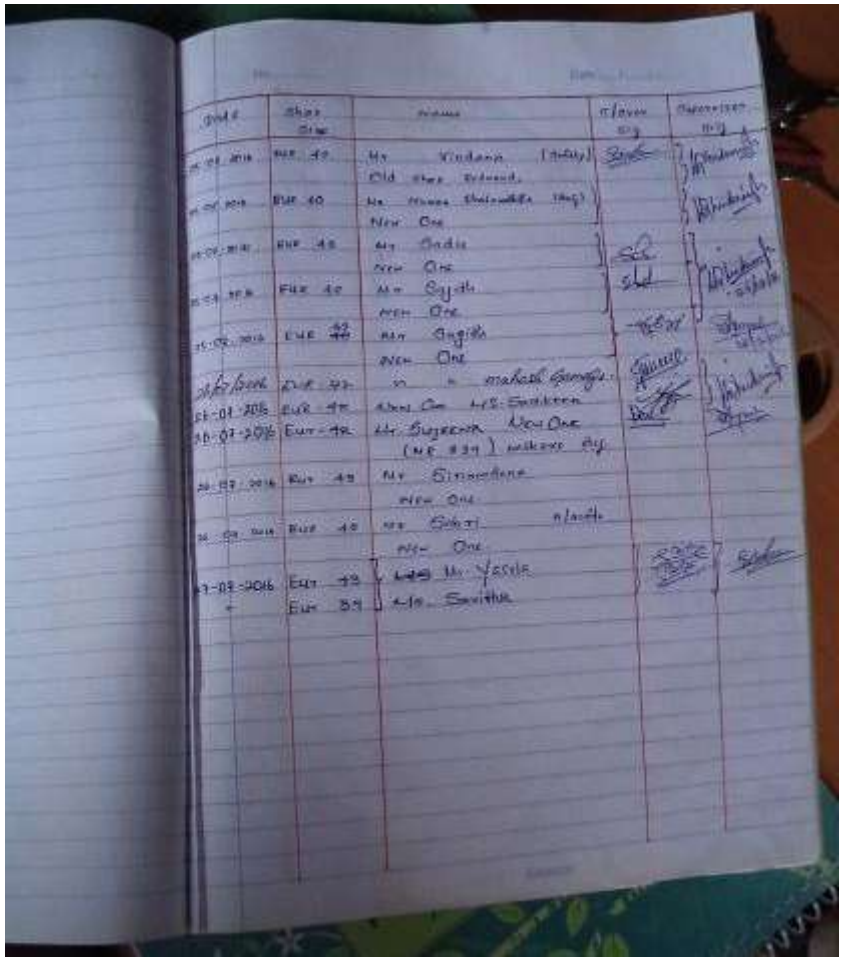
Ref #: WCS / 01	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Dredging works being carried out by CFHC dredger Sayuru*

Ref #: WCS / 02	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Piling works being undertaken at the project site on the day of visit*

Ref #: WCS / 03	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Construction of 7 tons bollard work boat*

Ref #: WCS / 04	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Construction of 40 m deck barge at site.*

Ref #: WCS / 05	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Storage of oxygen and acetylene cylinders at site in upright position with restricted access and warning signage.*



Ref #: WCS / 06 **Date:** 27th July 2016	**Location:** Colombo shipyard Project site	**Description of observation:** *PPE issue register maintained by one of the contractors engaged at site.*

Ref #: WCS / 07	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Container at site used for storage of acetone and thinner, provided with one frame axial exhaust fan without intrinsically safe fitting.*

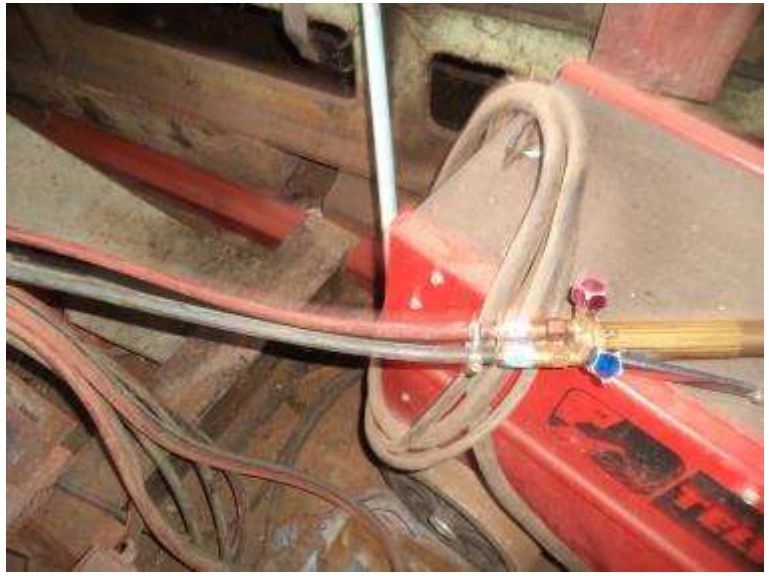
Ref #: WCS / 08	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Plastic buckets being used for collection of mixed waste – both general refuse and hazardous waste.*

Ref #: WCS / 09	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Consultation with contract workers*

Ref #: WCS / 10	**Location:**	**Description of observation:**
Date: 27th July 2016	Colombo shipyard Project site	*Pressure gauges provided to the acetylene and oxygen gas cylinders were noted broken/damaged.*

Ref #: WCS / 11	**Location:**	**Description of observation:**
Date: 30th July 2016	Central Workshop	*Lifting tools and tackles being used at the Central Workshop were not tested for safe loads.*

Ref #: WCS / 12	**Location:**	**Description of observation:**
Date: 30th July 2016	Central Workshop	*Electrical panels were only provided with Miniature Circuit Breakers (MCBs) or Moulded Case Circuit Breaker (MCCBs) or electric fuses for over current protection; RCCB not provided.*



Ref #: WCS / 13	**Location:**	**Description of observation:**
Date: 30th July 2016	Central Workshop	*The gas cutting sets were observed provided with flashback arrestors (non-return valve) at the torch end whereas the cylinder end was not provided with flashback arrestor. Pressure gauges provided to the gas cylinders were noted broken/damaged.*

Ref #: WCS / 14	**Location:**	**Description of observation:**
Date: 30th July 2016	Central Workshop	*Corrugated asbestos cement sheet at Central Workshop was noted.*