RESTRICTED DOCUMENT Ref No.AU/IRS/MS/215-2022 DT 04.11.2022

Preparation of Local Level Coastal Regulation Zone Map for the Proposed Green Field Vadhavan Port at Vadhavan Village, Dahanu Taluka, Palghar District, Maharashtra State by Superimposing on Approved CZMP as per CRZ Notification 2019

For
JAWAHARLAL NEHRU PORT TRUST
NAVI MUMBAI – 400 707
MAHARASHTRA

INSTITUTE OF REMOTE SENSING
ANNA UNIVERSITY, CHENNAI-25

October 2023

CONTENTS

Executive Summary

On the request of Jawaharlal Nehru Port Trust, Navi Mumbai – 400 707, Maharashtra a study was carried out to prepare local level CRZ map for 7Km radius at 1:4,000 scale for the proposed Green Field Vadhavan Port in and around Vadhavan village in Dahanu taluka, Palghar district, Maharashtra state by superimposing on approved CZMP as per CRZ notification, 2019. The satellite imagery of the project area was interpreted for topographic and geomorphic features in the vicinity of the project site. The project site falls in the vicinity of Arabian Sea and Mangroves

The HTL and LTL along with setback lines as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 were superimposed on to georeferenced cadastral maps to prepare a local level CRZ maps at 1:4,000 scale. The location of proposed Green Field Vadhavan Port in and around Vadhavan village in Dahanu taluka, Palghar district, Maharashtra state as provided by the client has also been superimposed on the CRZ map. The co-ordinates of the HTL derived from approved CZMP at 1:25,000 scale in WGS84 system are presented in the Annexure-I and local level in CRZ maps 1:4,000 scale with the location of project site as per approved CZMP vide CRZ notification 2019 are furnished along with this report.

The proposed details viz Approach Trestle, Breakwater, Navigational Area, Offshore Reclamation Area, Sheltered Area within Vadhavan Port Limits lies in CRZ-IVA and Reclamation Area near Shore lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC

The reclamation area near shore in within Vadhavan Port Limits lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA, and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC

The remaining Area within Vadhavan Port Limits lies in CRZ-IA, CRZ-IA (50m Mangrove Buffer Zone), CRZ-IB, CRZ-III (No Development Zone), and CRZ-IVA areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC

The proposed Road and Rail Alignment for the port connectivity lies in CRZ-IB, CRZ-III (200m to 500m from HTL), CRZ-III (No Development Zone) and Outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC. The detailed CRZ status is depicted in Table.2. (Refer local level CRZ map)

The co-ordinates of the HTL points derived from approved CZMP at 1:25,000 scale in WGS84 system are presented in the **Annexure-I**.The satellite imagery of the project site superimposed is given in **Annexure - II**. The map howing the project site superimposed on approved CZMP as per CRZ notification 2019 of Maharashtra is shown in **Annexure – III**. The map showing the CRZ status at 1:4000 scale for 7Km radius around the project site is attached in **Annexure – IV**. Various coastal regulation zones in which the project site falls are presented in the conclusion section of this report.

PROJECT DATA SHEET

Title: Peparation of Local Level Coastal Regulation Zone Map for the Proposed Green Field Vadhavan Port at Vadhavan Village, Dahanu Taluka, Palghar District, Maharashtra State by Superimposing on Approved CZMP as per CRZ Notification 2019

Project Ref No.	: Ref No.AU/IRS/MS/215-2022 DT 04.11.2022
Principal Consultant	: Dr. M. Shanmugam, Associate Professor
Co-Consultant	: Dr. D.Thirumalaivasan, Professor & Director
Done for	: Jawaharlal Nehru Port Trust, Navi Mumbai – 400 707. Maharashtra
Survey Team	: Mr.S.Sathishkumar, IRS, AU Mr.P. Sukumar, IRS, AU
Data Processing	: Mr. J. Prem Kumar, IRS,AU Mr. V. Chinnaanandh, IRS, AU
Report Preparation	: Dr. M. Shanmugam, Associate Professor
Quality Assessment Team	: Dr. K.Srinivasa Raju Professor, Dr.C.Udhayakumar, Professor Dr.R. Kanmani Shanmuga Priya, Assistant Professor

The Quality Assessment Committee for consultancy projects has scrutinized the local level CRZ map and corresponding text report of the above project on **13.10.2023.**The principal consultant of the project has presented the approach adopted, findings of the study to the committee. The committee has evaluated the CRZ Map and the report for different parameters against the standards prescribed for the mapping. The positional accuracy, attribute accuracy, completeness, semantic accuracy of the output were assessed and found satisfactory. The committee recommends the approval of the map and associated report.\

Dr.M. Shanmugam
(Principal Consultant)

Dr. K.Srinivasa Raju
(QA member)

Dr.C.Udhayakumar
(QA member)

Dr.R. Kanmani Shanmuga Priya
(QA member)

DIRECTOR

Director
Institute of Remote Sensing
Anna University,
Chennai - 600 025.

List of Figures

List of Tables

1.0 INTRODUCTION

1.1 Coastal Regulation Zone

The coastal zone is the area of interaction between land and sea. The coastal Zone of Maharashtra has a very high concentration of population along with ecologically sensitive areas like mangroves. There is a spurt of developmental activities arising from huge residential colonies, new industries and tourism centres along the coast and in coastal zone. There is a need to protect the coastal environment while ensuring continuing production and development. This zone is extremely vulnerable and has to be managed judiciously striking a balance between ecological and developmental needs.

The Ministry of Environment and Forest in the CRZ Notification, 2019 declared the following areas as CRZ and imposed with effect from the date of the notification the restrictions on the setting up and expansion of industries, operations or processes and the like in the CRZ. The areas that are defined as CRZ as per CRZ Notification, 2019 are

(i) The land area from High Tide Line (HTL) to 500mts on the landward side along the sea front.

(ii) CRZ shall apply to the land area between HTL to 50 meters or width of the creek whichever is less on the landward side along the tidal influenced water bodies that are connected to the sea and the distance upto which development along such tidal influenced water bodies is to be regulated shall be governed by the distance upto which the tidal effects are experienced which shall be determined based on salinity concentration of 5 parts per thousand (ppt) measured during the driest period of the year and distance upto which tidal

effects are experienced shall be clearly identified and demarcated accordingly in the Coastal Zone Management Plans.

(iii) Land area between HTL and Low Tide Line (LTL) which will be termed as the intertidal zone.

(iv) The water and the bed area between the LTL to the territorial water limit (12 Nm) in case of sea and the water and the bed area between LTL at the bank to the LTL on the opposite side of the bank, of tidal influenced water bodies.

The Notification has clearly defined HTL as the line on the land upto which the highest water line reaches during the spring tide, as demarcated by the National Center for Sustainable Coastal Management (NCSCM) in accordance with the laid down procedures and made available to various coastal States and Union territories.

The Notification further classified CRZ area as CRZ – I, CRZ – II, CRZ – III and CRZ – IV for the purpose of conserving and protecting the coastal areas and marine waters. The CRZ – I include the areas that are ecologically sensitive and the geomorphological features which play a role in maintaining the integrity of the coast like (a) Mangroves(b) Corals and coral reefs (c) Sand Dunes (d) biologically active Mudflats (e) National parks, marine parks, sanctuaries, reserve forests, wildlife habitats and other protected areas (f) Salt Marshes (g) Turtle nesting grounds (h) Horseshoe crabs habitats (i) Seagrass beds (j) Nesting grounds of birds (k) Areas or structures of archeological importance and heritage sites being classified as CRZ-I A and the area between LTL and HTL being classified as CRZ-I B. The CRZ-II includes the developed land areas up to or

close to the shoreline, within the existing municipal limits or in other existing legally designated urban areas, which are substantially built-up with a ratio of built-up plots to that of total plots being more than 50% and have been provided with drainage and approach roads and other infrastructural facilities, such as water supply, sewerage mains, etc. The Land areas that are relatively undisturbed (viz. rural areas, etc.) and those which do not fall under CRZ-II are designated as CRZ–III. The CRZ-III is further classified as CRZ-III A and CRZ-III B based on the population density with a threshold value of 2161 per sq.km. as per 2019 census. The CRZ-IV includes the water area and the sea bed area between the Low Tide Line up to twelve nautical miles on the seaward side (CRZ-IV A) and the water area and the bed area between LTL at the bank of the tidal influenced water body to the LTL on the opposite side of the bank, extending from the mouth of the water body at the sea up to the influence of tide (CRZ-IV B), i.e. salinity of five parts per thousand (ppt) during the driest season of the year.

In order to protect and preserve the 'green lung' of the Greater Mumbai area, all open spaces, parks, gardens, playgrounds indicated in development plans within CRZ-II shall be categorized as No Development Zone and a Floor Space Index up to 15% shall be allowed only for construction of civic amenities, stadium and gymnasium meant for recreational or sports related activities and the residential or commercial use of such open spaces are not permissible as per notification. Construction of sewage treatment plants in CRZ-I area for the purpose of treating the sewage from the municipal area shall be taken only by

the municipal authorities in exceptional circumstances, where no alternate site is available to set up such facilities, subject to recommendations of the Coastal Zone Management Authority and approval by the Central Government and in case the construction of such plant is inevitable in a mangrove area, a minimum three times the mangrove area affected or destroyed or cut during the construction process shall be taken up for compensatory plantation of mangroves.

As per the guidelines, Cadastral (village) maps in 1:3960 or the nearest scale shall be used as the base maps. HTL and LTL will be demarcated by NCSCM, Chennai is used for superimposition on the cadastral map based on physical verification using coastal geomorphological signatures or features in accordance with the CRZ Notification issued by the Central Government.

In order to facilitate classification of Coastal Regulation Zones Government of India has approved few agencies / institutions across the Country vide *Lr. No. J17011/8/92-1A III, dated 08.08.2019* of Ministry of Environment and Forests. Institute of Remote Sensing, Anna University being one of them, has been carrying out HTL and LTL mapping following the guidelines issued by Ministry of Environment & Forests, Government of India.

1.2 Background

Jawaharlal Nehru Port Trust, Navi Mumbai – 400 707, Maharashtra has requested Institute of Remote Sensing, Anna University to prepare local level CRZ maps in 1:4,000 scale for the proposed Green Field Vadhavan Port in and aournd Vadhavan village in Dahanu taluka, Palghar district, Maharashtra state

by superimposing on approved CZMP as per CRZ notification, 2019. The HTL and LTL for the Sea/Bay/tidal influenced water bodies and ecologically sensitive areas are to be transferred from approved CZMP (Map nos. MH 95, 97, 98 & 99) at 1:25,000 scale to 1:4,000 scale for 7Km radius around the proposed project site. In this context, the proposed project site needs to be evaluated to assess whether it falls under regulations of CRZ notification, 2019. Hence IRS has taken up the work of superimposing project site on approved CZMP prepared by NCSCM.

1.3 Objective

The objective of the present study is to examine the site and prepare maps & report for the proposed Green Field Vadhavan Port in and around Vadhavan village in Dahanu taluka, Palghar district, Maharashtra state with reference to CRZ notification, 2019. Keeping in view of the requirements of notification, Institute of Remote Sensing, Anna University under took the project with the following agreed scope of work:

- Transfer of HTL and LTL for Arabian Sea indicated in existing approved CZMP as per CRZ notification, 2019 in the vicinity of the proposed project site on to georeferenced digital cadastral map.
- Transfer of HTL, LTL for Arabian Sea as indicated in approved CZMP in the vicinity of the project site by digitization from approved CZMP at 1:25,000 scale.

- Digitisation of ecologically sensitive entities, if any indicated in approved CZMP in the vicinity of project site.
- Superimposition of HTL, LTL and ecologically sensitive areas along with the project site on georeferenced cadastral map.
- Preparation of local level CRZ map at 1:4000 scale for 7Km radius around for the proposed project location.

1.4 Data Products

CZMP prepared as per CRZ notification 2019 and approved by MoEF & CC, New Delhi were used as reference for the transfer of HTL, LTL and ecologically sensitive areas in the vicinity of project site on to local level CRZ map. The data products used for the study and mapping include approved CZMP published by MCZMA (Map nos. MH 95, 97, 98 & 99) vide CRZ notification 2019 and cadastral maps of the local area.

1.5 Methodology

The cadastral maps of project site have been used as the base maps. The geomorphology of the coastal zone has been studied from the temporal medium resolution satellite data. Coastal geomorphologic features and existence of permanent vegetation identified from the satellite imagery were used to transfer the HTL demarcated by NCSCM on approved CZMP. The approved CZMP was georeferenced using graticules available on the maps.

The cadastral maps of villages in the study area were digitized from approved CZMP to create a vector dataset of survey polygons in the vicinity of

project location. The same are superimposed on satellite imagery to identify the proposed project location. The HTL, LTL and ecologically sensitive areas in the vicinity of project location are digitized from georeferenced approved CZMP. 50m, 200m & 500m setback lines from HTL for Arabian Sea and 50m or width of creek setback line from mangroves are generated using GIS buffering tool. The zones between LTL, HTL and setback lines are delineated to corresponding CRZ as per CRZ notification 2019.

2.0 STUDY AREA

2.1 Description of Study Area

The site for the proposed Green Field Vadhavan Port lies in and around Vadhavan village in Dahanu taluka, Palghar district, Maharashtra state. The complete port limit is shown in index sheet of CRZ maps (furnished separately along with this report) The key map showing the project site location is given in Figure 1.

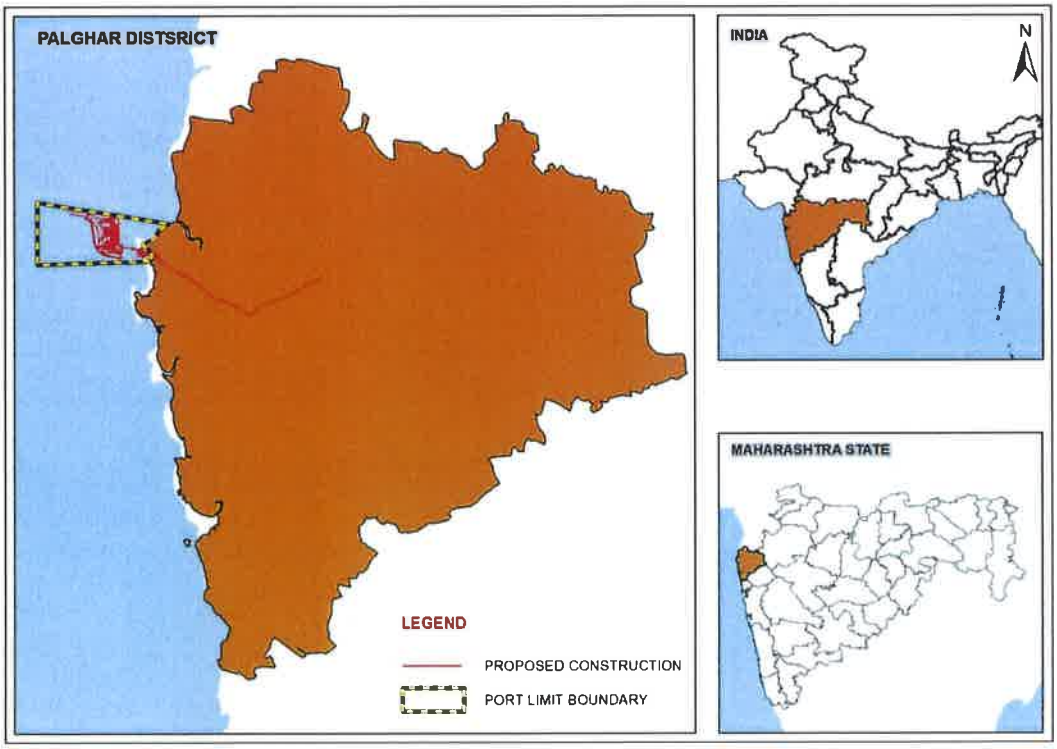


Fig. 1 Location of the project site

The project site location on satellite remote sensing image (Source: Google Earth) and approved CZMP are shown in Figure 2 and Figure 3 respectively. The coordinates of proposed port limit are given in Table 1.

Table 1 Coordinates of port limit boundary

Sl.No	Description	Label	Latitude	Longitude
1	Port Limit Boundary	A	19° 54' 26.000" N	72° 40' 30.000" E
		B	19° 57' 58.000" N	72° 42' 15.000" E
		C	20° 00' 00.000" N	72° 30' 00.000" E
		D	19° 54' 05.000" N	72° 30' 00.000" E
2	Proposed Offshore Reclamation Area	E	19° 58' 35.251" N	72° 36' 9.782" E
		F	19° 58' 36.270" N	72° 37' 25.479" E
		G	19° 55' 49.894" N	72° 37' 59.505" E
		H	19° 55' 5.493" N	72° 37' 48.259" E
		I	19° 55' 34.438" N	72° 36' 14.318" E
3	Proposed Navigational Area	J	19° 59' 21.027" N	72° 33' 0.839" E
		K	19° 58' 16.038" N	72° 36' 10.073" E
		L	19° 58' 37.112" N	72° 34' 33.636" E
		M	19° 58' 56.801" N	72° 32' 56.348" E
4	Proposed Sheltered Area	H	19° 55' 5.493" N	72° 37' 48.259" E
		L	19° 58' 37.112" N	72° 34' 33.636" E
5	Proposed Breakwater	N	19° 58' 32.043" N	72° 34' 24.504" E
		O	19° 54' 39.465" N	72° 37' 44.855" E
6	Proposed Approach Trestle	P	19° 54' 47.066" N	72° 37' 36.439" E
		Q	19° 55' 7.070" N	72° 39' 28.022" E
		R	19° 55' 42.908" N	72° 37' 59.609" E
		S	19° 55' 34.167" N	72° 39' 26.793" E
7	Proposed Reclamation Area near Shore	T	19° 55' 36.372" N	72° 39' 28.412" E
		U	19° 54' 26.761" N	72° 41' 27.532" E
		V	19° 54' 33.333" N	72° 40' 35.538" E
		W	19° 55' 22.603" N	72° 39' 15.493" E
8	Proposed Road	X	19° 55' 10.498" N	72° 40' 34.359" E
		Y	19° 50' 26.500" N	72° 50' 51.597" E
		Z	19° 52' 45.587" N	72° 56' 53.906" E
9	Proposed Railway Line	AA	19° 55' 8.191" N	72° 40' 32.196" E
		AB	19° 50' 56.385" N	72° 45' 47.335" E

PRINCIPAL CONSULTANT

DIRECTOR, IRS

Director
Institute of Remote Sensing
Anna University,
Chennai - 600 025.

2.2 Status as per Approved CZMP vide CRZ Notification 2019

- The proposed details viz Approach Trestle, Breakwater, Navigational Area, Offshore Reclamation Area, Sheltered Area within Vadhavan Port Limits lies in CRZ-IVA and Reclamation Area near Shore lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC
- The reclamation area near shore in within Vadhavan Port Limits lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA, and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC
- The remaining Area within Vadhavan Port Limits lies in CRZ-IA, CRZ-IA (50m Mangrove Buffer Zone), CRZ-IB, CRZ-III (No Development Zone), and CRZ-IVA areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC
- The proposed Road and Rail Alignment for the port connectivity lies in CRZ-IB, CRZ-III (200m to 500m from HTL), CRZ-III (No Development Zone) and Outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC. The detailed CRZ status is depicted in Table.2. (Refer local level CRZ map)

PRINCIPAL CONSULTANT

DIRECTOR, IRS

Director
Institute of Remote Sensing
Anna University,
Chennai - 600 025.

3.0 RESULTS AND CONCLUSIONS

3.1 Results

The HTL and LTL of Arabian sea, creek as indicated in approved and draft CZMP were superimposed on to georeferenced cadastral map along with ecologically sensitive areas in the vicinity of project site. Setback lines of 200m , 500m for Arabian sea and 50 m or width of creek/ tidal influenced inland water body as indicated in approved CZMP were superimposed on to georeferenced base map to prepare local level CRZ map at 1:4.000 scale for 7Km radius around the project site (Annexure IV). The co-ordinates of selected points on HTL line derived from approved CZMP in WGS 84 system are presented in Annexure I. The satellite imagery of project site is presented for reference (Annexure II). The approved CZMP at 1:25,000 scale superimposed with project activities is presented in Annexure III.

3.2 Conclusion

- The proposed details viz Approach Trestle, Breakwater, Navigational Area, Offshore Reclamation Area, Sheltered Area within Vadhavan Port Limits lies in CRZ-IVA and Reclamation Area near Shore lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC
- The reclamation area near shore in within Vadhavan Port Limits lies in CRZ-IB, CRZ-III(200m to 500m from HTL), CRZ-III (No Development Zone), CRZ-IVA, and outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC

- The remaining Area within Vadhavan Port Limits lies in CRZ-IA, CRZ-IA (50m Mangrove Buffer Zone), CRZ-IB, CRZ-III (No Development Zone), and CRZ-IVA areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC
- The proposed Road and Rail Alignment for the port connectivity lies in CRZ-IB, CRZ-III (200m to 500m from HTL), CRZ-III (No Development Zone) and Outside CRZ areas as per approved CZMP (Map nos: MH 95, 97, 98 & 99) vide CRZ notification 2019 of MoEF & CC. The detailed CRZ status is depicted in Table.2. (Refer local level CRZ map)

Table.2 Project site details in CRZ

Development of Vadhavan Port- Port limit details in CRZ					
Sl,No	**Description**	**Project Details**	**CRZ-Classification**	**Area in Acres**	**Total Area in Acres**
1	Area for proposed development within Vadhavan Port Limits	Approach Trestle	CRZ-IVA	45.26	8763.20
		Breakwater	CRZ-IVA	444.36	
		Navigational Area	CRZ-IVA	3004.28	
		Offshore Reclamation Area	CRZ-IVA	3388.87	
		Reclamation Area near Shore	CRZ-IB	131.67	
			CRZ-III (200m to 500m from HTL)	12.14	
			CRZ-III (NDZ)	22.86	
			CRZ-IVA	417.80	
			Outside CRZ	49.56	
		Sheltered Area	CRZ-IVA	1246.41	

Sl,No	Description	Project Details	CRZ-Classification	Area in Acres	Total Area in Acres
2	Remaining Area within Vadhavan Port Limits	Nil	CRZ - IA (50m Mangrove Buffer)	126.48	33214.37
			CRZ - IA	98.25	
			CRZ-IB	426.28	
			CRZ-III-NDZ	19.71	
			CRZ-IVA	32543.64	
Grand Total				**41977.57**	**41977.57**
Sl,No	**Description**	**Project Details**	**CRZ-Classification**	**Length in Meters**	**Total Length in Meters**
3	Proposed Road alignment for the port connectivity	Proposed Road	CRZ-IB	277.29	34033.32
			CRZ-III(200m to 500m from HTL)	257.89	
			CRZ-III-NDZ	491.77	
			Outside CRZ	33006.36	
4	Proposed Rail alignment for the port connectivity	Proposed Railway Line	CRZ-IB	217.26	21735.45
			CRZ-III(200m to 500m from HTL)	355.71	
			CRZ-III-NDZ	514.39	
			Outside CRZ	20648.10	
Grand Total				**55768.77**	**55768.77**

The following disclaimers are followed in the CRZ map and report preparation:

1. Coastal Regulation Zone Map of the site is prepared considering Approved CZMP as per CRZ Notification 2019 of MoEF&CC, GoI

2. Superimposition of the project site on approved CZMP is subject to scale and generalisation error.

3. This report is to be referenced and used along with the map bearing the same reference no: Ref No.AU/IRS/MS/215-2022 DT 04.11..2022

4. The DGPS survey was carried out specific to the referred project site boundary only. Hence, validation of HTL and CRZ boundary is limited to the clearance of the same. Institute of Remote Sensing do not carry responsibility for CRZ status of other plots or neighbourhood.

PRINCIPAL CONSULTANT

DIRECTOR, IRS

Director
Institute of Remote Sensing
Anna University,
Chennai - 600 025

ANNEXURE I

Coordinates of HTL Reference Points(WGS 84)

HTL Point	Latitude	Longitude
1	19° 58' 55.591" N	72° 43' 12.361" E
2	19° 58' 24.813" N	72° 42' 59.836" E
3	19° 58' 15.028" N	72° 43' 19.857" E
4	19° 58' 38.976" N	72° 43' 19.924" E
5	19° 58' 58.805" N	72° 43' 22.513" E
6	19° 58' 44.023" N	72° 43' 19.952" E
7	19° 58' 58.831" N	72° 43' 32.560" E
8	19° 58' 51.588" N	72° 43' 33.229" E
9	19° 58' 47.962" N	72° 43' 34.023" E
10	19° 58' 42.764" N	72° 43' 28.684" E
11	19° 58' 33.017" N	72° 43' 21.527" E
12	19° 58' 22.819" N	72° 43' 28.205" E
13	19° 56' 37.861" N	72° 43' 19.950" E
14	19° 56' 46.808" N	72° 43' 22.844" E
15	19° 56' 43.402" N	72° 43' 33.797" E
16	19° 56' 51.023" N	72° 43' 24.987" E
17	19° 56' 48.416" N	72° 43' 34.332" E
18	19° 56' 55.507" N	72° 43' 26.506" E
19	19° 56' 44.497" N	72° 43' 14.384" E
20	19° 56' 47.652" N	72° 43' 06.582" E
21	19° 56' 57.534" N	72° 43' 08.358" E
22	19° 56' 53.757" N	72° 43' 16.637" E
23	19° 56' 58.799" N	72° 43' 29.424" E
24	19° 57' 12.639" N	72° 43' 35.143" E
25	19° 57' 19.981" N	72° 43' 25.592" E
26	19° 57' 23.208" N	72° 43' 9.629" E
27	19° 57' 26.636" N	72° 42' 56.895" E
28	19° 57' 34.198" N	72° 42' 49.601" E
29	19° 57' 38.454" N	72° 42' 43.621" E
30	19° 57' 42.176" N	72° 42' 56.323" E
31	19° 57' 43.079" N	72° 43' 06.772" E
32	19° 57' 52.327" N	72° 43' 05.543" E
33	19° 57' 59.162" N	72° 43' 13.987" E
34	19° 57' 56.607" N	72° 42' 48.090" E
35	19° 57' 58.788" N	72° 43' 01.906" E
36	19° 58' 02.824" N	72° 43' 15.860" E
37	19° 58' 06.514" N	72° 42' 59.721" E
38	19° 58' 07.393" N	72° 42' 41.898" E
39	19° 58' 02.853" N	72° 42' 25.012" E
40	19° 57' 52.635" N	72° 42' 12.908" E
41	19° 57' 44.151" N	72° 42' 5.250" E
42	19° 57' 37.412" N	72° 41' 51.178" E

HTL Point	Latitude	Longitude
43	19° 57' 30.226" N	72° 41' 48.612" E
44	19° 57' 36.298" N	72° 41' 56.676" E
45	19° 57' 38.388" N	72° 42' 08.563" E
46	19° 57' 28.064" N	72° 42' 13.288" E
47	19° 57' 38.006" N	72° 42' 03.928" E
48	19° 57' 30.279" N	72° 41' 45.555" E
49	19° 57' 29.190" N	72° 41' 32.297" E
50	19° 57' 33.396" N	72° 41' 42.406" E
51	19° 57' 37.840" N	72° 41' 47.672" E
52	19° 57' 34.058" N	72° 41' 36.508" E
53	19° 57' 27.428" N	72° 41' 27.354" E
54	19° 57' 19.303" N	72° 41' 17.189" E
55	19° 57' 09.307" N	72° 41' 12.308" E
56	19° 56' 57.663" N	72° 41' 11.318" E
57	19° 56' 50.324" N	72° 41' 03.178" E
58	19° 56' 40.198" N	72° 40' 57.573" E
59	19° 56' 34.769" N	72° 41' 06.578" E
60	19° 56' 25.564" N	72° 41' 03.390" E
61	19° 56' 19.006" N	72° 40' 55.724" E
62	19° 56' 34.011" N	72° 40' 52.666" E
63	19° 56' 30.054" N	72° 40' 44.899" E
64	19° 56' 25.947" N	72° 40' 37.311" E
65	19° 56' 17.822" N	72° 40' 32.127" E
66	19° 56' 13.541" N	72° 40' 18.516" E
67	19° 56' 10.176" N	72° 40' 13.891" E
68	19° 56' 17.433" N	72° 40' 24.750" E
69	19° 56' 22.823" N	72° 40' 33.664" E
70	19° 56' 18.190" N	72° 40' 20.579" E
71	19° 56' 09.497" N	72° 40' 08.693" E
72	19° 56' 05.198" N	72° 39' 55.075" E
73	19° 55' 55.255" N	72° 39' 50.958" E
74	19° 55' 47.372" N	72° 39' 54.926" E
75	19° 55' 39.406" N	72° 40' 11.275" E
76	19° 55' 32.206" N	72° 40' 19.822" E
77	19° 55' 22.875" N	72° 40' 28.517" E
78	19° 55' 16.225" N	72° 40' 35.180" E
79	19° 55' 06.839" N	72° 40' 42.774" E
80	19° 54' 57.519" N	72° 40' 44.665" E
81	19° 55' 00.305" N	72° 40' 57.036" E
82	19° 54' 56.773" N	72° 40' 47.916" E
83	19° 55' 02.387" N	72° 40' 41.108" E
84	19° 55' 12.369" N	72° 40' 35.681" E
85	19° 55' 15.654" N	72° 40' 29.369" E
86	19° 55' 03.366" N	72° 40' 35.823" E
87	19° 54' 49.989" N	72° 40' 37.870" E
88	19° 54' 39.362" N	72° 40' 38.217" E
89	19° 54' 29.600" N	72° 40' 34.256" E

HTL Point	Latitude	Longitude
90	19° 54' 16.692" N	72° 40' 33.717" E
91	19° 54' 08.227" N	72° 40' 39.232" E
92	19° 54' 08.713" N	72° 40' 55.625" E
93	19° 54' 19.721" N	72° 40' 55.376" E
94	19° 54' 27.250" N	72° 40' 57.580" E
95	19° 54' 34.873" N	72° 41' 04.256" E
96	19° 54' 34.059" N	72° 41' 14.562" E
97	19° 54' 31.877" N	72° 41' 19.269" E
98	19° 54' 38.022" N	72° 41' 24.233" E
99	19° 54' 34.403" N	72° 41' 21.740" E
100	19° 54' 32.362" N	72° 41' 12.797" E
101	19° 54' 34.276" N	72° 41' 06.120" E
102	19° 54' 26.732" N	72° 41' 00.957" E
103	19° 54' 19.132" N	72° 41' 00.036" E
104	19° 54' 10.131" N	72° 41' 01.300" E

Source: Approved CZMP 2019 (Map Nos : MH 95,97,98 & 99)

PRINCIPAL CONSULTANT

DIRECTOR, IRS

Director
Institute of Remote Sensing
Anna University,
Chennai - 600 025.

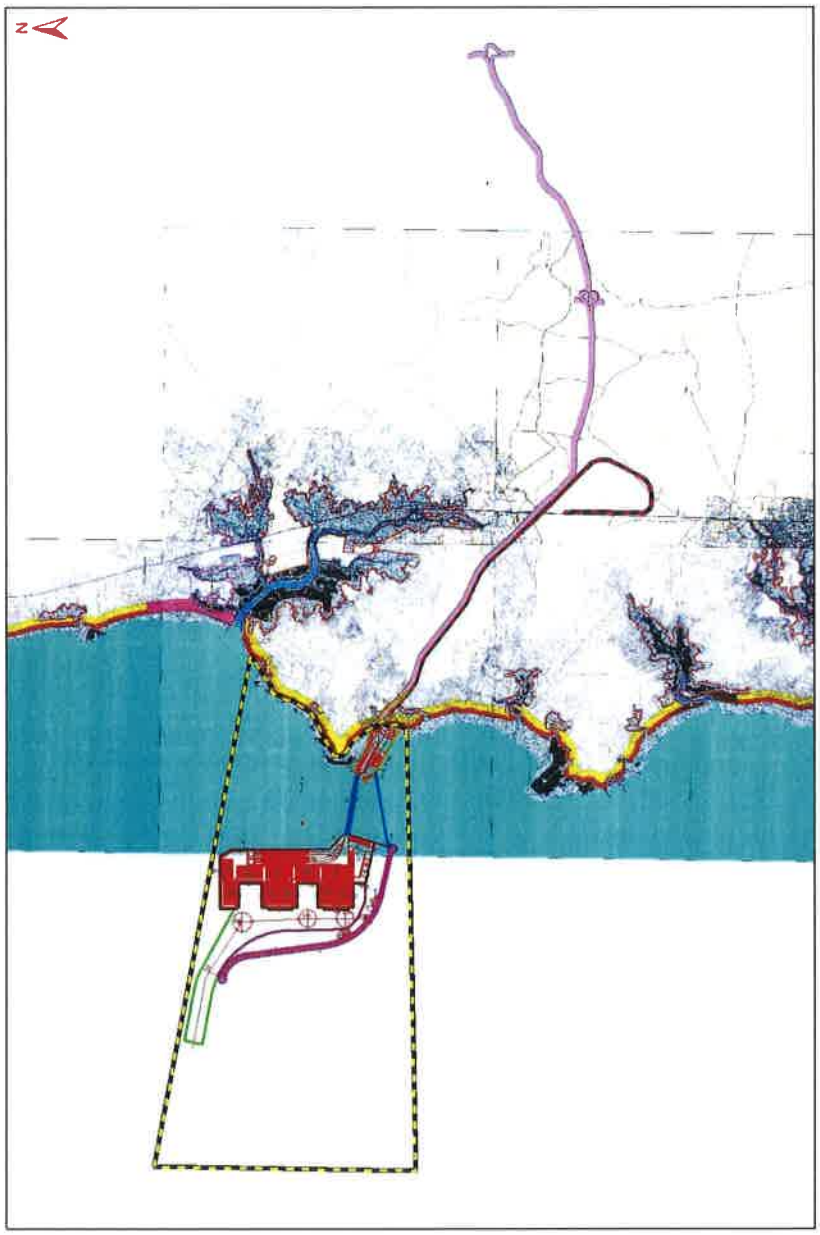
ANNEXURE II

Satellite Imagery of the project site

(Source: Google Earth)

ANNEXURE III

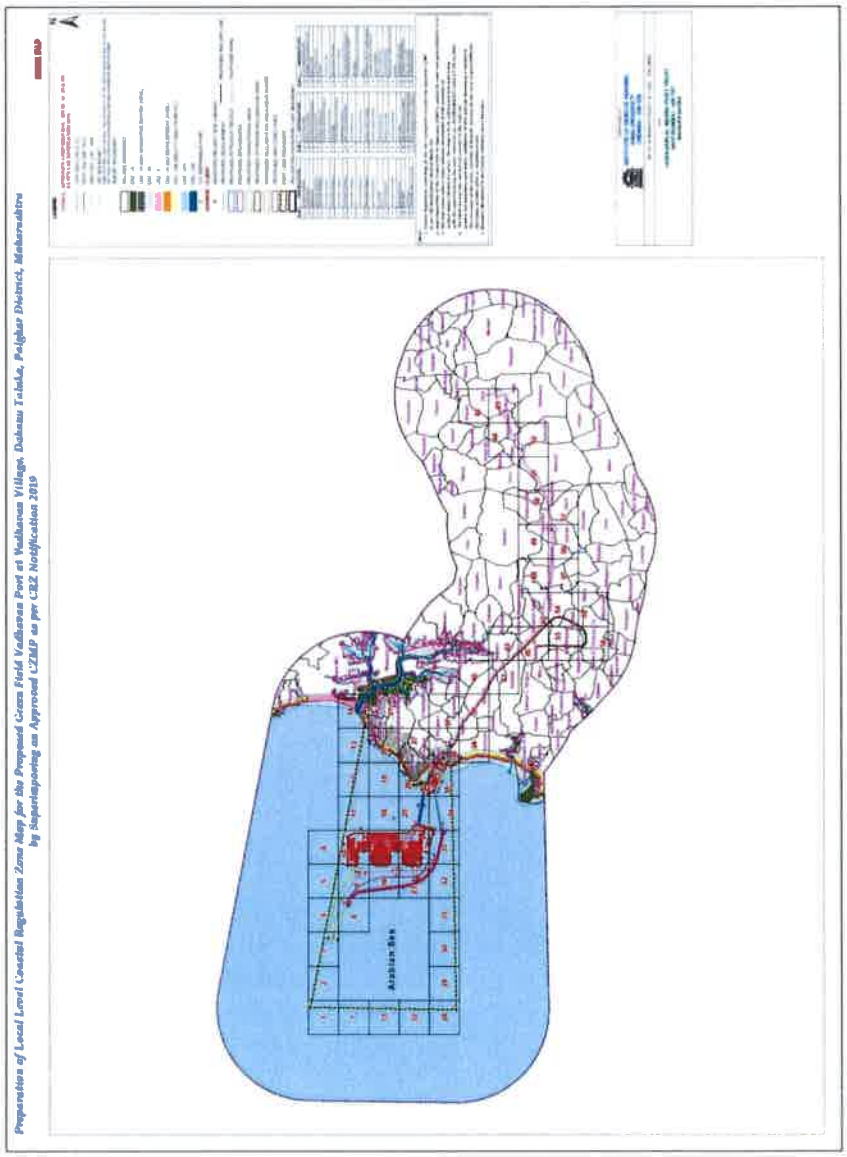
Project site overlaid on Approved CZMP



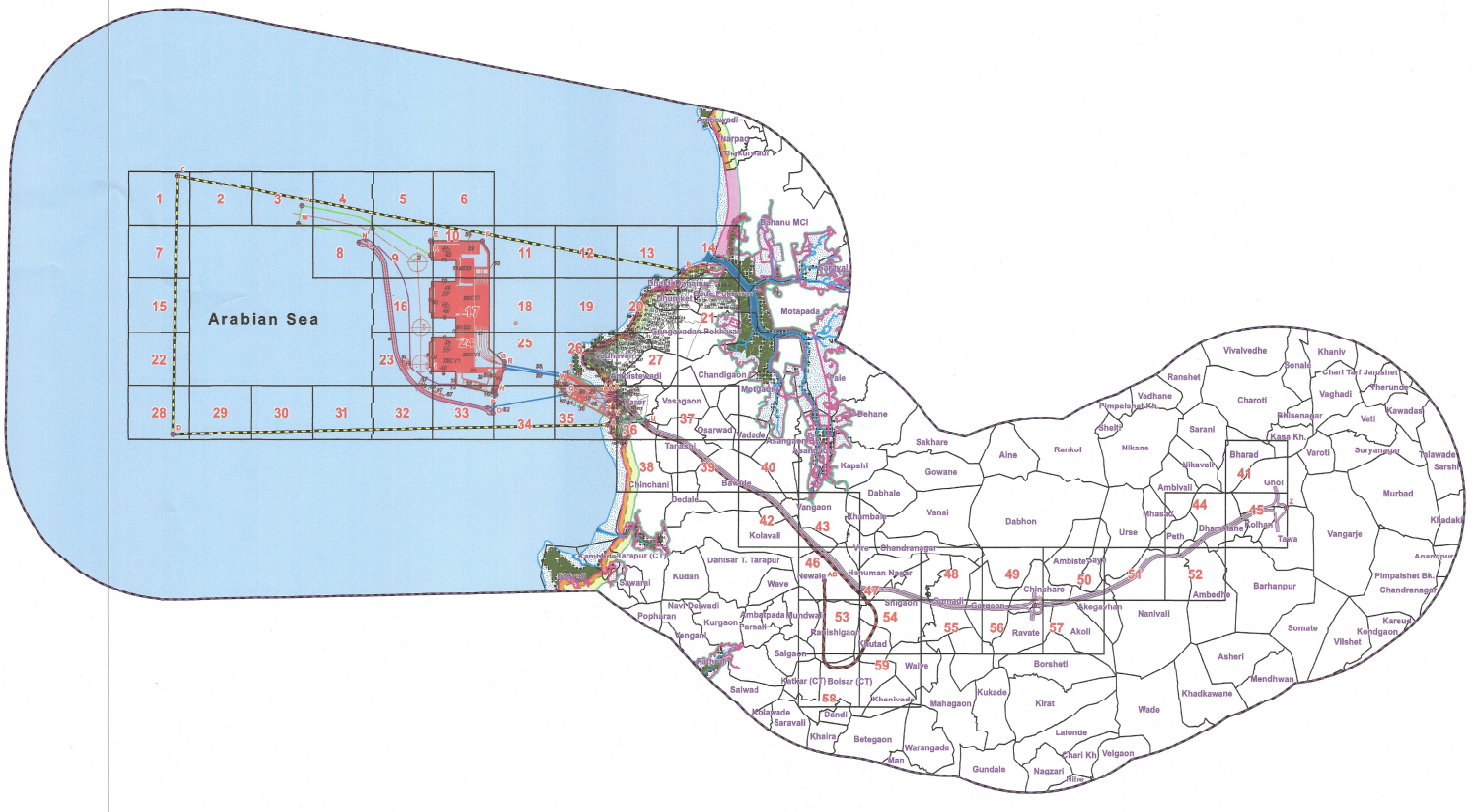
Source: Approved CZMP 2019 (Map Nos : MH 95,97,98 & 99)

ANNEXURE IV

Local Level Coastal Regulation Zone Map on 1: 4000 scale for 7Km radius around the Project Site



Preparation of Local Level Coastal Regulation Zone Map for the Proposed Green Field Vadhavan Port at Vadhavan Village, Dahanu Taluka, Palghar District, Maharashtra
by Superimposing on Approved CZMP as per CRZ Notification 2019



INDEX MAP

LEGEND

SOURCE : APPROVED CZMP (MAP NOS : MH 95, 97, 98 & 99) AS PER CRZ NOTIFICATION 2019

- LOW TIDE LINE (LTL)
- HIGH TIDE LINE (HTL)
- 200m CRZ LINE - NDZ
- CRZ BOUNDARY (500m FOR SEA, 50m FOR BAY, 50m OR WIDTH OF THE CREEK WHICHEVER IS LESS ALONG THE TIDAL INFLUENCED WATER BODIES AND 50m MANGROVE BUFFER ZONE)
- SURVEY BOUNDARY
- VILLAGE BOUNDARY
- CRZ - IA
- CRZ - IA (50m MANGROVE BUFFER ZONE)
- CRZ - IB
- CRZ - II
- CRZ - III (NO DEVELOPMENT ZONE)
- CRZ - IIIB (200m TO 500m FROM HTL)
- CRZ - IVA
- CRZ - IVB
- HTL REFERENCE POINT

SOURCE : CLIENT

- PROPOSED PROJECT SITE CORNER
- PROPOSED DEVELOPMENT
- PROPOSED APPROACH TRESTLE
- PROPOSED BREAKWATER
- PROPOSED NAVIGATIONAL AREA
- PROPOSED OFFSHORE RECLAMATION AREA
- PROPOSED RECLAMATION AREA NEAR SHORE
- PROPOSED SHELTERED AREA
- PORT LIMIT BOUNDARY
- 7Km BUFFER FROM PORT LIMIT BOUNDARY
- PROPOSED RAILWAY LINE
- PROPOSED ROAD

SL.NO.	PROPOSED ACTIVITIES
1	ENTRANCE CHANNEL
2	TURNING BASIN
3	BREAKWATER
4	CONTAINER TERMINAL 1
5	CONTAINER TERMINAL 2
6	CONTAINER TERMINAL 3
7	CONTAINER TERMINAL 4
8	CONTAINER TERMINAL 5
9	CONTAINER TERMINAL 6
10	CONTAINER TERMINAL 7
11	CONTAINER TERMINAL 8
12	CONTAINER TERMINAL 9
13	MULTIPURPOSE BERTHS
14	RO-RO BERTH
15	COAST GUARD BERTH
16	TUG/PILOT CRAFT BERTH
17	BULK LIQUID JETTIES
18	BULK LIQUID
19	OTHER LIQUID
20	CONTAINER YARD (CY 1 TO CY 9)
21	IN PORT RAIL YARD
22	CHEMICAL TANK FARM
23	RAIL YARD FOR OTHER CARGOES
24	EDIBLE OIL TANK FARM
25	COVERED STORAGE SHED
26	UNDERGROUND WATER STORAGE TANK WITH PUMP ROOM
27	UTILITY AREA
28	TRAILOR PARKING FOR CONTAINER TERMINAL (CY 1 TO CY 9)
29	PORT OPERATIONS BUILDING
30	(NPT) ADMIN BUILDING
31	BULK LIQUID TANK FARM
32	GENERAL CARGO STORAGE
33	COASTAL CARGO STORAGE
34	RO-RO STORAGE AREA
35	PDI FACILITY FOR CARS
36	OTHER LIQUID TERMINAL
37	UTILITY AREA
38	AREA FOR FUTURE DEVELOPMENT
39	MAIN RECEIVING SUBSTATION (MRSS)
40	BERTH ELUCIDATION (BES-1 TO BES-9)
41	UTILITY SUBSTATION (UHS)
42	COMMON PORT INFRASTRUCTURE
43	ROAD TO PORT
44	PRE ENTRY/EXIT GATE
45	FLYOVER
46	OVERHEAD TANK
47	MAIN SUBSTATION (MRS)
48	**
49	TRAILER PARKING AT ENTRY & EXIT
50	APPROACH TRESTLE TO ROAD MOVEMENT
51	TRAILER PARKING FOR MULTIPURPOSE BERTH
52	APPROACH TRESTLE TO BREAKWATER
53	COMMON APPROACH TRESTLE TO MAHIM TERMINAL
54	COAST GUARD AREA
55	RECLAMATION SLIND
56	PARKING FOR CHEMICAL & EDIBLE OIL TANKERS
57	SEA WATER PUMP HOUSE
58	APPROACH TRESTLE FOR RAIL
59	PORT USER BUILDING
60	INCINERATION AREA

Note:

1. *Coastal Regulation Zone Map of the site is prepared considering Approved CZMP as per CRZ Notification 2019 of MoEF, GoI*
2. *Superimposition of the Project Site on Approved CZMP is subject to scale and generalisation error*
3. *The map comes with a report wherein description of CRZ zonation of project layout details are given. This map is to be referenced and used along with the report bearing the same reference no: AU/IRS/MS/215-2022 DT. 04.11.2022*
4. *The DGPS Survey was carried out specific to the referred project site boundary only hence, validation of HTL and CRZ Boundary is limited to the clearance of the same. Institute of Remote Sensing do not carry responsibility for CRZ status of other plots or neighbourhood.*
5. *Numbers Mentioned in Red Colour indicates Sheet Numbers*

SCALE 1 : 100,000

0 1,000 2,000 4,000 6,000 8,000 10,000 M

PREPARED BY

INSTITUTE OF REMOTE SENSING
ANNA UNIVERSITY
CHENNAI - 600 025

REF NO. AU/IRS/MS/215-2022 DT. 04.11.2022 *(Oct. 2023)*

FOR

JAWAHARLAL NEHRU PORT TRUST
NAVI MUMBAI - 400 707
MAHARASHTRA

PREPARED BY	
VERIFIED BY	
APPROVED BY	Prof. D. Thirumalaivasan, B.E.M.Tech.,Ph.D., Director, Institute of Remote Sensing, Anna University, Chennai-600 025.