

EXECUTIVE SUMMARY

M/S. CHENNAI PORT TRUST

(Development/Improvement of 7 Infrastructure
Facilities)

At



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PREPARED BY

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1.0 INTRODUCTION

1.1 *Back Ground*

Chennai Port is one among the twelve major ports in the country and 2nd largest Port in terms of cargo handled. This gateway port for all cargo has completed 130 years of glorious service to the nation's maritime trade. Chennai Port is located at latitude of 13° 06' N and longitude of 80° 18' E on the southeast coast of India and in the northeast corner of Tamil Nadu. The Port serves the geographical regions of Tamil Nadu, Pondicherry, South Andhra Pradesh and parts of Karnataka and has now emerged as hub on the east coast of India. Major commodities being handled at the Port are Containers, Automobiles Exports, POL and general cargo items. Though it is about 600 nautical miles away from the international maritime route, because of its location, proximity to market, competitive pricing, safe and secure operations this is one of the preferred ports for the trade.

The total quay length available is around 5.5 km. It has all 24 berths spread over in 3 docks i.e. Ambedkar Dock, Jawahar Dock and Bharathi Dock. The depth is varying from 8.5m to 16.5m. There is 7.0 km of entrance channel with the depth of outer channel being 19.2 m and that of the inner channel being 18.6 m. The Port has a total land area of 240 ha (approx.).

Chennai Port Trust has already prepared Business Plan (Master plan) and development/ improvement of Infrastructure facilities are undertaken as and when the need arises with the prior Environmental Clearance for specific projects. Based on the Business Plan of Chennai Port a perspective plan for the Port has finalized up to 2020. Considering the MoEF circular No. 19-140/2014/4-IA.III dt. 07-10-14, Chennai Port proposes to process for One-time Environmental Clearance for the development/ improvement of infrastructure facilities as per the proposals finalized up to 2020 including relocation of sand trap.

M/s. Chennai Port Trust has appointed SV Enviro Labs & Consultants, Visakhapatnam for preparation of EIA Report for proposed project Development/Improvement of 7

Infrastructure Facilities at Chennai Port in order to seek Environmental Clearance. SV Enviro Labs & Consultants is a QCI-NABET accredited EIA consultancy organization for “Ports, Harbours”. Obtained ToR Vide F.No: 10-127/2007-IA.III Dt: 05.02.2016.

1.2 Structure of EIA Report

The Environmental Impact Assessment Documentation has been prepared in terms of EIA notification of the MoEF dated 14-9-2006, as amended on 1st Dec 2009, 4th April 2011 for seeking Environmental Clearance for M/s Chennai Port Trust, Development/Improvement of 7 Infrastructure Facilities at Chennai Port at Rajaji Salai, Chennai, Tamil Nadu falling under Category –A.

1.3 Project Proposal

Chennai Port Trust proposes for Development/Improvement of 7 Infrastructure Facilities at Chennai Port at Rajaji Salai, Chennai, Tamil Nadu. The following proposals planned for development/Improvement of Infrastructure Facilities:

- (i) Improvement to the existing Jawahar Dock (East) Berths for handling bulk cargoes;
- (ii) Improvement to the existing Bharthi Dock II Berth for handling bulk cargoes;
- (iii) Relocation of existing Sand Trap and Capital Dredging;
- (iv) Development of Multi level Car parking facility;
- (v) Development of Coastal Terminal at northern sheltering arm at east of Bharathi Dock turning circle;
- (vi) Development of Dry Dock Facility in the Boat Basin / Timber Pond area; and
- (vii) Development of Storage Sheds and Tank Farms as per the Land Use Plan of the Chennai Port.

1.4 Project Location

The proposed project is located at Rajaji Salai, Chennai, Tamil Nadu State. The proposed project is spread over an area of 240ha of land. Geographically, the port is at latitude 13°

04°53' N; longitude 80° 17' 42' E; at an altitude of about 2m above mean sea level. Chennai Central Railway Station around 2.0 KMs from the proposed project.

2.0 EXECUTIVE SUMMARY

The Executive Summary covers the following chapters in brief:

1. Project Description
2. Description of Environment & Identification of Impacts and Mitigation Measures
3. Significance & Project Benefits
4. Environmental Management Plan

2.1 *Project Description*

Goal and Objectives:

The proposed projects are the development/ improvement of infrastructure facilities needed for export / import of goods which are essential for economic development of the region.

Proposed Facilities

The established infrastructure facility of Port is having the designed capacity of 93.44 Million Tonnes (as on Mar. 2016). However, Port has handled 50.214 MT during 2016-17.

The present proposal will only boost the capacity of the Port by 1 MTPA since most of the projects are due to replacement of cargo presently handled by the Port and upgradation of the existing structure.

The following proposals planned for development/Improvement of Infrastructure Facilities:

- (i) **Improvement to the existing Jawahar Dock (East) Berths for handling bulk cargoes;**

The total quay length in JD is about 1.3 km with 6 berths, 3 each on the east and the west and basin dimensions of 655m x 152m. The existing depth in the dock is about 12m. JD East (JD II, IV & VI) berth facilities were

mechanized and developed considering the handling of coal. Subsequently, handling of coal has been discontinued. Since then, the berths are used for edible oil, molasses, lime stone, rock phosphate, sulphur, other ores, phosphoric acid, barites, granite, scrap, mill scales, logs & timber and general cargo.

The existing JD berth composes monolith wall of 518 m and balance 137 m with diaphragm wall and pile structure. The proposal envisages improvement to the existing berths in the form of strengthening of berth structure for about 140 m out of 655 m long and re-paving the yard on eastern side of the JD berths.

The proposal is now for change in the cargo handling and no deepening or any other activity that will lead to impact.

ii) Improvement to the existing Bharthi Dock II Berth for handling bulk cargoes

Bharathi Dock II was commissioned in the year 1977 with facilities for handling 8 MTPA of iron ore. Bharathi Dock has two POL berths (BD I & III) for handling crude and petroleum products up to 12 MTPA & four berth of 885 m length to handle containers up to 0.8 MTEUs.

Previously the berth BD II is used for handling iron ore through the conveyor system. The machinery has to be removed and the dock will be used for handling bulk cargoes. The jetty is 400 m in length.

The proposal envisages improvement to the existing berths in the form of re-paving the berth surface, replacement of fenders, strengthening works to the steel piles, yard pavement and dismantling of ext. conveyor lines/ drive house/ stacker cum reclaimer. The impact will reduce as the iron ore is a dusty cargo and at present the proposal is of handling other bulk cargoes.

iii) Relocation of existing Sand Trap and Capital Dredging;

Chennai port is an artificial harbor with 7km long approach channel for safe navigation of vessels calling at port. It is protected on eastern side by 1005

m long outer arm breakwater constructed in 1984. Due to the bed slope of the coast the channel is falling within the littoral drift zone. The effect of littoral drift is immense on the shoreline of Harbor and it experiences severe erosion during the SW & NE monsoon periods. To overcome this 100 M x 1000M sand trap was constructed at eastern side of eastern breakwater. To prevent closure of river Cooum mouth state government has constructed revetment / training wall at southern end of the port.

These are causing heavy sedimentation in the existing sand trap and increasing the recurring expenditure on maintenance on dredging cost. In this connection CWPRS (Central Water & Power Research Station), Pune has studies on siltation in channel and suggested for new sand trap. This will help in minimizing the recurring expenditure on maintaining the channel and for safe navigation of vessels visiting the port.

iv) Development of Multi level Car parking facility

At present the car handling operations are carried out at the port in 47,700 sq.metre of open space. The basic objective behind developing the multilevel car parking is to use this space for other cargo handling related activities and further to increase the efficiency in car handling operation. Presently, six to seven Ro-Ro vessels visit the Port in a month. To ensure that the terminal is optimally utilized, the port is planning to use the terminal for other cargos other than dirty / bulk cargo.

The proposed berth designed for 300 m length and 30 m width based on the requirement to accommodate 225 m to 275 m length of car carrier/ cargo vessels. The entire substructure has been considered as a system of bored cast in situ concrete piles. The superstructure will be made up of combination of pre-cast and cast-in-situ concrete decking. The car carrier / cargo vessels need a minimum draft of -12.0 m CD. The present available depth at the proposed berth area is varying from -1.0 m to -12.0 m. The total

area to be dredged is estimated 35,600 sqm and the dredging quantity is about 2,00,000 m³.

Chennai Port has already obtained Environmental Clearance from MoEF for the Construction of Additional Berth (Ro-Ro) vide letter no. 10-83/2007-IA-III dtd. 16.01.2008 and got validity extension up to 16.01.2018 vide letter no. 10-83/2007-IA- III dtd. 08.03.2013.

The proposal envisages in development of Multilevel Car Park facility adjacent to the berth on land and partially falls on water front is planned for a total area of 10,290 Sq.mt. to accommodate 5000 cars. The number of floors planned is Ground + 5 floors.

v) **Development of Coastal Terminal at northern sheltering arm at east of Bharathi Dock turning circle:**

To accelerate the economical mode of transportation towards development of dedicated Coastal Terminal, Ministry of Shipping, GoI has instructed all major ports for development of exclusive Coastal Terminals for handling dry bulk/ general cargo. In this connection Chennai Port propose to develop exclusive Coastal Terminal with open type piled wharf structure of 260m x 16m to 19.5m in front of the Northern Sheltering arm of breakwater at south east corner of Bharathi Dock turning Basin. The alongside of the Coastal Terminal and the adjacent areas of the Turning Basin could be dredged to (-)9.00m CD to accommodate Coastal Shipping vessels having drafts up to 8.0m.

The development of backup area to a width of 30m by providing base course and concrete finish, Concrete approach road of 9.0m width from eastern revetment to southern end of the proposed Terminal, development of additional stocking area over the reclaimed area for about 52000 sqm and necessary rectification works to the existing block wall are proposed.

vi) **Development of Dry Dock Facility in the Boat Basin / Timber Pond area**

The Boat basin/ Timber pond is a shallow basin with drafts varying from -1 m to -6 m CD. It serves as a shelter for port crafts mainly tugs, launches etc. and

for port craft that require repair and maintenance. It also houses a slipway for under water repair of port crafts. The timber pond is an extension of boat basin with water spread having even shallower draft.

The proposed facility is conversion of existing Boat basin and Timber Pond located in the south west end of inner harbor to facilitate the repairing of ships.

vii) Development of Storage Sheds and Tank Farms as per the Land Use Plan of the Chennai Port

Ministry of Shipping has finalized the ‘Policy Guidelines for land management by Major Ports, 2014’. The said guidelines have been approved by the Union Cabinet on 02.01.2014. The main objectives of the Policy is to ensure that land resources are put to optimum use as per the approved Land Use Plan with focus on retaining /attracting port traffic.

Accordingly, Port has finalized the Land Use Plan and proposed to allot land to the users on tender basis. As part of the Land Use Plan, Port has identified the Land for Development of Covered Sheds, Tank Farms etc. The facilities will be developed either through internal recourses or through third party.

2.2 Description of Environment & Identification of Anticipated Impacts

Description of baseline environmental status and the impact on the existing environment after construction and operation of the proposed project have been detailed with respect to the following components of the environment. The existing status of important environmental components and impact of project activities on them is summarized below.

Land Environment:

The following prominent land use classes & pattern have been observed:

Type of Land	Area (ha)	Area (%)
Water Body	17027	54.18

Settlement/Built up area	6124	19.49
Agriculture Land	285	0.91
Vegetation	724	2.30
Marshy Land	2252	7.17
Barren Land	5016	15.96
Total	31429	100.0

There is minor quantity of solid and hazardous waste generation due to the proposed project and will be handled scientifically due to this there may not be any adverse impact on land is envisaged. Thus, there will be no change in the soil characteristics, land use pattern and landscape due to the construction & operation of the proposed facilities.

To characterize the nature of soil, samples from four locations in different directions within the study area were collected and characterized.

The pH of the soil is an important property; vegetation cannot grow in low and high pH value soils. The normal range of pH in the soils is 6.0 to 8.5. These soils are called as normal to saline soils. Most of the essential nutrients like N, P, K, Cl and SO₄ are available for plants at the neutral pH except for Fe, Mn and Al (not mentioned in the table) which are available at low pH range. The soils having pH below 7 are considered to be acidic from the practical standpoint, those with pH less than 5.5 and which respond to liming may be considered to qualify to be designated as acid soils. On the basis of pH measurements, the degree of soil acidity may be indicated. The pH values in the study area are varying from 7.10 to 8.12 indicating that the soils are moderately alkaline in nature.

Air Environment:

Existing Ambient Air Quality

The ambient air quality monitoring stations were selected after a brief study based on the following considerations

- Meteorological conditions on synoptic scale
- Topography of the study area
- Predominant wind direction

- Emission sources
- Receptors sensitivity

To evaluate the baseline ambient air quality status, one season data was generated at ten locations in and around the port including residential & rural area for a period of three months from March' 2016 to May' 2016. During the monitoring period the concentration of air pollutants namely PM₁₀, PM_{2.5}, SO₂, NO_x, CO in ambient were measured.

The highlights of the results are as below:

Summary of Analysis of Ambient Air Quality in the Study Area

Parameter	PM10($\mu\text{g}/\text{m}^3$)					PM2.5($\mu\text{g}/\text{m}^3$)					SO2($\mu\text{g}/\text{m}^3$)					NOx($\mu\text{g}/\text{m}^3$)				
	No.of samples	Maximum	Minimum	Mean	98 th percentile	No.of samples	Maximum	Minimum	Mean	98 th percentile	No.of samples	Maximum	Minimum	Mean	98 th percentile	No.of samples	Maximum	Minimum	Mean	98 th percentile
A1	26	76.7	57.5	65.4	73.7	26	38.9	29.2	33.2	37.4	26	11.8	8.8	10.0	11.3	26	20.7	15.5	17.6	19.9
A2	26	82.9	70.9	76.2	82.5	26	36.5	31.2	33.6	36.3	26	12.7	10.9	11.7	12.7	26	20.3	17.4	18.7	20.2
A3	26	86.6	74.6	79.9	86.2	26	41.4	35.7	38.2	41.2	26	13.3	11.5	12.3	13.3	26	23.2	19.9	21.4	23.0
A4	26	87.8	75.8	81.1	87.4	26	42.6	36.8	39.4	42.4	26	13.5	11.7	12.5	13.4	26	19.4	16.7	17.9	19.3
A5	26	93.6	81.6	86.9	93.2	26	45.2	39.4	42.0	45.0	26	14.4	12.6	13.4	14.4	26	24.8	21.6	23.1	24.7
A6	26	73.2	52.9	64.0	73.1	26	35.4	25.6	30.9	35.3	26	11.3	8.1	9.9	11.2	26	19.6	14.2	17.2	19.6
A7	26	78.0	63.0	68.9	77.9	26	38.4	31.0	33.9	38.4	26	12.0	9.7	10.6	12.0	26	21.1	17.1	18.7	21.0
A8	26	74.1	49.4	59.6	71.1	26	34.8	23.2	28.0	33.4	26	11.4	7.6	9.2	10.9	26	20.1	13.4	16.2	19.3
A9	26	70.2	45.6	56.7	67.2	26	33.0	21.4	26.6	31.5	26	10.8	7.0	8.7	10.3	26	19.1	12.4	15.4	18.3
A10	26	66.2	41.6	54.2	64.3	26	31.1	19.5	25.4	30.2	26	10.2	6.4	8.3	9.9	26	18.0	11.3	14.7	17.5
NAAQS	100($\mu\text{g}/\text{m}^3$)					60($\mu\text{g}/\text{m}^3$)					80($\mu\text{g}/\text{m}^3$)					80($\mu\text{g}/\text{m}^3$)				

Note : 1. Carbon Monoxide, Hydrocarbons as Methane (mg/m^3) and Non Methane Hydrocarbons(mg/m^3) were monitored & analyzed at all locations and were found BDL

From the monitoring results, it may be concluded that the concentration of the air pollutants, as stated above, are well within the limits specified under NAAQS for industrial, rural and residential areas.

Noise Environment

Noise monitoring was conducted at 10 locations within the study area, representing industrial, rural and residential areas. Maximum Lday and Lnight was observed to be 74.4 and 62.9 at N5. The minimum Lday and Lnight was found to be 49.5 dB(A) and 37.8 dB(A) measured at N10. All the results observed were within the specified CPCB Standards.

All the results observed were within the specified CPCB Standards. The variation in the noise level may be attributed to the movement of vehicles on the surrounding local roads adjacent to the port. A little increase in the noise level during construction phase has been envisaged.

The duration of construction activities shall be restricted 8 to 12 hours only with maximum incremental noise level equivalent to 10 dB(A) which will correspond to 3 to 4 dB(A) during day and night. There will be no additional noise generation during operation phase. Hence, impact on the noise quality shall be practically insignificant due to proposed project activities.

Water Environment:

To evaluate the existing water quality, 05nos of ground water samples and 05nos of marine water samples were collected from different locations around the port and characterized for relevant parameters.

Marine water quality results are summarized below:

- pH of the surface water collected was neutral with pH ranging from 7.56 – 8.0
- TDS was found to be 31026 - 34642 mg/l.
- Total hardness was found to be 6250 – 6720 mg/l.
- DO was observed as 5.8 – 5.9 mg/l.
- Total coliform in water was 45 - 96 MPN/100ml.

- All the heavy metals were found to be within below detectable limits.
- Total coliform in water was 180 - 650 MPN/100ml. The likely source of bacteriological contamination was due to the proximity to residential area
- All the heavy metals were found to be within below detectable limits.

Summary of Groundwater quality:

- The pH limit fixed for drinking water samples as per IS:10500 is 6.5 to 8.5 beyond this range the water will affect the mucus membrane and or water supply system. During the study period, the pH of the groundwater was found varying between 7.91 and 7.97. The pH values for all the samples collected in the study area during study period were found to be within the desirable limits.
- The desirable limit for total dissolved solids as per IS:10500 is 500 milligrams per litre (mg/l) where as the permissible limits in absence of alternate source is 2000 mg/l, beyond this palatability decreases and may cause gastro-intestinal irritation. In groundwater samples collected from the study area, the total dissolved solids (TDS) were found to be varying between 681 mg/l and 2085 mg/l.
- The desirable limit for Chloride is 250 mg/l as per IS:10500 where as the permissible limit of the same is 1,000 mg/l beyond this limit taste, corrosion and palatability are affected. The Chloride levels in the groundwater samples collected in the study area were ranging from 144 - 872 mg/l.
- The desirable limit as per IS:10500 for hardness is 300 mg/l where as the permissible limit for the same is 600 mg/l. Beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the groundwater samples collected from the study area, the hardness was found to be varying from 232 mg/l to 752 mg/l.
- Fluoride is the other important parameter, which has the desirable limit of 1 mg/l and permissible limit of 1.5 mg/l. However, the optimum content of fluoride in the drinking water is 0.6 to 1.5 mg/l. If the fluoride content is less than 0.6 mg/l it causes dental caries. If it is above 1.5 mg/l it causes staining of tooth enamel, higher concentration in range of 3-10 mg/l causes fluorosis. In the groundwater samples of study area the fluoride values were found to be within a range of 0.41 mg/l to 0.79 mg/l.

All the heavy metals in all samples were found to be below the permissible limits.

Water Consumption:

Port is drawing water from CMWSSB for the operations of Port. As of now, Port is having surplus of water due to ban in handling dusty cargoes viz., Coal and Iron Ore.

The requirement of water is as follows:

S.No	Description of Activity	Quantity (KLD)
1	Improvement to the existing Jawahar Dock (East) Berths for handling bulk cargoes	30.0
2	Improvement to the existing Bharathi Dock II berth for handling bulk cargoes	24.0
3	Relocation of existing Sand trap and Capital Dredging	Nil
4	Development of Multi level car parking facility	1.865
5	Development of Coastal Terminal at northern sheltering arm at east of Bharathi Dock turning circle	12.5
6	Development of Dry Dock facility in the Boat Basin/Timber Pond area	2.5
	Total	70.865

As the improvement proposals are planned in varying time scale, the average water requirement is 11.81KLD. This will be managed from the water supply at present provided by the CMWSSB. During operation phase there will additional water requirement for 3.0 KLD only.

Biological Environment:

The proposed facilities shall be installed within the premises of Chennai Port Trust. There is no additional point and non-point source of emission or discharge of pollutants except

DG and fire pumps hence, no adverse impact on the biological environment is envisaged due to the proposed project activities and operation.

Socio-Economic Environment:

This project would bring positive impacts on the socio-economic front. No R& R.

During the operation phase, CPT will provide significant opportunities for employment in skilled, semi skilled & unskilled categories. This would multiply economic opportunities, and henceforth enhance the livelihood patterns of this region. Amenities like fresh water for port complex, transportation facility, green belt etc would positively enhance the infrastructure. Maximum of the human resource requirement will be met by local employment. Thus the proposed project would considerably beneficial to the socioeconomic conditions of local area.

2.3 *Analysis of Alternative (Technology & Site)*

During various stages of the development of the proposed projects there will be generation of direct and indirect employment in the auxiliary and other industries which will benefit to State and National Economy. The aforementioned 7nos infrastructure development projects are proposed to be carried out within existing Chennai port premises only and hence, no other new alternative site is required.

2.4 *Environmental Monitoring Programme*

A monitoring schedule with respect to Ambient Air Quality, Waste water quality, Noise Quality prepared as per SPCB/CPCB/MoEF & CC guidelines.

2.5 *Additional Studies*

Based on standard ToR and EIA report is prepared. Salient features of the studies are as under:

Impact on local infrastructure such as road network etc

Transport requirements will arise during the construction phase due to the movement of both the personnel and materials. The proposed site is well connected to the roads.

Proposed plan to handle the socio-economic influence on local community:

The proposed project will generate direct/indirect employment during the Construction/Operation Phases. For unskilled and skilled suitable jobs, it would be ensured that only local workers will be engaged for carrying out construction jobs. This would impart positive impact on the socio-economic condition of the local area. For skilled jobs, only marginal number of workers is likely to be engaged. In view of the size of population residing within 5 km radius, no additional study is required to assess the impact of marginal number of workers coming from outside area.

2.6 Risk Analysis

Risk Assessment and Disaster Management Plan for the proposed project has also been carried out and necessary safeguard measures have been discussed in EIA Report.

2.7 Significance & Project Benefits of the Project

This project proposed for Development/Improvement of Infrastructure facilities in an area of 240Ha of Chennai Port.

Project Benefits:

- Improvement in the physical infrastructure
- Improvement in the social Infrastructure
- Employment and other benefits
- Financial Benefits of the projects

2.8 Environmental Management Plan

Environmental Management Plan (EMP) is planning and implementation of various pollution abatement measures for any proposed project. The EMP lists out all these measures for planning phase, construction phase and operational phase of the port.

Development/improvement of port infrastructure facilities shall be designed taking into account all the legislations/rules and as per the directives of Environmental clearance documents.

The control of Environmental pollution during construction phase even though for a shorter period is of vital importance. The required mitigation measures with complete details have been considered in order to develop effective mitigation measures.

The Environmental Management Plan during the operational phase of the port shall therefore be directed towards the following:

- Air Emissions Management
- Control of Noise
- Waste water management
- Waste Management
- Dredged materials management
- Hazardous material and oil management
- Biodiversity management
- Green belt development
- Energy conservation measures
- Environment Management Cell

Project Cost:

The total cost of the project – Rs. 905.59 Crores and time of completion is 12 months after obtaining Environmental Clearance