Government of Maharashtra
Office of the Chief Engineer
Special Project Region, Public Works Department
4th Floor, Bandhkam Bhavan, Murzaban Road, Fort, Mumbai.400001.

Telephone No.:- 022-2207 2510	Email id :- sp.ce@mahapwd.com
No./CE.SP/D-2/ 202	Date : 25 JAN 2018

To
Director, IA-III/ Member Secretary (Expert Appraisal Committee: Infra-2)
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi – 110 003

30/1/18

Sub: Submission of Compliance on Minutes of the 22nd Meeting regarding proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapati Shivaji Maharaj in the Arabian Sea off the coast of Mumbai, Maharashtra; Regarding **Environmental Clearance.**
(Proposal No. IA/MH/MIS/60961/2015; File No. 11-4/2015-IA-III)

Dear Sir,

The Proposed project of construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapati Shivaji Maharaj in the Arabian Sea off the coast of Mumbai, Maharashtra was granted CRZ and Environmental Clearance(EC) by the MoEF&CC vide their letter F. No 11-4/2015-IA-III dated 23.02.2015.

Thereafter, an application for amendment to EC & CRZ Clearance was submitted to MoEF&CC due to change in earlier proposal of the project in compliance with the conditions stipulated in the earlier EC.

Subsequently, the project proponent made a presentation before Expert Appraisal Committee (EAC) on 13th September, 2017. The Expert Appraisal Committee (Infra-2) during its 22nd meeting sought additional information on six (6) points and asked to route the proposal through MCZMA. In compliance with the above, response on six (6) points are as below:

S. No.	Additional Information sought by EAC	Response
i.	Recommendation of MCZMA for the proposed change/modification.	The MCZMA has recommended the proposed change/modification in the project through Minutes of 122nd meeting held on 30thOctober 2017 (item no. 39) to MoEF, New Delhi for further decision. Recommendation of MCZMA enclosed as **Annexure I.**
ii.	Details of the Court cases PIL No. 06/2017 in the Bombay High Court and Application No 108/2016 filed in the NGT (Western Bench), Pune.	Enclosed as **Annexure II.**
iii.	Is reclamation of the Island a part of the project or the Reclaimed Island already exists? Impact on island ecology.	The reclamation of the Island is a part of the project. The impact has been considered in EIA study. The abstract of the impacts is enclosed as **Annexure III.**

S. No.	Additional Information sought by EAC	Response
iv.	Environmental Impacts of the proposed changes on the marine biota and fishery activities and other terms of reference as for the earlier EIA.	Enclosed as **Annexure IV.**
v.	The need for a public hearing and was it done earlier	The MOEF&CC already exempted Public hearing for the project in view of Gazette notification amendment dated 17 February 2015. Also refer to original EC granted dated 23rd Feb 2015, Para 2 (xxxiv) under **Annexure V.**
vi.	The disposal of effluents from desalination plant	The proposed plan for disposal of effluent from desalination plant is enclosed as **Annexure VI.** Disposal is discharged in sea only when effluent is within the permissible limit.

In view of the above, you are hereby requested to take a prompt action towards issuance of the amendment to EC.

Thanking you.

Chief Engineer,
Special Project (PW),
Mumbai.

Copy to Superintending Engineer, Mumbai Construction Circle, Chembur, Mumbai for information and necessary action.
Copy to Executive Engineer, CSMMP Division, Cuff parade, Mumbai for information and necessary action.
Copy to M/s. Egis India Consulting Engineers Pvt. Ltd., Mumbai for information and necessary
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Recommendation of MCZMA for the proposed change/Modification

Extracts of

Minutes of 122nd meeting of the Maharashtra Coastal Zone Management Authority held on 30th October, 2017

Item No. 39: **Amendment in Proposed Chattrapati Shivaji Maharaj Meorial in the Arbian Sea at Mumbai by PWD**

The project proponent presented the proposal before the Authority. The proposal is for amendment in Proposed Chattrapati Shivaji Maharaj Meorial in the Arbian Sea at Mumbai.

Proposed Monument of Chhatrapati Shivaji Maharaj in the Arabian Sea, Mumbai was deliberated in the 88th & 9th meeting of the MCZMA held on 31st January, 2014 and 23rd January, 2015 respectively. The Ministry of Environment, Forests & Climate Change vide letter dated 23rd February 2015 accorded Environmental and CRZ Clearance for the Proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapat Shivaji Maharaj in the Arabian Sea of the Coast of Mumbai, Maharashtra.

During the subsequent detail planning of the project, Govt. of Maharashtra has made certain changes in earlier proposed plans. The changes have been tabulated as follows-

S. No.	Project Feature	Original Proposal	Revised Proposal	Remarks/Additional Impacts on Environment
1	Overall statue height	190 m (including pedestal: 30m and Statue: 160 m)	210 m (including pedestal: 84 m & Statue: 126 m) wrt MSL	Overall height increased No additional impact on environment NOC from AAI for increased height received on 27 Jul 2017
2	Area of proposed island reclamation	Area: 15.6 Ha	Planned in two phases : Phase I: 7.18 hectare & Phase II: 5.97 hectares	No additional impact on environment envisaged. Location is same

Member Secretary

Chairman

Minutes of 122nd meeting of the Maharashtra Coastal Zone Management Authority held on 30th October, 2017

3	Sea Wall height	13 m	14 m	Sea wall height increased 1 meter achieving no splash zone (14m) No additional impact on environment has been envisaged
4	Pedestal Design	Three layer pedestal: First level of pedestal: 140m X 140m X 10m Second level of pedestal: 110m X 110m X 10m Third level of pedestal: 80m X 80m X 10m	Two tiered structure stepping back to create stepped tier effect. The size of the pedestal is maximum 160m x 60m in plan	Height & Size of pedestal increased No additional impact on environment has been envisaged.

Member Secretary

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Minutes of 122nd meeting of the Maharashtra Coastal Zone Management Authority held on 30th October, 2017

5	Transportation of Construction material	Ready mix concrete of M60 grade will be pumped from the Raj Bhavan side through 30 mm diameter HDPE pipeline with help of pump of capacity 4000 HP.	Ready mix concrete mounted barges will be used for transport of M60 grade concrete till the island reclaimed. After reclamation of island, the material will be transported on barges from to the batching plant to be installed on the proposed island.	Mode of transportation of construction material has been changed Adequate measure to prevent contamination due to material transport and handling has already been proposed. Hence, no additional impact on environment is envisaged.
6	Break water layer	The armour layer of breakwater will be made of tetrapod.	The armor layer is proposed of suitable secondary layer units	The armor layer material is changed. No additional impact on environment has been envisaged.
7	Fortified Wall	The fortified wall will be made of concrete structure	The fortified wall will be made of laterite stone with lime cement mortar.	Construction material of fortified wall has been changed No additional impact on environment has been envisaged

Earlier area assigned for infrastructure facilities are as follows-

S. No.	Description	Area (Sqm)
1	Total Area Cover (Rock Surface Area)	156000.00
2	Area of pedestal at ground floor	16237.00
3	Area of pedestal at first floor	10024.00
4	Area of pedestal at second floor	5302.00

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5	Area of residence for staff security	6000.00
6	Roads and platforms	28410.00
7	STP & WTP	409.00
8	Public Toilets	300.00
9	Helipad	790.00
10	Jetty (2 main, 1 jetty for VIP and 1 jetty for service)	100 X 12

Revised proposed area assigned for infrastructure facilities are as follows-

S. No.	Description	Area (Sqm)		
		Phase-I	Phase-II	Total
1	Site Area	71822.56	59720.44	131543.0
2	Ground Coverage	18353.09	17255.62	35608.71
3	Built Up Area Of Ancillary Buildings	11245.72	-	11245.72
4	Built Up Area Of Pedestal	48624.17	-	48624.17
5	Total Built-up Area	59869.9	17255.62	77125.52
6	Green area	18154.68	24389.78	42544.46
7	Hard scaped area	35314.79	18075.04	53389.83
8	VIP jetty (1 no.)	1386.32	-	1386.32
9	Visitors jetty (1 No.)	1083.30	-	1083.3
10	Oceanarium	-	10431.07	10431.07
11	Convention centre	-	6824.55	6824.55

After detailed deliberation and discussion, the Authority decided to recommend the above changes made in proposal of the proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of

Member Secretary

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Minutes of 122nd meeting of the Maharashtra Coastal Zone Management Authority held on 30th October, 2017

11	Convention centre	-	6824.55	6824.55

After detailed deliberation and discussion, the Authority decided to recommend the above changes made in proposal of the proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapat Shivaji Maharaj in the Arabian Sea of the Coast of Mumbai, to MoEF, New Delhi for further appropriate decision in the matter, as per provisions of CRZ Notification, 2011. This recommendation is subject to final order of the NGT in the matter.

Item No. 40: **Proposed project of 1) Garden at Reservation No. 353, S. No. 1, Penkarpada, 2) construction of the compound wall for ground at Chowk, 3) constrution of toilwt in parking lot at reservation no. 184, Bhaindar East, 4) construction of multipurpose hall at sector no. 9, Shanti Nagar, Mir Road (W), 5) construction of the road with drains from express Inn Hotel to Versova, MBMC, Dist. Thane by MBMC**

The project proponent was absent for the meeting. Hence, the matter was deferred.

Item No. 41: **Regarding plot bearing CTS No. 36 (A) & 36 (B) of village Goregaon at S. V. Road, Goregaon (W), Mumbai by M/s Acme Metal Industrial Pvt. Ltd.**

The Authority noted that the PP has claimed that the plot bearing CTS No. 36 (A) & 36 (B) of village Goregaon at S. V. Road, Goregaon (W), Mumbai is situated outside CRZ area. The PP claimed that the said stretch of the creeklet is not tidally influenced, which has salinity concentration less than 5 ppt. The PP further submitted that the Ministry of Environment, Forest and climate change, new Delhi has deleted certain plots in the vicinity of the PP's plot from the CRZ purview.

The Authority in its 119th meeting held on 29-30th June, 2017 decided that the PP need to submit the distance of the plot from the HTL of the creeklet. The PP may submit the remarks of the MCGM stating the distance of the plot under reference from the HTL of the approved CZMP of Mumbai.

The Authority noted that the PP has submitted the buildings plans approved by the MCGM and stated that buildings plans were approved in Non CRZ portion of

Annexure II

Application No 108 / 2016 filed in NGT (Western Bench), Pune

Introduction

1. The application is filed under Section 15(a), 15(b), 15(c), 15(2), 15(3) and 14(1) read with Section 18(1) and 20 of NGT Act 2010. The applicant has made prayer to set aside the CRZ and Environmental Clearance already accorded on 23 Feb 2015.
2. The applicant has submitted Miscellaneous Application (MA) 35 / 2017 for condonation of delay.

Present Status

1. Government of Maharashtra and MOEF&CC have contested both above applications.
2. **The application for condonation of delay is yet to be decided by the Tribunal.**

PIL No 06 / 2017 in Honorable Bombay High Court

Introduction

1. The petitioner has prayed for quashing the project in view of other pressing infrastructure development in the state of Maharashtra.

Present Status

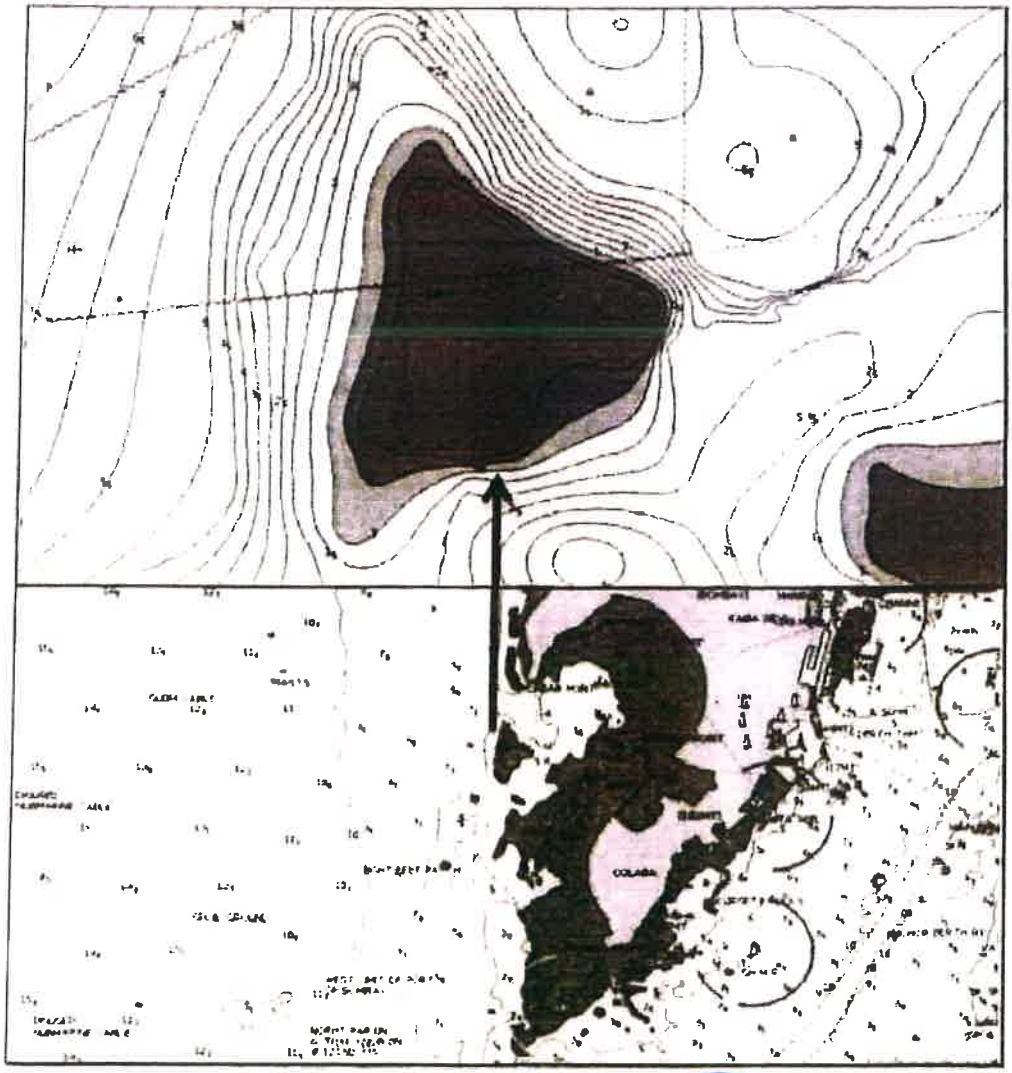
1. The Government of Maharashtra has contested the PIL and has submitted Para-wise comments / response. The petitioner has filed the rejoinder. Reply to rejoinder by Government of Maharashtra is under preparation and shall be submitted to the Court in due course.
2. **The PIL is not yet admitted by the Honorable Bombay High Court.**

Is reclamation of the Island a part of the project or the Reclaimed Island already exists? Impact on island ecology.

The Island

The reclamation of the Island is a part of the proposed project. In current scenario the proposed site is a reef like basalt outcrop located at 18°55'33"N and 72°47'25"E situated at the intersection of the Back Bay and the Arabian Sea. Usually the site is submerged at high tide and the rock emerges at low tide.

The water depth contours around the island in Figures below.



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It can be seen from the above figure that the green portion of the island is a rock out crop at + 1.6m above the Chart Datum. In the NE side of the island, 5.0m contour runs at a distance of 200m from the island edge. In the SE side of the island, 2.0m contour runs at a distance of 200m from the island. Similarly, in the Western coast of island facing to sea, 5.0m contour runs at a distance of 400m from the island and in the Southern corner the 4.0m contour circles at 250m distance from island shore.

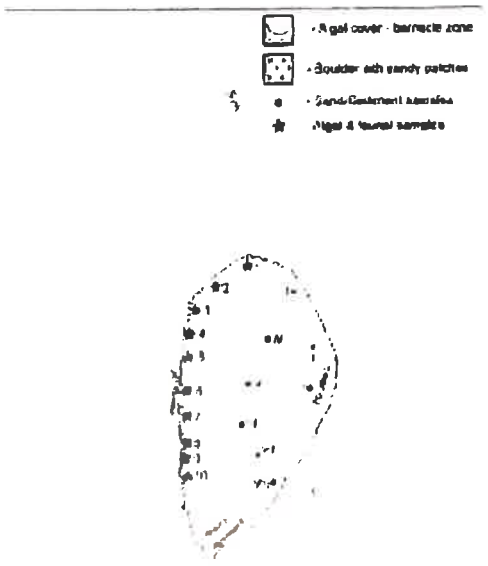
Impact on island ecology

The Environmental Impact Assessment Study for the proposed project has been carried out by CSIR - National Institute of Oceanography (NIO) and CSIR -National Environmental Engineering Research Institute (NEERI).

Their study findings are furnished in below sections.

The baseline survey for assessing the sediment texture and phytal-fauna (meio-, macro- and megabenthos) of the island region was conducted at 18 stations during premonsoon season (May, 2014). Out of 18 sampled stations covered for assessing the benthic biodiversity, 8 stations (St. I to St. VIII) were having sandy substratum (Sandy stations) and 10 stations (St. 1 to St. 10) were from macroalgae growing on rocks (Algal stations). Samples for assessment for macrobenthos were collected following the standard methods of collection from intertidal regions. Considering the ecological status of the sessile megabenthic organisms, the occurrence of fauna was only recorded and photographed. The locations of baseline sampling in the island area have been presented in below figure.

Figure: Locations for Baseline study of Island Ecology



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(ENVIRONMENT TEAM, EGIS

A permanent loss of flora and fauna at this rocky outcrop and breakwater zone as a consequence of reclamation is envisaged. The main characteristic of the study site is that it harbours relatively lower diversity of megafauna and macroalgae. However, the study site is found to support few ecologically sensitive species such as Zoanthid (*Zoanthus sansibaricus*), three species of sponges (*Paraleucilla* sp., *Hallichondria panicea*; *Cliona kempi*) and two species of Scleractina corals (*Porites solida*; *Siderastrea savignyana*). Although these species are known to have very wider geographical distributional range in Indo- Pacific region, their distribution at the Rocky outcrop site, however appear to be very patchy. 6 genera belonging to 3 macroalgal groups have been recorded from the study site. Pheophyta was the dominant in terms of wet and dry weight (60% and 56%), followed by Rhodophyta (39% and 43%) whereas the Chlorophyta showed very low composition (1% and 0.43%),. Chlorophyta was less abundant in the study area compared to the other intertidal rocky areas of Maharashtra. This could be because the study area remains submerged for most of the time and gets fully exposed only during the neap tide. Careful planning and execution of various construction activities could minimize the impact on flora and fauna. An increase in turbidity due to enhanced levels of Suspended solids can negatively influence the photosynthesis and hence the primary productivity. However, the impact, if any would be local, temporary and reversible with the phytoplankton community structure quickly reestablishing once the construction is completed. A temporary and minor reduction in phytoplankton standing stock as a result of marginal increment in turbidity is unlikely to produce any negative impact on zooplankton standing stock. However, marginal localized change in the community structure and population alternations may occur confined to the project area. Such changes are temporary and negligible considering the good primary and secondary productivity potentials of the study region.

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Environmental Impacts of the proposed changes on the marine biota and fishery activities and other terms of reference as for the earlier EIA

The Environmental Impact Assessment Study for the proposed project has been carried out by CSIR - National Institute of Oceanography and CSIR - National Environmental Engineering Research Institute. Their findings are furnished below-

Environmental Impacts of the proposed changes on the marine biota

To establish baseline for biological components samples were collected from 13 locations (Stns. M1-M13) in the coastal marine waters off Mumbai by using a well-equipped fishing trawler. The spot of sampling at stations M1 to M13 in the subtidal region is shown in the figure below.

Figure: Map Showing the Locations for Biological Sampling

Construction activities in the intertidal and subtidal areas of proposed project site would influence the local biotic communities, particularly the macrobenthos. The macrobenthic data indicate that polychaete will be the major group which would be affected at the subtidal zone, whereas molluscs and crustaceans are the major intertidal groups that would be affected. As the sediment is moderately enriched in organic carbon (OC) its suspension (from patchy sediments) in the water column is unlikely to deplete dissolved oxygen (DO) in this dynamic well oxygenated coastal marine ecosystem. Therefore, the availability of DO for biotic

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processes would not be a constraint. The danger of biota getting exposed to pollutants released from sediment pore water when the bed gets disturbed is expected to be minimal.

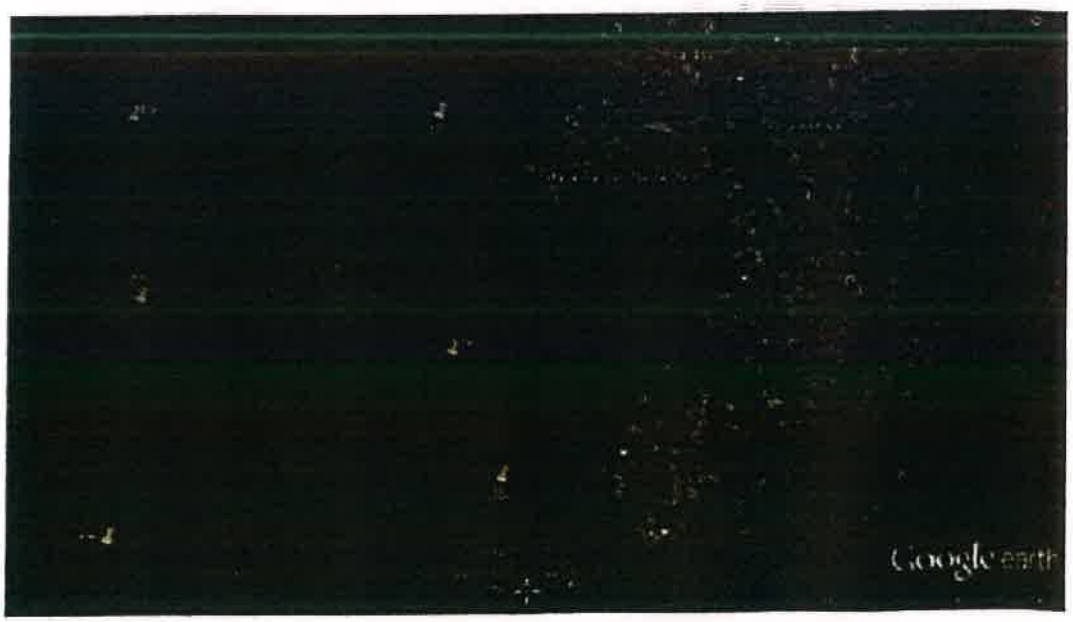
During operation stage, there will be instances that fish eggs, larvae, small fishes, plants and zooplankton pass through the screen due to sea water intake. These organisms are drawn in pumps and they may be subject to mechanical and chemical effects. Mechanical damage can arise from abrasions shear, impact and rapid change in pressure in passing through the pumps. Entrained organisms may also be effected by chemicals especially chlorine, added to intake waters. Even though the entrained organisms are not killed, young fishes that undergo physical damage may become prey to predators.

In the earlier proposal a marine aquarium was proposed which was likely to exhibit exotic flora and fauna for improving the aesthetics and attraction. Accidental escape of exotic species can cause bioinvasion and may adversely affect the genetic pool of the local fauna. In the changed plan the proposal for aquarium has been dropped. Hence, possibility of bio-invasion doesn't arise.

Environmental Impacts of the proposed changes on fishery activities

Fish and shellfish samples were collected with bottom trawl net in the fishing grounds of the project domain. Samples were collected from the three transects perpendicular to the coast. The locations of sampling are presented in below figure.

Figure: Experimental Trawling Transects Encompassing the Project Domain



The potential impact during construction phase on fishery productivity include, changes caused by habitat destruction, barriers to movement etc. Since the conditions would be restored once the construction and piling activity is completed. Furthermore, the pile structures, construction of jetty, intake and outfall pipelines can act as artificial reefs thus promoting the colonization of fish communities. Therefore, the

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Impact of construction on fishery productivity of the study region would be marginal. However, various construction activities need to be undertaken in consultation with the local fishermen community.

The proposed project site falls under the area prohibited for anchoring and trawling due to the existence of submarine cable in the nearby location. Due to the shallow depth and the rocky bottom, large scale mechanized fishing is not carried out. Fishing through country crafts, however are carried out in and around the project site i.e the Back Bay area. Large-scale hindrance to the fishing activities are not envisaged in operational stage due to the proposed establishment of the facility. However, the proposed routes of the tourist ferry boats from Nariman Point and the Gateway of India to the project site will be through the fishing areas and hence there would be interference with the local fishing activities.

No Objection Certificate (NOC) has already been taken for the proposed project from Commissioner of Fisheries (Govt. of Maharashtra) vide Letter No- 051401/34/2014 Dated. 18/07/2014.

There is no additional impact on Environment is envisaged due to the changes in project features for which Amendment in Environmental Clearance has been applied.

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Annexure IV

Addressal of ToR Issues

TOR compliance Report in accordance with submitted EIA report

Sl. No	TOR Points	EIA Section
1	The design shall not be an isolated one from the local architecture and motifs which shall be appropriately incorporated in the design to portray Indian heritage features in a place of heritage and tourist importance.	Section 1.4.1
2	The study should lay a strong focus on mitigation plan, as well as necessary features relating to safety and security of the Memorial and its visitors.	Over all mitigation plan is mentioned in the Section 5.2, 5.2.1, 5.2.2, 5.2.2.1, 5.2.3, 5.2.5,Table 5.2 & 5.4 Safety Security Plan Mention in the Section 5.3 Annexure D: details of fire extinguishers Annexure E :details of fire alarm system
3	Study on infrastructure facilities at shore, their development and related impacts, and mitigation to be carried out. Study of Sea transportation corridor route during construction and operation to be carried out.	Section 1.4.1 on infrastructure facilities. Section 4.5.1, 4.5.3, 4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.6 on impact assessment. Section 5.1 deals with mitigation Plan. Section 1.4.2 on sea route
4	Examine the carrying capacity vis-a-vis safe limit of number of people to be permitted on the Island at a time, keeping in view emergency evacuation and any unforeseen situation like antiterrorist operation, cyclone and other natural phenomenon.	Section 1.4, 4.6, 4.6.6, 5.2.2.1 &Table 5.4 on safe limit of number of people Section 5.3 on Safety Security Plan
5	Examine the impact due to floating population at the shore terminal, traffic management including parking.	Section 4.6,4.6.4 deals with visitors vehicle its movement and impact of traffic including parking
6	Examine emergency evacuation during natural calamity/man made with required infrastructure stating time required for complete evacuation including safe landing under bad weather conditions, jetty facility etc. Examine the EMP of any similar projects.	Section 5.3 on Safety and Security plan
7	Take advice from Bombay Natural History Society in respect of likely impacts due to any mechanical structures and lights on the birds, marine life.	Section 4.6.3 & 5.2.3 on effects of light on birds Section 4.6.3 & 5.2.4 deals with effect of wind firm on birds Advice from Bombay Natural History Society submitted.
8	Details of stone requirement for reclamation, quarry sources and transportation route may be provided.	Section 1.4.3 & Section 5.1 describes route of construction material

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Annexure IV

Sl. No	TOR Points	EIA Section
9	Examine details of land use according to Master Plan and land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. Distance from any archaeological site.	Section 2.3.11,2.3.12
10	Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/ villages and present status of such activities.	Section 2,2.1, 2.2.7.15, 2.3,2.3.11
11	Examine the likely impact on marine life, fishing vessel movement, during construction and operation phase. Submit the details of fishing activity and likely impacts on the fishing activity due to the project.	Section 2.2.7.13, 2.2.7.14, 2.2.7.15, 2.2.7.15 describes on marine life and biodiversity assessment. Impact assessment under section 4.5,4.5.5, 4.6.2 , 4.6.3, 4.6.4 Section 5.1, 5.2.2.1, 5.2.3, 5.2.4 deals with mitigation measures.
12	Examine road connectivity to the project site and impact on the existing traffic network due to the proposed project/activities. A detailed traffic and transportation study should be made. Study on transport of materials for construction should include source and availability.	Section 2.3.2,2.3.3 on transportation facilities
13	Submit a copy of layout superimposed on the HTL/LTL map demarcated by an authorized agency on 1:4000 scale along with the recommendation of the SCZMA.	CRZ map submitted
14	Details of dredging, rock dredging, likely impacts on marine life, mitigation measures proposed and disposal of dredge material.	Section 2.2.7.13, 2.3.11, Impact on construction phase under section 4.5.4, 4.6.4, Table 4.1. Section 5.1, 5.1.2, 5.1.3 Table 5.2. under mitigation measures
15	Examine the details of water requirement, source, waste generation, treatment, reuse of treated waste water, disposal. Prepare a water balance chart.	Figure 4.39 under section 4.6.2
16	Examine details of Solid waste generation treatment and its disposal.	Section 4.5.4,4.6.3, Section 5.1 & Table5.4
17	Details of desalination plant and the study for outfall and intake.	Section 1.4, 4.6.2, Table 5.4
18	Examine separately the details for construction and operation phase both for Environmental Management Plan and Environmental Monitoring Plan with cost and Technical parameters.	EMP given in the Section 5.13,table 5.2,section 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5 & section 5.4 and Table 5.4.

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Annexure IV

Sl. No	TOR Points	EIA Section
19	Submit details of a comprehensive Risk Assessment and Disaster Management Plan including emergency evacuation during natural and man-made disasters with due clearance from Mumbai Port Trust & Indian Navy as applicable as well as any other statutory authorities.	Section 5.3 on Risk Assessment and Disaster Management Plan. NOC from Mumbai Port Trust & NOC from Western Naval Command Submitted.
20	Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health.	Base line information under section 2.2, 2.3.9, 2.3.10, 2.3.11, 2.3.12, Expected impact under section 4.6, 4.6.2, 4.6.4, 4.6.5, 4.6.6
21	Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption.	Annexure F : Details of Power Consumption for Proposed Site
22	DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. Examine and submit details.	Not Available

egis India consulting engineers Pvt. Ltd.

(Environment Team, Egis)

Annexure - V
MoEF clearance for Shivaji Memorial

F.No.11-4/2015-IA.III
Government of India
Ministry of Environment, Forests & Climate Change
(IA.III Section)

Indira Paryavaran Bhawan
Jor Bag Road
New Delhi - 110 003

Dated: 23rd February, 2015

To
The Chief Engineer,
Mumbai (P.W.) Region,
4th Floor, Bandhakam Bhawan,
25, Murzaban Road, Fort,
Mumbai- 400 001, Maharashtra

Subject: **Proposed construction of Chhatrapati Shivaji Maharaj Memorial along wit equestrian statue of Chhatrapati Shivaji Maharaj in the Arabian Sea of th Coast of Mumbai, Maharashtra by M/s PWD, Mumbai – CRZ an Environmental Clearance - Reg.**

Sir,

This is with reference to the letter no. CE/Mum (P.W.)/664A dated 02/02/2015 seekin Environmental and CRZ Clearance on the above-mentioned project.

2. The Ministry of Environment, Forests & Climate Change has considered the application It is noted that the proposal is for grant of Environmental and CRZ Clearance for **Proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue o Chhatrapati Shivaji Maharaj in the Arabian Sea of the Coast of Mumbai, Maharashtra by M/s PWD, Mumbai.** The proposal was considered by the EAC in its meeting held on 9th February, 2015. The proponent has informed that:

i. The Government of Maharashtra intends to establish a memorial and statue o Chhatrapati Shivaji Maharaj, off Nariman Point, Mumbai. The memorial is aimed at no only providing a place for people to visit, but also create an internationally acclaime landmark of our country.
ii. The project was accorded TOR vide letter no. F.No.11-4/2015-IA-III dated 05.02.2015.
iii. The memorial shall be a 190 m high statue of the Chhatrapati Shivaji Maharaj.
iv. The identified location is an oval shaped Rocky out crop at latitude 18°55' 33.8" N an longitude 72° 47'25.0" E, of approximately 650 m x 325 m in size. The identifie location is 1.2 km southwest of Raj Bhavan, 3.6 km southwest of the Girgaon jetty an 2.6km west of Nariman point.
v. The statue will be built on rocky outcrop, which is exposed only during low tide an hence sheet pile walls are proposed to be erected along the boundary of the project site t prevent sliding and wall of 13 m height is proposed to protect the area from sea wate There should not be any impact on marine life at the time of driving sheet piles and als boundary wall should be designed for Tsunami/ Storm Surge.
vi. The proposed project area is under the jurisdiction of Port of Mumbai.
vii Following Clearances/Permissions have already been obtained:

- Terms of Reference (TOR) from MOEFCC.
- Government Resolution passed for the project
- NOC from Mumbai Port Trust
- NOC from Western Naval Command
- NOC from Fisheries Dept.
- NOC from BNHS

viii. Following Studies have been carried out:

- Geotechnical Study Conducted and report prepared by Indian Institute of Technology (IIT, Mumbai)
- EIA and Wave Behavior Study and Report made by National Environmental Engineering Research Institute (NEERI, Nagpur) and National Institute of Oceanography (NIO, Goa).
- Environmental Management Planning, Disaster and Safety Management Plan prepared by Fine Envirotech Engineers, Mumbai.

ix. The areas assigned for different infrastructure facilities as follows:

Sr. no.	Description	Area (sq.m.)
1	Total area cover (Rock surface area)	15.96 ha
2	Area of pedestal at ground floor	16237.00
3	Area of pedestal at first floor	10024.00
4	Area of pedestal at second floor	5302.00
5	Area of residences for staff security	6000.00
6	Roads and platforms	28410.09
7	STP and WTP	409.00
8	Public toilets	300.00
9	Helipad	790.00
10	Jetty (2 main, 1 jetty for VIP and 1 jetty for service)	100 x 12

x. The central core of the pedestal has to support the statue of Chhatrapati Shivaji Maharaj, which is about 160 m in height from the base.

xi. It consists of three layer pedestal of concrete (M60 grade) with stone cladding of natural stone (Granite). The natural stone granite is suggested by the Department of Earth Science of IIT Bombay, Mumbai.

xii. The height of pedestal is 32.5 m. The first level of pedestal is about 140 m x 140 m x 10 m in dimension; second level of pedestal is about 110 m x 110 m x 10 m; the dimension of third level of pedestal is 80 m x 80 m x 10 m.

xiii. The material for pedestal is proposed as M60 concrete with optimum use of silica fume or fly ash which in turn solves the problem of dumping of fly ash and fume on the fertile land, and provides more strength and durability to the structure.

xiv First sheet pile walls will be erected along the boundary of the project site. Sufficient number of piles will be driven in the rocky outcrop to prevent sliding. The construction

of sheet piles is planned during the non-monsoon period and is expected to be complete in 6 months.

xv. Ready mix concrete of M60 grade will be pumped from the Raj Bhavan side through 30 mm diameter HDPE pipeline with help of pump of capacity 4000 Hp.

xvi. The steel and 40,000 m2 natural granite stones will be transported from Mumbai Port t the project site through barges. The armour layer of breakwater will be made of tetrapo to withstand the expected design wave height. A temporary jetty will be constructed fo unloading the materials and machinery transported through the barge.

xvii. The berthing jetty will be on concrete piles. The fortified wall will be made of concret structure.

xviii. The following issues w.r.t. tourists were collected and analyzed:

- A survey was carried out at the existing tourist location of Gateway of India t work out potential tourists visiting the proposed Memorial.
- Three days tourist count was taken with the help of well trained enumerators data collected with break up of International tourists and Domestic tourists, Loca (MMR Region) and Outside MMR Region.
- It is assumed that the tourists presently visiting Gateway of India would be th potential tourists for the proposed Memorial.
- It is assumed that the tourists from Mumbai, repeatedly visiting Gateway of Indi (at present), may not visit Memorial every time.
- Number of tourists visiting Elephanta Caves at present, could be considered a potential visitors for proposed Memorial.
- According to survey carried out for 3 days for a peak season, the number o tourists on week- days are nearly 50% of number of tourist on Sundays an Holidays. Thus tourists count for Tuesday, Wednesday, Thursday and Friday ar considered as 50% of tourists on Sunday.
- According to the past data collected from Maharashtra Tourism Developmen Corporation (MTDC) the Seasonal variation is nearly 8% less than Annua Average Daily Tourist (AADT) from the month of February to September an 9.5 % higher than AADT from the month of October to December. Thus seasonal variation of 8.64% has been considered for arriving at AADT.
- According to MTDC's past data, 25% of tourists from Gate Way of India visi Elephanta Caves, who can be considered as potential tourists visiting th proposed Memorial.
- Future tourist growth is considered as 10% per year based on the past trends.

xix. Annual average daily tourists at proposed Memorial would be 10,000.

xx. Total parking for 1343 nos. of cars, 216 nos. of taxi, 2nos. of mini buses, one tourist bu and one LCV are proposed.

xxi. MCGM has proposed dedicated multi level parking facility at Kala Ghoda and at S.F Mukharjee Chowk.

xxii. Following issues have taken into account w.r.t. Traffic Dispersal:

- Free shuttle service (Mini bus) facilities are proposed for dispersal of touris from; Chhatrapati Shivaji Terminal (CST) to take off points, Church Gate to tak off points, Kala Ghoda to take off points.
- This will avoid direct entry of cars to the take off points and will be helpful t existing parking also.

xxiii. Future Impact of Metro services were also analysed which are as follows:

- Metro services are expected to operate in next 5 years.
- It is expected that local tourist will shift their mode of transport from cars to metros. However, growth of 10% is considered to prepare a master plan for traffic dispersal system.
- This will help partly to reduce the parking requirements in future

xxiv. Disaster Management Plan (DMP) was also analysed which is as follows:

- Considering the large volume of tourists, disaster management plans are prepared for individual parking lots as well as for Memorial area
- This includes fire safety equipments, public address system, signage's showing evacuation route, safety information, emergency contact numbers, mobile cardiac van, internal security arrangements, local police chowky, etc.
- Linking this DMP with DMP of State unit

xxv. Evacuation Plans were also analysed which are as follows:

- In case of disaster on Island following are the alternatives for evacuation of tourists:
  1. Air lifting by Helicopter service
  2. Deployment of Navy Boats
  3. Fire Safety Equipment

i. Fire Water Storage tank: Water storage tanks would be installed near each of the four corners of the memorial. Pipelines would be connected from these tanks to every nook and corner of the Memorial so that necessary actions could be taken as soon as possible. These tanks would be automatically replenished with water from the sea.

ii. Fire Alarm System: Fire Alarm system consisting of smoke detectors, heat detectors shall be provided in the Corridors, and every part of the buildings. Manual call points hooter, public address system, main and repeater panels shall be provided as per the rules and regulations.

xxvi. CRZ demarcation has been carried out by NIO, Goa and the project site falls under CRZ-IV, Jetty for the transportation of the passengers will be in CRZ-1B. No mangroves are present near the site.

xxvii. There shall be zero discharge of waste water and garbage into the sea at the memorial site.

xxviii. There will be no dredging at the site.

xxix. The cost of the project is Rs.1900 Crores.

xxx. **Approvals:** The Maharashtra Coastal Zone Management Authority (MCZMA) has recommended the proposal vide letter no. CRZ2014/CR 25/TC 4 dated 23.01.2014.

xxxi. **Wildlife issues:** There are no eco-sensitive area within 10 km radius of the site.

xxxii. **Forest land:** No Forest land involved in the project.

xxxiii. There is no court case against the project.

xxxiv. **Public Hearing:** The State Govt. has requested for exemption of public hearing as the construction of memorial is for public at large and not a commercial activity, The EAC recommended to exempt the Public Hearing based on the submissions of the Govt. of Maharashtra.

3. The proposal was considered by the Expert Appraisal Committee (EAC) and recommended in its meeting held on 9th February, 2015 for granting Environmental and CRZ Clearance. The Ministry of Environment, Forests & Climate Change hereby accords

Environmental and CRZ Clearance for the above-mentioned Proposed construction o Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapat Shivaji Maharaj in the Arabian Sea of the Coast of Mumbai, Maharashtra by M/s PWD Mumbai under the provisions of the Environment Impact Assessment Notification, 2006 an CRZ Notification, 2011 and amendments thereto and Circulars issued thereon and subject to th compliance of the following specific conditions, in addition to the general conditions mentione below:

A. **SPECIFIC CONDITIONS:**

(i) "Consent for Establishment" shall be obtained from State Pollution Control Board unde Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Contro of Pollution) Act, 1974.

(ii) All the construction shall be in accordance with CRZ Notification, 2011 and it amendments thereto.

(iii) All the recommendations/conditions of the Maharashtra Coastal Zone Managemen Authority (MCZMA) vide letter no. CRZ2014/CR 25/TC 4 dated 23.01.2014, shall b strictly complied with.

(iv) The evacuation management system shall be inter-alia based on maximum holdin capacity of the island, handling capacity of jetty and infrastructure and the maximun number of tourist who are proposed to be at the Memorial site at any point of time.

(v) The maximum number of visitors to the memorial should be based on maximum carryin capacity as well as evacuation capacity on any unforeseen situation, after accounting fo the vessels who may be deployed in the transit of passengers/ tourists who are in th process of coming to the memorial or returning from it. Evacuation of people shall b devised in a manner taking into account the availability of boats, discounting the boat deployed in transit of tourist to and from the site, meaning thereby emergency evacuatio by 3000 tourists/visitors from the memorial shall be a standalone facility.

(vi) There shall be no dredging as informed by the Project Proponent.

(vii) Transport of construction material to Raj Bhawan site: Trucks chosen for transpor should have low noise and low emissions and comply with the norms. However, bes maintained trucks would have noise levels between 85 to 95 dBA per truck. Alternat route of transportation should also be explored. Transportation by sea route may also b considered.

(viii) Pumping ready mix concrete from Raj Bhawan: Noise barriers are required to b installed to reduce the noise level due to pump operation, within the prescribed limits.

(ix) Boats used for passenger transport shall use cleaner fuel such as CNG.

(x) The parking facility shall be based on the peak time parking. Multi level parking shall b created so as to reduce the parking and traffic congestion at Gateway of India an Nariman Point.

(xi) Evacuation plan shall have stand alone facilities including dedicated earmarke boats/barge, helicopters, medical relief agencies. The plan shall have details of divisio

of labor among all stakeholders connected with the evacuation plan, and periodic safety drills should be undertaken.

(xii) NOC from the Western Naval Command be obtained for evacuation/emergencies as well as for the final height of the proposed memorial structure.

(xiii) PP shall make arrangements for collection and disposal of solid waste generated at boarding points and also at the Memorial. Composting of bio-degradable waste shall be carried out and non-degradable waste shall be transported to land for further disposal and treatment in accordance with the regulations.

(xiv) The RO rejects shall be disposed at a point where sufficient dilution is available.

(xv) The wastewater generated at the Memorial shall be treated and recycled for gardening/flushing etc. and in no case it shall be discharged into the sea. There shall be zero discharge of waste from the Memorial project into the sea as indicated by the Project Proponent.

(xvi) Lights which are least attractive to the birds, like red and blue light, can be considered.

(xvii) Areas would be made available on higher floors for the assembly of large crowds, vertical transfers (airway) will be made available in flood/storm/Tsunami situations.

(xviii) Clearances from Fire Department shall be obtained for the project, Who shall regularly inspect the devices.

(xix) Adequate number of free boats, helicopters shall be in standby or immediate availability mode so as to evacuate the visitors from the memorial on any unforeseen situation.

(xx) Detailed on-site and off-site Emergency Management Plan shall be put in place under the supervision of District Collector. Periodical review and mock drill shall be conducted under the supervision of District Collector.

(xxi) At least a ten bedded hospital shall be established including three beds for VIPs and other for general tourists.

(xxii) There should not be any impact on marine life at the time of driving sheet piles and also boundary wall should be designed for Tsunami/ Storm Surge.

(xxiii) The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.

(xxiv) Corporate Environment Responsibility:

a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.
b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation/violation of the environmental or forest norms/conditions.

c) The hierarchical system or Administrative Order of the company to deal wit environmental issues and for ensuring compliance with the environmental clearanc conditions shall be furnished.

d) To have proper checks and balances, the company shall have a well laid dow system of reporting of non-compliances/ violations of environmental norms to th Board of Directors of the company and/or shareholders or stakeholders at large

B. GENERAL CONDITIONS:

(i) Appropriate measures must be taken while undertaking digging activities to avoi any likely degradation of water quality.

(ii) Full support shall be extended to the officers of this Ministry/ Regional Office a Nagpur by the project proponent during inspection of the project for monitorin purposes by furnishing full details and action plan including action taken report in respect of mitigation measures and other environmental protection activities.

(iii) A six-Monthly monitoring report shall need to be submitted by the projec proponents to the Regional Office of this Ministry at Nagpur regarding th implementation of the stipulated conditions.

(iv) Ministry of Environment, Forests & Climate Change or any other competen authority may stipulate any additional conditions or modify the existing ones, i necessary in the interest of environment and the same shall be complied with.

(v) The Ministry reserves the right to revoke this clearance if any of the condition stipulated are not complied with the satisfaction of the Ministry.

(vi) In the event of a change in project profile or change in the implementatio agency, a fresh reference shall be made to the Ministry of Environment, Forest & Climate Change.

(vii) The project proponents shall inform the Regional Office as well as the Ministry the date of financial closure and final approval of the project by the concerne authorities and the date of start of land development work.

(viii) A copy of the clearance letter shall be marked to concerned Panchayat/loca NGO, if any, from whom any suggestion/ representation has been made receive while processing the proposal.

(ix) Full support should be extended to the officers of this Ministry's Regional Offic at Nagpur and the offices of the Central and State Pollution Control Board by th project proponents during their inspection for monitoring purposes, by furnishin full details and action plans including the action taken reports in respect o mitigative measures and other environmental protection activities.

(x) The funds earmarked for environmental protection measures shall be kept i separate account and shall not be diverted for other purpose. Year-wis expenditure shall be reported to this Ministry and its concerned Regional Office.

4. These stipulations would be enforced among others under the provisions of Wate (Prevention and Control of Pollution) Act 1974, the Air (Prevention and Control of Pollution

Act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 1994 including the amendments and Rules made thereafter.

5. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.

6. The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental and CRZ Clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen on the website of the Ministry of Environment, Forests & Climate Change at http://www.envfor.nic.in. The advertisement should be made within Seven days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Nagpur.

7. This Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.

8. Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.

9. Any appeal against this clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

10. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad/Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.

11. The proponent shall upload the status of compliance of the stipulated Clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB.

12. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of Clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.

Yours faithfully,

(Dr. Manoranjan Hota)
Director

Copy to:

1. The Secretary, Department of Environment, Govt. of Maharashtra, Mantralaya, Mumbai – 400 032

2. The Chairman, CPCB, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar Delhi - 32.
3. The Chairman, Maharashtra Pollution Control Board, Kalpataru Points, 3rd & 4th floor, Opp Cine Planet, Sion Circle, Sion (E), Mumbai - 400 022.
4. The Chief Conservator of Forests, Ministry of Environment and Forests, Regional Office Nagpur.
5. Guard File.
6. Monitoring Cell.

(Dr. Manoranjan Hota
Directo

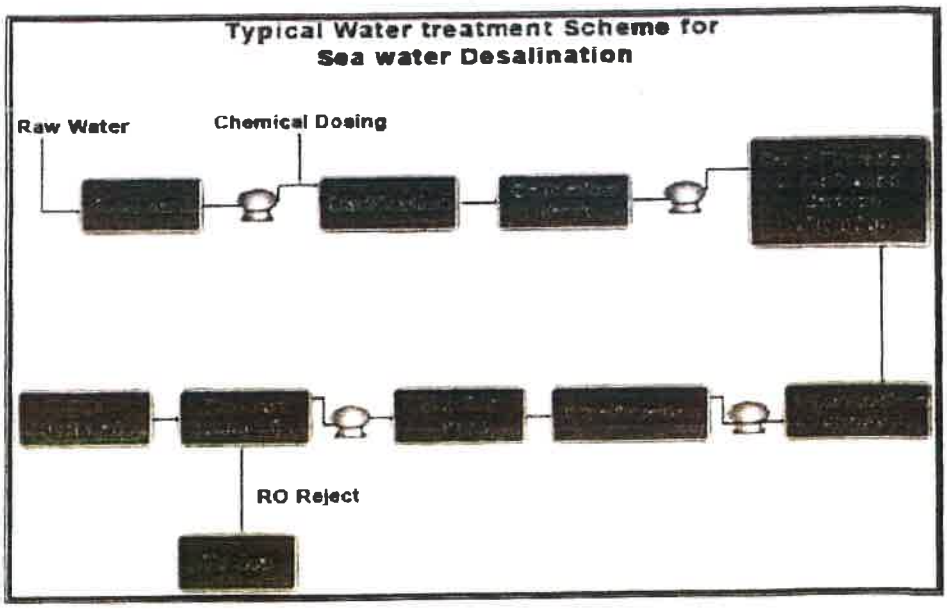
Annexure VI

Disposal of effluent from desalination plant

Blending RO concentrate with secondary treated effluent from a waste water treatment plant can be practiced to mitigate the impact of the high total dissolved solids (TDS) (or other solute) concentrate using the blending capacity of a lower-TDS stream. This combined stream can then be further discharged in accordance with existing permits. Implementation of this technique for reject water disposal is simple because no new equipment's are needed.

Intake sea water shall be taken from one side and discharge out shall towards opposite site of the Island.

RO MODULES (Desalination Process)	
Number of Skids	2 Nos. (1W+S)
Feed Flow Rate	18.25 m^3/hr.
Permeate Flow Rate	7.30 m^3/hr.
Reject Flow Rate	10.95 m^3/hr.



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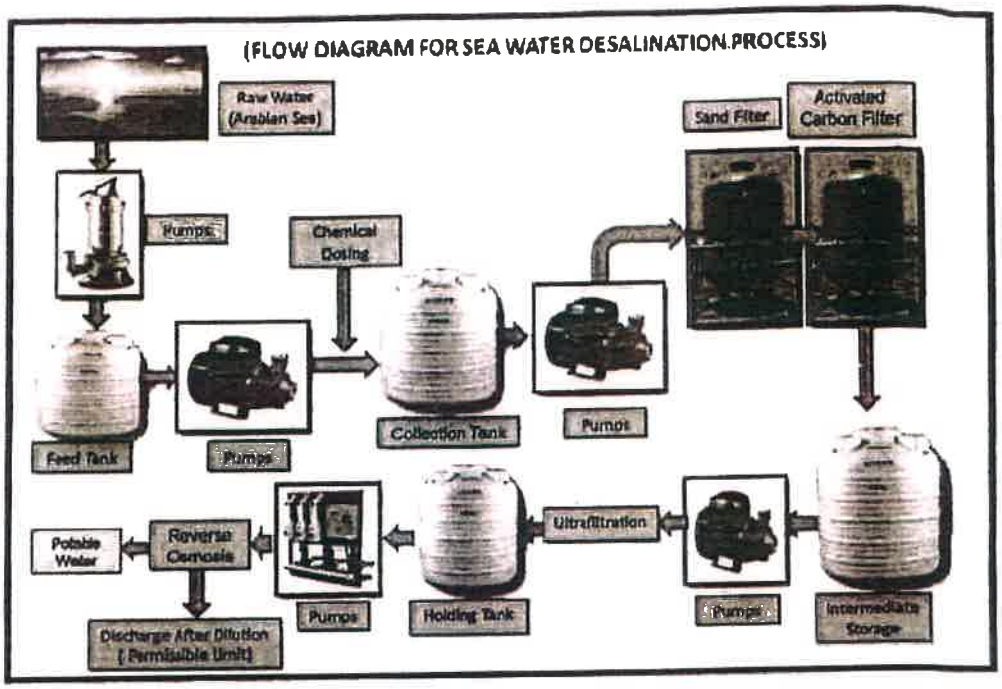
(Environment Team, egis)

Annexure VI



egis India consulting engineers Pvt. Ltd.

(Environmental Team, Egis)

JOB NO. - CSMM/2017-18	DATE- 19/03/2018
DWG. NO.- 600/TD/AR/COR/001	
PROJECT- CHHATRAPATI SHIVAJI MAHARAJ MEMORIAL, MUMBAI	
DRAWING TITLE- SITE PLAN	
N	SCALE- 1:1200

NOTE:

1. THE DRAWINGS ARE PREPARED SPECIFICALLY FOR THE DPR OF THE EPC DESIGN AND BUILD PROJECT AND ARE INDICATIVE IN NATURE.
2. THE EMPLOYER, WITH ITS AGENTS AND REPRESENTATIVES DISCLAIMS ANY IMPLIED WARRANTY OR ANY ACCURACY, COMPLETENESS, CONSTRUCTABILITY, FITNESS FOR PURPOSE AND ADEQUACY OF THE DPR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING THE PROJECT AND FOR PRODUCING THE CONTRACTOR'S DOCUMENTS, INCLUDING BUT NOT LIMITED TO, DRAWINGS AND SPECIFICATIONS THAT ARE FREE FROM ERRORS AND OMISSIONS AND THAT ARE ADEQUATE FOR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETENESS, ACCURACY AND CONSTRUCTABILITY OF ALL THE CONTRACT DOCUMENTS, INCLUDING, WITHOUT LIMITATION, THE DRAWINGS, SPECIFICATIONS AND MATERIAL LISTS, IN FURTHER COMPLIANCE WITH ALL THE DPR AND OR WITH THE ENGINEERING STANDARDS, CODES, PRACTICES AND TECHNICAL OR OTHER SPECIFICATIONS, AS PRESCRIBED UNDER THE CONTRACT AND/OR THE APPLICABLE LAWS AND PERMITTED AGENCIES AND AUTHORITIES REQUIREMENTS.

MARK	DATE	DESCRIPTION

ARCHITECTS-

DESIGN ASSOCIATES INC.
ARCHITECTURE

A - 163, SECTOR -136,
NOIDA, U.P. 201301
Ph.: 0120 - 2428600-30

CONSULTANTS-

egis

EGIS GROUP
EGIS TOWER, PLOT NO. - 66, SECTOR - 32,
GURGAON, HARYANA 122001
P.h.: 0124 - 4249200

1.1 Project Description

It is proposed to develop the Island for erecting the statue of Chattrapati Shivaji Maharaj on an oval shaped rock out crop situated at the intersection of the Back Bay and the Arabian Sea. The outcrop located at 18˚55'33''N and 72˚47'25''E is usually submerged at high tide and emerges at low tide. The proposed location is at 1.2 km southwest of Raj Bhavan, 3.6 km southwest of Girgaon jetty and 2.6km west of Nariman point. The location of the project is presented in **Figure 1.1**.

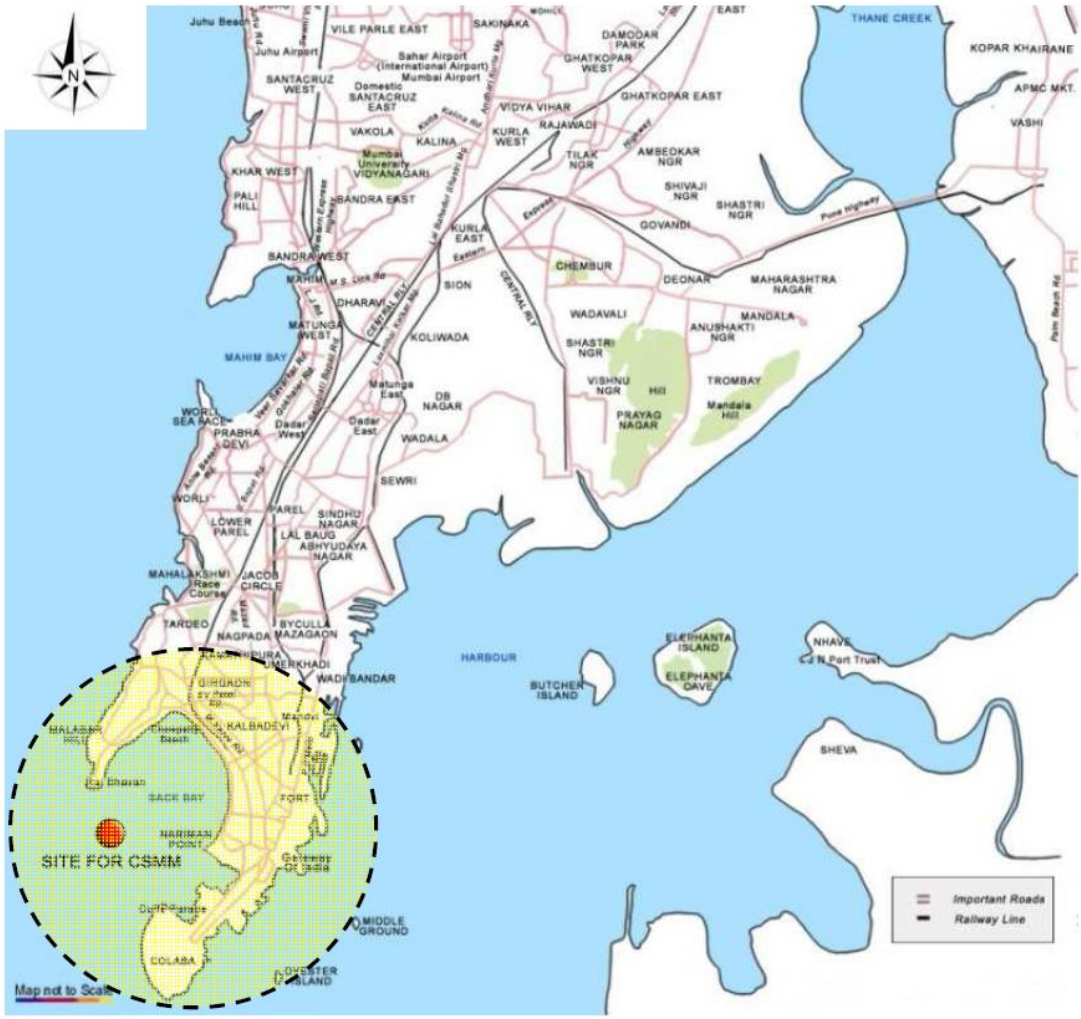


Figure 1.3: Location of the site with respect to Mumbai City

The following stages shall be involved for development of island and marine works:

- A Rock bund will be constructed around the proposed reclamation area upto 5 m above CD.
- Island will be reclaimed by filling material soil/sand and compaction will be carried out.
- A sea wall using laterite blocks will be constructed above rock bund.
- North Break water prepared for island will be merged with approach jetty which is being constructed for visitor access.
- Revetment around the island between South and north Breakwater is prepared.

- North and South Breakwater is prepared which will ensure wave tranquility at berthing locations.

It is proposed to erect a 210 m high memorial to Chhatrapati Shivaji Maharaj on a rocky outcrop off the Marine Drive, which can be viewed from the central point of the Marine Drive Back Bay area. It is proposed to fortify the rocky outcrop with Laterite rock wall. It is expected that about 10000 persons to visit the memorial every day. The implementation of the said project shall bring socio-cultural awareness and well planned facilities for recreation, education and ideas interchange. It will also place Mumbai as a city with unique attraction in the World for people to visit.

The objectives of the proposed developmental activity are :

- To provide a memorial to the most revered king of Maratha Empire in India, with a view to give national and international tourism a unique attraction.
- Development of the memorial in an area of about 6.8 Ha with the following facilities.
  - Art museum, exhibiting various aspects of Shivaji Maharaja's kingdom era records
  - Helipad including all facilities as required.
  - Exhibition gallery.
  - Landscaping and open space for visitors.
  - Viewing Galleries
  - Common facilities such as cafeteria, lavatories, retail spaces and offices.
  - Security installations for safety and disaster management system
  - Wastewater treatment (STP; Capacity 2 X 130KLD = 260 KLD), solid waste management facility and environmental safeguards facilities,
  - Berthing jetty for embarkation and disembarkation of tourists,
  - 10 bedded medical facility and 30 bedded Staff Quarter

Diagram Showing the Layout of Various Facilities and site plan of the Project is presented in **Figure No1.2**

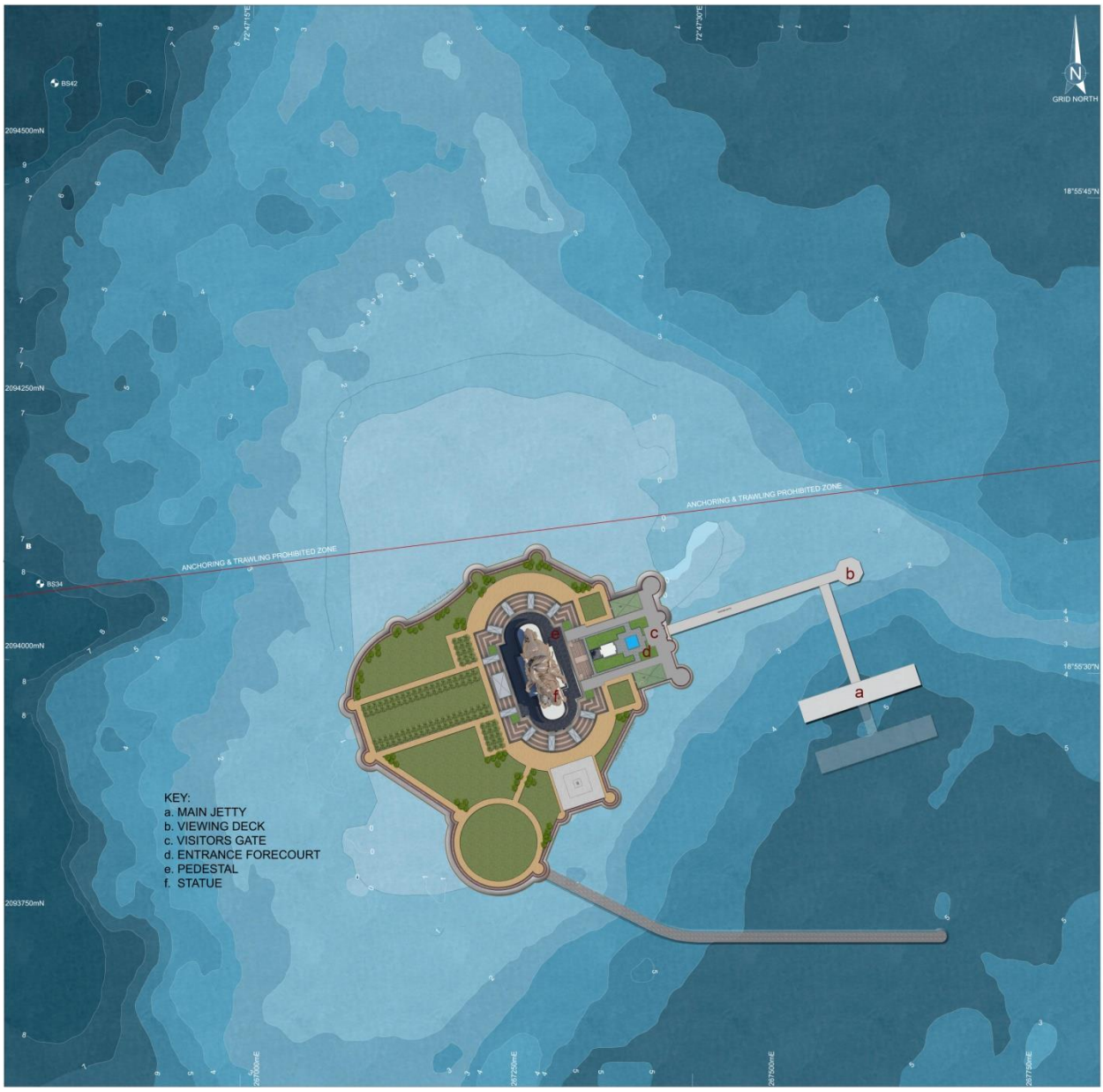


Figure 1.3: Site Plan of the Proposed Project

1.1.1 Details of the Statue and the Associated Structures

The monument is planned as an equestrian sculpture of Chhatrapati Shivaji Maharaj placed on a pedestal, the total height of which shall be 210 meters. The height of the monument is measured from Mean Sea Level and includes the fort like base 7 m high, 121.2 m high equestrian statue of Chhatrapati Shivaji Maharaj placed on a two tiered pedestal with a height of 81.8 m height. The pedestal would accommodate a series of elevators to approach the base of the statue and also house a museum and a virtual reality based immersive experience for visitors. The orientation of the sculpture facing South–East is determined by the fact that when viewed from Marine Drive the raised sword arm will not obstruct the face of Chhatrapati Shivaji Maharaj. The view of the statute is presented in **Figure No.1.4**

Figure 1.4: View of Proposed Shivaji Statue

The facilities proposed at the project site are listed below.

A) <u>Sculpture And Pedestal Structure:</u>

The monument is planned as an equestrian sculpture of Chhatrapati Shivaji Maharaj placed on an pedestal. The pedestal would accommodate a series of elevators to approach the base of the statue and also house a museum and a virtual reality based immersive experience for visitors. The pedestal has been designed as a two tiered structure stepping back to create a tiered effect.

The high pedestal has a large ground coverage and volume, which, when spread over a number of floor plates can accommodate various functions including Access and Exit lobbies, Exhibition

Space-Museum, Retail, Restaurants, Service floors and a Viewing Deck.

Sculpture: The client (PWD, Maharashtra) has conveyed that the design life of the monumental equestrian sculpture of Chhatrapati Shivaji Maharaj will be 100 years.

With respect to the main structural support core, a core is proposed which will rise through the pedestal through the body of the mount and reducing continue up through the shoulders into the head. The statue is to be supported on a central core that runs through the entire height of the statue and the statue itself shall be a bronze shell that shall be supported on a srtuctural steel lattice system. A secondary core within this framework will take visitors up to the horses head .It has been determined that an appropriate Corrosion Resistant Bronze alloy be considered for the skin of the sculpture. Nickel - Aluminum Bronze of a suitable composition may be considered based on its flow-ability and other characteristics during casting and welding processes. The armature of the sculpture would be constructed using steel of an appropriate grade. It is proposed that sand casting be adopted for a majority of the elements with detailed elements cast using a lost wax process. Cast elements are to be assembled into larger panels mounted onto a steel sub-frame; these are to be attached to the steel space-frame using adjustable struts. Individual panels are to be lifted into position using tower-cranes, hoists etc. as required

Cross section of the statue showing various decks presented in **Figure 1.5**.

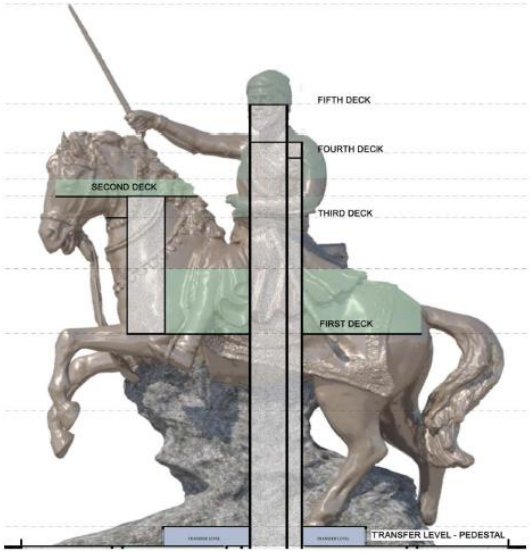


Figure 1.5: Cross Section of the statue showcasing the various decks

Pedestal: The client (PWD, Maharashtra) has conveyed that the design life of the pedestal will be max. 100 years. The pedestal is designed as an RCC structure. The required design-life is achievable using higher grades of concrete, admixtures to minimize occurrence of voids in concrete, application of protective coatings on reinforcement, using cathodic protection, application of sealants on finished concrete surfaces proper maintenance & upkeep of the structure. The high pedestal has a large ground coverage and volume, which, when spread over a number of floor plates can accommodate various functions including Access and Exit lobbies, Exhibition Space- Museum, Retail, Restaurants, Service floors and a Viewing Deck. Schematic cross section of the pedestal showing the major functions on each floor is presented in **Figure 1.6.**

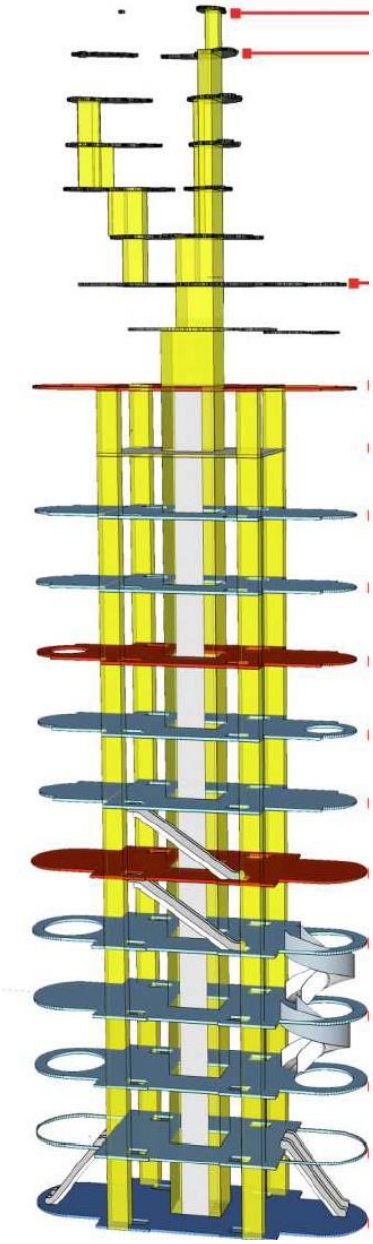


Figure 1.6: Schematic cross section of the pedestal showing the major functions on each floor

Helipad

The location of this facility is an area on the southwest end of the island and will provide VIP and emergency access. It offers a flight path well clear of the monument, is oriented to best utilize prevailing winds and its low parapet allows for safe helicopter landings

B) Entrance and Exit Lobbies

Twin level Entrance and Exit lobbies have been designed to segregate the entry and exit of visitor with adequate holding areas provided in the entry zone. The Entry level is at the ground floor of the pedestal with Exits lobbies at the first floor level. These are organized in a manner to avoid any cross movement. A 10 bedded medical Facility is provided within.

C) Museum and Multi-Media Galleries

The Museum features a series of galleries spread over 4 levels of the pedestal with 2 additional floors proposed in Phase 2. These are entered at the top most gallery level with the exits integrated into the overall exit system. Beginning with a large entrance foyer and an introductory Audio visual exhibit showcasing the life and times of Chhatrapati Shivaji Maharaj, visitors will proceed downward through a series of different spaces and volumes which provide the exhibit designer with a series of opportunities to create unique displays. The types of gallery spaces provided include the two circular galleries at either apsidal end followed by two square galleries on either side of the central core providing the largest spaces.

D) Service Floors:

Service floors have been provided at the fifth and eighth (proposed in Phase 2) floor of the pedestal. The sixth floor is the transition floor where the pedestal steps back to a narrower profile. The service floor caters to the following:

- Transferring of vertical services horizontally to different locations as the building footprint changes
- Accommodating various service equipment including HVAC, fire suppression systems, electrical panels, audio visual and display, storage, archival area for the museums.
- The service floor at the sixth floor level will accommodate administration offices and a security control room for the complex.

E) Restaurant, Food Courts and Viewing Gallery:

The ninth floor accommodates a food court where visitors can dine while enjoying views of Backbay area and the Arabian Sea. The floor plate has been specifically designed to accommodate up to a 700 visitors and caters for a self-service multi cuisine cafeteria.

The tenth level of the pedestal accommodates a glazed viewing gallery. The floor plate, about 75

mtr. above MSL, enjoys distant views of the Arabian Sea and panoramic views of the city skyline particularly the Backbay area. The space has a holding capacity of about 1000 people.

F) Landscape:

The proposed landscape scheme works with the innate geometry created on the site whereby the irregular external profile of the fort is transformed into a visually symmetrical space within. The focus of the scheme is the central Monument and all the elements of the landscape are designed around it. Landscape is an integral component of this project and it blends seamlessly into the overall design scheme. Landscaped areas constitute about 35% of the total island area. Landscape consists of Pathways, Rear Court, Entrance Forecourt, Rear Court, North Lawn, South Lawn, Tree plantation Zones

G) Sewage Treatment Plant:

The sewage treatment plant (mbbr technology) has been designed with a capacity to handle 260 m3/day (2- Stream) of soil waste including Kitchen waste. Entire sewage treatment plant is underground & consists of Equalization and collection sump with horizontal centrifugal pumps, bioreactors tanks, Tube setting tank, sludge holding tank and Treated Effluent tank, filter feed pumps, drainage pump for plant room drainage, Dual Media filter, activated carbon filter, S.S/MS/GI/HDPE pipe and fitting, valves and associated electrical works. In order to conserve water, Sewage Treatment Plant has been designed to ensure that treated effluent (water) characteristics are well below the permissible limits of local/national pollution control norms. It is also proposed to design a sewage treatment plant in such a way that effluent can be recycled for flushing, HVAC Cooling Tower.

H) Security Staff Barracks:

The ist floor above the Main entrance gateway attached to the forecourt housesa 30 bedded barrack for security staff in a series of 6 bedded dormitories. Amenities including toilets, offices and mess hall are also provided.

I) Desalination Plant, Rain Water Harvesting, and RO:

Desalination Plant of 160 KLD (one running & one stand-by) and RO Plant of 22,250 LPD capacity have been proposed to cater the water requirement.

J) Jetty:

1 Public and 1 a secondary jetty attached to the South Break water have been proposed. The proposed public jetty consists of an approach (combined with the north breakwater) and terminating ai an octagonal viewing deck. An approach trestle at right angle connects to a jetty head platform on a RCC structure of size 120m X 25m supported on bored cast-in-situ piles. Passengers from the vessels will disembark at jetty head having berthing facility of 4 vessels and future expansion if required. The platform at jetty head has a 3-stored building with all the required facilities for arrival, departure and waiting of passengers.

To meet service requirements and any emergency situations, a secondary jetty is proposed on the South Breakwater. The jetty shall have provisions for mooring and berthing of ships.

K) Revetment cum Breakwater

There is a need of Revetment cum Breakwater around the island to provide protection from the waves so as to ensure a safe and calm basin for the terminal facility. The revetment cum breakwater shall facilitate safe navigation conditions into and around the jetty providing a haven for passenger vessels during extreme ocean conditions thereby creating an acceptable wave climate for the design of marine infrastructure. Two breakwaters shall be constructed within 0 to 4-m CD seabed contour, and shall comply with the specifications and requirements. There are two breakwater proposed. The armour layer of Breakwater was shall be Rock with Accropode or Accropode II.

L) Toilets:

Adequate toilets facilities have been proposed at suitable locations. All the toilets will be ventilated at 15 ACPH (Air Changer Per hours). The typical toilets on the floors shall be ventilated through common exhaust air duct. The toilets for non-typical floor shall be treated with individual fan section units/ Inline fans.

M) Fire Exits

Apart from the staircases located in the central core four additional Fire Escape have been provided at the corners of the pedestal. These allow the building to meet all the fire escape requirements of norms laid down as per NBC. Refuge areas are provided on 6th floor and Terrace floor of the Pedestal. Fire detection, compartmentation, pressurization, wet-risers, sprinkling, smoke extraction, ventilation and fresh air supply has all been considered while planning the spaces within the pedestal.

N) Landside Facilities

Locations for the landside facilities including parking, ticketing, queing, jetty terminal, and associated facilities have been identified. These are to be developed by various executing agencies as mentioned in the table below.

Table 1.1 : Proposed Landside Facilities

S. No.	Location	Area	Proposed Capacity Persons/day	Executing Agency
1	Sagar Sangam	Navi Mumbai	8000	CIDCO
2	Radio Club	Gateway of India	2000	MMB/MPT

1.1.2 Construction Material

Requirement of various construction material along with approximate quantity has been presented below.

- Cement 105000 MT
- Sand 75000 M^3
- Stone chips 150000 M^3
- Steel reinforcement 33000 MT
- Quarry run stone 80,000 MT
- Filter layer stone 7000 M^3
- Armour layer stone 2,22,000 MT
- Sand for reclamation 1000000 M^3

Steel, granite, laterite, sand will be transported from Dighi Port by barrages. Ready mix concrete mounted barges will be used to transport M60 grade concrete from Port to the Island. A majority of the construction proposed shall be pre-fabricated offsite with minimum in-situ construction.

1.1.3 Project Cost

The cost of the project is Rs. 2500 crores + GST for Phase I .

1.1.4 Future Expansion

Phase II will be taken up in conjunction with adequate landside infrastructure to support an enhanced daily visitor footfall of an added 15,000 people.

1.1.5 Area for Various facilities

The breakup for area covering various facilities of Phase I and Phase II of the project has been furnished in below table.

Table 1.2 : Break-up Area for Various Facilities for Phase I &II

S. No.	Description	Area (Sqm)		
		Phase-I	Phase-II	Total
1	**Site Area**	**68347**	**-**	**68347**
2	Ground Coverage	9003	5000	14003
3	Built Up Area Of Ancillary Buildings	4378	5250	9628
4	Built Up Area Of Pedestal	34763	7431	42194
5	**Total Built-up Area**	**46312**	**12681**	**58993**
6	Green area	24142	24142	24142
7	Hard scaped area	14597	-	14597
8	Visitors jetty (1 no.)+	9000	-	9000

Comparison by depicting the Changes between the Original and Revised Proposal and Identification of Additional Impact on Environment

The details of earlier proposal and revised proposal are given in the following Table along with envisaged additional impact on Environment:

S. No.	EC Clause No.	Earlier Proposal	Revised Proposal	Remarks/Additional Impact on Environment
1	iii	The memorial shall comprise a 190 m high statue of the Chhatrapati Shivaji Maharaj.	The memorial shall have a total height of 210 m from MSL, with 7m fort base,81.8 m high pedestal and 121.2m high statue of the Chhatrapati Shivaji Maharaj	Total height increased. **No additional impact on environment has been envisaged**.
2	iv	The identified location is an oval shaped Rocky outcrop at latitude $18^0$55'33.8" N and longitude $72^0$47'25.0" E, of approximately 15.6 ha. in size. The identified location is 1.2 km southwest of Raj Bhavan, 3.6 km southwest of the Girgaon jetty and 2.6 km west of Nariman point.	The identified location is an oval shaped Rocky outcrop at latitude $18^0$55'33.8" N and longitude $72^0$47'25.0" E. The project is planned with an area of 6.8347 Ha. The facilities are planned for 10,000 visitors per day and project will be undertaken inphase wise manner.. The identified location is 1.2 km southwest of Raj Bhavan, 3.6 km southwest of the Girgaon jetty and 2.6 km west of Nariman point.	Location is the same. **No additional impact on environment has been envisaged.**
3	v	The statue will be built on rocky outcrop, which is exposed only during low tide and hence sheet pile walls are proposed to be erected along the boundary of the project site to prevent sliding and wall of 13 m height is proposed to protect the area from sea water. There should not be any impact on marine life at the time of driving sheet piles and also boundary wall should be designed for Tsunami/Storm Surge.	The statue will be built on rocky outcrop, which is exposed only during low tide. A rock bund will be constructed upto level of 5.0 m above CD and a Laterite wall of 6.1 m built atop of rock bund all around the island. There should not be any impact on marine life at the time of driving sheet piles and also boundary wall should be designed for Tsunami/Storm Surge.	Sea wall height reduced. **No additional impact on environment has been envisaged**

<table>
<tr><th>S. No.</th><th>EC Clause No.</th><th>Earlier Proposal</th><th>Revised Proposal</th><th>Remarks/Additional Impact on Environment</th></tr>
<tr>
<td>4</td>
<td>ix</td>
<td>The area assigned for different infrastructure facilities as follows:
<table>
<tr><th>S. No.</th><th>Description</th><th>Area (Sqm)</th></tr>
<tr><td>1</td><td>Total Area Cover (Rock Surface Area)</td><td>15.96 ha</td></tr>
<tr><td>2</td><td>Area of pedestal at ground floor</td><td>16237.00</td></tr>
<tr><td>3</td><td>Area of pedestal at first floor</td><td>10024.00</td></tr>
<tr><td>4</td><td>Area of pedestal at second floor</td><td>5302.00</td></tr>
<tr><td>5</td><td>Area of residence for staff security</td><td>6000.00</td></tr>
<tr><td>6</td><td>Roads and platforms</td><td>28410.00</td></tr>
<tr><td>7</td><td>STP & WTP</td><td>409.00</td></tr>
<tr><td>8</td><td>Public Toilets</td><td>300.00</td></tr>
<tr><td>9</td><td>Helipad</td><td>790.00</td></tr>
<tr><td>10</td><td>Jetty (2 main, 1 jetty for VIP and 1 jetty for service)</td><td>100 X 12</td></tr>
</table>
</td>
<td>The area assigned for different infrastructure facilities as follows:
<table>
<tr><th>S. No.</th><th>Description</th><th>Area (Sqm)</th></tr>
<tr><td>1</td><td>Site Area</td><td>68347</td></tr>
<tr><td>2</td><td>Ground Coverage</td><td>14003</td></tr>
<tr><td>3</td><td>Built Up Area Of Ancillary Buildings</td><td>9628</td></tr>
<tr><td>4</td><td>Built Up Area Of Pedestal</td><td>42194</td></tr>
<tr><td>5</td><td>Total Built-up Area</td><td>58993</td></tr>
<tr><td>6</td><td>Green area</td><td>24142</td></tr>
<tr><td>7</td><td>Hard scaped area</td><td>14597</td></tr>
<tr><td>8</td><td>Visitors jetty (1 no.)</td><td>9000</td></tr>
</table>
</td>
<td>Proposed facilities changed.

No additional impact on environment has been envisaged</td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td>The central core of the pedestal has to support the statue of Chhatrapati Shivaji Maharaj, which is about 160 m in height from the base.</td>
<td>The memorial shall have a total height of 210 m from MSL, with 7m fort base,81.8 m high pedestal and 121.2m high statue of the Chhatrapati Shivaji Maharaj</td>
<td>Height of Statue decreased, however total height increased including pedestal height.
No additional impact on environment has been envisaged.</td>
</tr>
<tr>
<td>6</td>
<td>xi</td>
<td>It consists of three layer pedestal of concrete (M60 grade) with stone cladding of natural stone (Granite). The natural stone granite is suggested by the Department of Earth Science of IIT</td>
<td>The 81.8 m high pedestal has (and 7 m fort base) been designed as a two tiered structure stepping back to create a stepped tiered effect. The structure is clad in Granite as suggested by the Department of Earth Science</td>
<td>Height of pedestal is increased.
No additional impact on environment has been envisaged.</td>
</tr>
</table>

S. No.	EC Clause No.	Earlier Proposal	Revised Proposal	Remarks/Additional Impact on Environment
		Bombay, Mumbai.	of IIT Bombay, Mumbai.	
7	xii	The height of the pedestal is 32.5 m. The first level of pedestal is about 140 m X 140 m X 10 m in dimension; second level of pedestal is about 110 m X 110 m X 10 m; the dimension of third level of pedestal is 80 m X 80 m X 10 m.	The 81.8 m has (and 7 m fort base) high pedestal has been designed as a two tiered structure stepping back to create a stepped tiered effect. The size of the pedestal is maximum 140 mtr x 60 mtr.	Height of pedestal is increased, whereas the footprint is decreased. **No additional impact on environment has been envisaged.**
8	xv	Ready mix concrete of M60 grade will be pumped from the Raj Bhavan side through 30 mm diameter HDPE pipeline with help of pump of capacity 4000 HP.	Ready mix concrete mounted barges will be used to transport M60 grade concrete from Dighi/Mumbai Port Trust (MbPT) Jetty to the Island. After that construction material will be transported on barges from Dighi Port/MbPT jetty, prefabricated components will be used for a majority of the components and cast in-situ concrete will be minimized.	Mode of transportation of construction material has been changed. **Adequate measure to prevent contamination due to material transport and handling has already been proposed. Hence, no additional impact on environment is envisaged.**
9	xvi	The steel & 40000 m^2 natural granite stones will be transported from Mumbai Port to the project site through barges. The armour layer of breakwater will be made of tetrapod to withstand the expected design wave height. A temporary jetty will be constructed for unloading the materials and machinery transported through the barge.	Ready mix concrete mounted barges will be used to transport M60 grade concrete from Mumbai Port Trust (MbPT) Jetty to the Island till the cofferdam construction. After that construction material will be transported on barges from MbPT jetty to the batching plant on the proposed island. The armour layer is proposed of Rock with Accropode or Accropode II. Numerical model study is carried out to establish design wave, water level, wave tranquility at breakwater locations. A temporary jetty will be constructed for unloading the materials and machinery	The armour layer material is changed. **No additional impact on environment has been envisaged.**

S. No.	EC Clause No.	Earlier Proposal	Revised Proposal	Remarks/Additional Impact on Environment
			transported through the barge.	
10	xvii	The berthing jetty will be on concrete piles. The fortified wall will be made of concrete structure.	The berthing jetty will be on concrete piles. The fortified wall will be made of laterite stone with lime cement mortar.	Construction material of fortified wall has been changed. **No additional impact on environment has been envisaged.**
11	xxix	The cost of the project is Rs. 1900 Crores.	The cost of the project is Rs. 2500 Crores	Cost increased. Parameter is independent to **Environmental Impact.**

FORM-1

(I) Basic Information

S. No.	Item	Details
1.	Name of the Project	Proposed construction of Chhatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapati Shivaji Maharaj in the Arabian Sea of the coast of Mumbai, Maharashtra
2.	S. No. in the schedule.	8 (a)
3.	Proposed Capacity/ Area/ length/ tonnage to be handled/ command area /lease area /number of wells to be drilled.	6.8347 ha
4.	New/Expansion/Modernization	New
5.	Existing Capacity/Area	Not Applicable (NA)
6.	Category of Project i.e 'A' or 'B'	**Category 'A'**
7.	Does it attract general condition? If Yes please specify.	No
8.	Does it attract specific condition? If Yes please specify.	No
9.	Location	
	Plot / Survey/ Khasra No.	NA
	Village	Mumbai
	Tehsil	Mumbai
	District	Mumbai City
	State	Maharashtra
10.	Nearest Railway Station/ Airport along with distance in Km.	Chatrapati Shivaji Terminus, 6 km Chatrapati Shivaji International Airport, 17 km
11.	Nearest Town, City, District Headquarters along with distance in Km.	Mumbai, 2 km
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (Complete postal addresses with telephone nos. to be given).	Municipal Corporation of Greater Mumbai, Chatrapati Shivaji Terminus- 400001
13.	Name of the Applicant	Chief Engineer (Special Projects), Public Works Department, Government of Maharashtra

S. No.	Item	Details
14.	Registered Address	Chief Engineer (Special Projects), PWD, Bandhkam Bhavan, 4th floor, 25, Murzban Road, Fort, Mumbai, Maharashtra
15.	Address for correspondence	Chief Engineer (Special Projects), PWD, Bandhkam Bhavan, 4th floor, 25, Murzban Road, Fort, Mumbai, Maharashtra
	Name	Himanshu Shrimal
	Designation (Owner/Partner/ CEO)	Chief Engineer
	Address	Chief Engineer (Special Projects), PWD, Bandhkam Bhavan, 4th floor, 25, Murzban Road, Fort, Mumbai, Maharashtra
	Pin Code	400001
	E-mail	sp.ce@mahapwd.com
	Telephone No	022-22072510
	Fax No.	022-22073467
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	Yes. Details of alternatives enclosed in Additional attachments.
17.	Interlinked Projects	No
18.	Whether separate application of interlinked project has been submitted?	Not Applicable
19.	If yes, date of submission	Not Applicable
20.	If no, reason	Not Applicable
21.	Whether the proposal involves approval/clearance under; if yes, details of the same and their status to be given.	
	(a) The forest (Conservation) Act, 1980?	No
	(b) The wildlife (Protection) Act, 1972	No
	(c) The C.R.Z Notification	Yes, MCZMA recommended the proposal. Copy enclosed in Additional attachments.
22.	Whether there is any Government Order/Policy relevant/ relating to the site?	None

S. No.	Item	Details
23.	Forest land involved (hectares)	No
24.	Whether there is any litigation pending against the project and/or land which the project is propose to be set up?	No
	a) Name of the Court	NA
	b) Case No.	NA
	c) Order/direction of the Court, if any and its relevance with the proposed project.	NA

***Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.,)*

I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project be rejected and the clearance give, if any to the project will be revoked at our risk and cost.

Chief Engineer,
Special Project (PW)
Mumbai

(II) ACTIVITY

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S.N.	*Information/Checklist confirmation*	*Yes/ No*	*Details thereof (with approximate quantities / rates, wherever possible) with source of information data*
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	6.8347 ha area of oval shape rocky outcrop will be reclaimed for the Development of Chatrapati Shivaji Maharaj Memorial in the Arabian Sea off the coast of Mumbai.
1.2	Clearance of existing land, vegetation and buildings?	No	
1.3	Creation of new land uses?	No	
1.4	Pre-construction investigations e.g. bore houses, soil testing?	No	
1.5	Construction works?	Yes	Development of Chatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapati Shivaji Maharaj
1.6	Demolition works?	No	
1.7	Temporary sites used for construction works or housing of construction workers?	No	
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	No	
1.9	Underground works including mining or tunneling?	No	
1.10	Reclamation works?	Yes	6.8347 ha area of oval shape rocky outcrop will be reclaimed for the Development of Chatrapati Shivaji Maharaj Memorial in the Arabian Sea off the coast of Mumbai.
1.11	Dredging?	No	
1.12	Offshore structures?	Yes	Development of Chatrapati Shivaji Maharaj Memorial along with equestrian statue of Chhatrapati Shivaji Maharaj
1.13	Production and manufacturing processes?	No	
1.14	Facilities for storage of goods or materials?	No	
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Sewage treatment plant of 260 KLD is proposed. STP treated water will be reused for flushing & HVAC system, so that there will be zero discharge of liquid effluent.

S.N.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
1.16	Facilities for long term housing of operational workers?	Yes	10 bedded medical facility and 30 bedded Staff Quarter has been proposed including other amenities like toilets, offices etc.
1.17	New road, rail or sea traffic during construction or operation?	Yes	The Annual Average Daily Tourists at proposed Memorial projected to be 10,000 and 4000 at the peak hour.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	The Annual Average Daily Tourists at proposed Memorial projected to be 10,000 and 4000 at the peak hour. In future the tourist population may increase; same can be accommodated to the existing jetty by increasing the turnaround frequency of vessels.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	
1.20	New or diverted transmission lines or pipelines?	No	
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	
1.22	Stream crossings?	No	
1.23	Abstraction or transfers of water form ground or surface waters?	Yes	Desalination Plant of 160 KLD (one running & one stand-by) and RO Plant of 22,250 LPD capacity have been proposed to cater the water requirement.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Steel, granite, laterite, sand will be transported from Dighi Port by barrages. Ready mix concrete mounted barges will be used to transport M60 grade concrete from Port to the Island. A majority of the construction proposed shall be pre-fabricated offsite with minimum in-situ construction.
1.26	Long-term dismantling or decommissioning or restoration works?	No	
1.27	Ongoing activity during decommissioning which	No	

S.N.	*Information/Checklist confirmation*	*Yes/ No*	*Details thereof (with approximate quantities / rates, wherever possible) with source of information data*
	could have an impact on the environment?		
1.28	Influx of people to an area in either temporarily or permanently?	Yes	Only temporary influx of workforce will be there during construction and the team of workers will be demobilized from the site as soon as the construction activity is over.
1.29	Introduction of alien species?	No	
1.30	Loss of native species or genetic diversity?	No	
1.31	Any other actions?	No	-

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

S. No.	**Information/checklist confirmation**	**Yes/ No**	**Details thereof (with approximate quantities / rates, wherever possible) with source of information data**
2.1	Land especially undeveloped or agricultural land (ha)	No	
2.2	Water (expected source & competing users) unit: KLD	Yes	211 KLD fresh water will be required during operation. The source of fresh water will be treated water from desalination plant. 210 KLD STP treated water will be reused for flushing & HVAC system.
2.3	Minerals (MT)	No	Not Applicable
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	Yes	• Cement 105000 MT • Sand 75000 M^3 • Stone chips 150000 M^3 • Steel reinforcement 33000 MT • Quarry run stone 80,000 MT • Filter layer stone 7000 M^3 • Armour layer stone 2,22,000 MT • Sand for reclamation 1000000 M^3
2.5	Forests and timber (Source – MT)	No	No forest resources will be utilized for the project execution.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	3 DG sets of 1500 kVA & 1 DG set of 750 kVA will be installed to fulfill the power requirement. 12960 litre HSD will be required for daily operation of DG sets. HSD oil storage tank of 75KL is planned for storage of High Speed Diesel for Generator sets
2.7	Any other natural resources (use appropriate standard units)	No	

3. **Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.**

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	Storage of HSD. HSD oil storage tank of 75KL is planned for storage of High Speed Diesel for Generator sets.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	
3.3	Affect the welfare of people e.g. by changing living conditions?	No	This project will benefit the land side local community, since tourism to the area will increase.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	
3.5	Any other causes	No	

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	
4.2	Municipal waste (domestic and or commercial wastes)	Yes	The estimated quantity of municipal Solid waste generated; approximately 1.12 tonnes/ day, considering 112g/person/visit of the tourist. Beside this from 30 bedded staff barrack and minor medical waste from 10 bedded hospital likely to be generated.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Hazardous materials will be transported in leak-proof sealed barrels through Barges.
4.4	Other industrial process wastes	No	
4.5	Surplus product	No	
4.6	Sewage sludge or other sludge from effluent treatment.	No	
4.7	Construction or demolition wastes	Yes	Construction waste will be disposed off as per green building norms.
4.8	Redundant machinery or equipment	No	
4.9	Contaminated soils or	No	

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
	other materials		
4.10	Agricultural wastes	No	
4.11	Other solid wastes	No	

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Emissions are envisaged from DG sets. All DG set will provided with environmental protection measures for the compliance of existing emission standards.
5.2	Emissions from production processes	No	
5.3	Emissions from materials handling including storage or transport	Yes	Dust may be generated during storage & transportation of construction material, proper mitigation measures will be taken care.
5.4	Emissions from construction activities including plant and equipment	Yes	Contractor will obtain NOC for the establishment & operation of construction plant and strictly follow the environmental management plan for the compliance of existing emission standards.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	Yes	Dust may be generated during storage & transportation of construction material, proper mitigation measures will be taken care. For the treatment of sewage, STP of 260 KLD is proposed.
5.6	Emissions from incineration of waste	No	
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	
5.8	Emissions from any other sources	No	

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S.N.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Construction techniques and machinery selection seeking to minimize noise. All the Construction equipment's will be operated with noise abating devices.
6.2	From industrial or similar processes	No	Not Applicable
6.3	From construction or demolition	No	

S.N.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.4	From blasting or piling	No	
6.5	From construction or operational traffic	No	
6.6	From lighting or cooling systems	Yes	LEDs will be used for lighting.
6.7	From any other sources	No	

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S. No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	Oils and lubricants will be stored for the construction activities with all the prescribed anti-spill measures. Provisions will be made so that spills are collected, stored and disposed off aesthetically. HSD storage facility will be provided with protection measures. HSD transportation pipe from ship to storage tank will be provided to check the spill.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	Sewage will be treated in proposed STP of 260 KLD. STP treated water will be reused for flushing & HVAC system. There will be zero discharge from the memorial.
7.3	By deposition of pollutants emitted to air into the land or into water.	No	
7.4	From any other sources	No	
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances.	Yes	Firefighting facilities are proposed. Disaster Management Plan will be implemented.
8.2	From any other causes	No	
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	All the safety standards & codes will be followed during design & construction to avoid any damage due to any natural disaster.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality:

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:	No	
	Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)	No	
	Housing development	No	
	Extractive industries	No	
	Supply industries	No	
	Other	No	
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not Applicable
9.3	Set a precedent for later developments	No	
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Not Applicable

(III) Environmental Sensitivity

S. No.	Areas	Name/ Identity	Aerial distance (within 15 Km) Proposed project location boundary
1	Areas protected under	No	

S. No.	Areas	Name/ Identity	Aerial distance (within 15 Km) Proposed project location boundary
	international conventions, national or local legislation for their ecological, landscape, cultural or other related value		
2	Areas which are important or sensitive for ecological reasons -Wetlands, Watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Yes	Project falls in CRZ area.
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	
4	Inland, coastal, marine or underground waters	Yes	Project located in Arabian sea.
5	State, National boundaries	No	
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	
7	Defense installations	No	---
8	Densely populated or built-up area	No	
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	No	
10	Areas containing important, high quality or scarce resources *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	None	
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	No	
12	Areas susceptible to natural hazard which could cause the project to present environmental problems	No	

S. No.	Areas	Name/ Identity	Aerial distance (within 15 Km) Proposed project location boundary
	(earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)		

(IV) Proposed Terms of Reference (TOR) for EIA Study.