



**Navi Mumbai Municipal Corporation
C.B.D. Navi Mumbai - 400614**

TENDER

EPC /NMMC/ CITY ENGINEER / 318 /2023-2024

CITY ENGINEER DEPARTMENT

**Tender for the work of
Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm
Beach Road at Ghansoli, Navi Mumbai on EPC mode.**


NMMC Stage	Vendor Stage	Start Date & Time	Expiry Date & Time
Release of Tender	--	06/11/2023 10.00 Hrs.	21/12/2023 15.00 Hrs.
--	Tender Download & Bid Preparation	06/11/2023 10.00 Hrs.	21/12/2023 15.00 Hrs.
Pre-bid Meeting	Pre-bid Meeting	20/11/2023 11.00Hrs	
Envelope 1 opening	--	21/ 12 /2023 (If possible) at 16.00 Hrs.	
Envelope 2 opening	--	21/12/2023 (If possible)	

City Engineer Department

Navi Mumbai Municipal Corporation

2nd Floor Head Office Building,


C.B.D., Belapur, Navi Mumbai – 400614.


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Name of Work: “Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.”

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	नवीमुंबई महानगरपालिका नमंमपामुख्यालय, भु.क्र.1, किल्लेगावठाणजवळ, पामबीचजंक्शन, सेक्टर-15ए, सी.बी.डी., बेलापूर, नवीमुंबई-400 614 दुरध्वनीक्र. : 2756 7130	NAVI MUMBAI MUNICIPAL CORPORATION NMMC Headquarter, Plot No.1, Near Kille Gaonthan, Palmbeach Junction, Sector-15A, C.B.D., Belapur, Navi Mumbai - 400 614. TEL. No. : 2756 7130
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शहर अभियंता विभाग

निविदा सूचना क्र.ई.पी.सी./नमंमपा/शहर अभियंता/318/2023-24

नवी मुंबई महानगरपालिका मार्फत "नमंमपा क्षेत्रातील घणसोली येथील पामबीच मार्गावरील घणसोली ते ऐरोली खाडीपूल बांधणे (EPC तत्वावर)" अशा कामांचा पुर्वानुभव असलेल्या कंत्राटदाराकडून online निविदा मागवित आहेत.

नवी मुंबई महानगरपालिकेत online निविदेकरीता ई-टेंडरिंग संगणक प्रणाली (E-tendering) कार्यान्वित करण्यात आलेली आहे. रु.3.00 लक्ष किंवा त्यापेक्षा अधिक रकमेचे कामांकरीता सर्व कंत्राटदार/पुरवठादार यांनी ई-टेंडरिंग संगणक प्रणाली मधूनच (इंटरनेटद्वारे) निविदा खरेदी करावयाच्या व भरावयाच्या आहेत.

सदरह कामांचा संक्षिप्त तपशील खालील प्रमाणे आहे.

अ. क्र.	कामाचे नाव	अंदाजपत्रकिय रक्कम(रु.)	इसारा रक्कम(रु.)	कोरी निविदा फॉर्म फी(रु.)	कामाचा कालावधी
1	नमंमपा क्षेत्रातील घणसोली येथील पामबीच मार्गावरील घणसोली ते ऐरोली खाडीपूल बांधणे (EPC तत्वावर)	411,51,12,400/- + 18 % GST	2,05,76,000/-	5,000/-+900/- GST	30 महिने(2 पावसळ्यासह)

निविदा पुस्तिका ई-टेंडरिंग (e-tendering) संगणक प्रणालीच्या (www.nmmc.etenders.) या संकेतस्थळावर व नमंमपाच्या (www.nmmc.gov.in) संकेत स्थळावर प्राप्त होतील. निविदेचे सादरीकरण खालील तक्त्यात नमुद केल्याप्रमाणे www.nmmc.etenders. या संकेतस्थळावर **online** सादर करण्याचे आहे.


ई-निविदा प्रसिध्दीचा तपशील


ई-निविदा विक्री व भरणे (upload) कालावधी	दिनांक 06/11/2023 सकाळी 10.00 पासून दिनांक 21/12/2023 रोजी दुपारी 1.00 वाजेपर्यंत
ई -निविदा पूर्व बैठक (Pre-bid Meeting)	दिनांक 20/11/2023 रोजी सकाळी 11.00 वाजता
ई-निविदा सादरीकरण (submission) कालावधी	दिनांक 21/12/2023 रोजी दुपारी 3.00 वाजेपर्यंत
ई-निविदा उघडण्याचा दिनांक	दिनांक 21/12/2023 दुपारी 4.00 वाजता शक्य झाल्यास

निविदाकारांनी कोरी निविदा फॉर्म फी, इसारा अनामत रक्कम व सेवाशुल्क ऑनलाईन पेमेंटगेटवेद्वारे भरावयाचे आहे. वरील नमुद सर्व शुल्क कोणत्याही बँकेचे डेबिटकार्ड, क्रेडिट कार्ड अथवा नेट बँकींग मार्फत भरणारकरता येईल. निविदा फॉर्म फी शुल्क नमंमपाचे लेखा विभागात स्विकारले जाणार नाही, तसेच कायमस्वरूपी अनामत रक्कम (Fixed EMD) स्विकारली जाणार नाही याची निविदाकारांनी नोंद घ्यावी

कोणतीही निविदा स्वीकारणे अथवा ना कारण्याचा अधिकार आयुक्त, नवी मुंबई महानगरपालिका यांनी राखून ठेवलेला आहे.

**शहर अभियंता
नवी मुंबई महानगरपालिका**

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	नवीमुंबई महानगरपालिका नमंमपामुख्यालय, भु.क्र.1, किल्लेगावठाणजवळ, पामबीचजंक्शन, सेक्टर-15ए, सी.बी.डी., बेलापूर, नवीमुंबई-400 614 दुरध्वनीक्र. : 2756 7130	NAVI MUMBAI MUNICIPAL CORPORATION NMMC Headquarter, Plot No.1, Near Kille Gaonthan, Palmbeach Junction, Sector-15A, C.B.D., Belapur, Navi Mumbai - 400 614. TEL. No. : 2756 7130
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City Engineer Department

Tender Notice No. EPC/NMMC/City Engineer/ 318/2023-24

Navi Mumbai Municipal Corporation invites bids from eligible bidders for Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.

E-tendering computer system (E-tendering) has been implemented in Navi Mumbai Municipal Corporation for online tendering. All contractors/suppliers for works worth Rs.3.00 lakh or above are to purchase and pay tenders through e-tendering computer system (through internet).

Brief details of these works are as follows.

अ. क्र.	Name of Work	Estimated Cost (Rs.)	EMD (Rs.)	Blank Tender Form Fee (Rs.)	Duration of work
1	Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.	411,51,12,400/- + 18% GST	2,05,76,000/-	5,000/-+900/- GST	30 months (Including Monsoon)

Tender booklets will be available on e-tendering at <https://nmmc.etenders.in> and at www.nmmc.gov.in website of NMMC on dt. 06/11/2023. The tender is to be submitted online at <https://nmmc.etenders.in> for any technical difficulties in the e-tendering process, please contact the help desk number given on this website.


Details of e-tender publication

E-tender sale and upload period	Dated 06/11/2023 from 10.00 A.M Dated 21/12/2023 upto 1.00 PM
Pre-bid Meeting	Dated 20/11/2023 at 11.00 AM
E-tender submission period	Dated 21/12/2023 upto 3.00 PM
Date of opening of e-tenders	Dated 21/12/2023 at 4.00 PM if possible

Tenderers are required to fill in the blank tender form fee, EMD deposit and service fee online. All mentioned charges can be paid by debit card or net banking of any bank. The tenderer should note that the Blank tender form fee will not be accepted in the NMMC Account department. Fixed EMD is not acceptable.

The right to accept or reject any tender is reserved by the Hon'ble Commissioner of Navi Mumbai Municipal Corporation.

City Engineer
Navi Mumbai Municipal Corporation

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शहर अभियंता विभाग
निविदा सूचना क्र. ई. पी. सी./नमुंमपा/शहर अभियंता/ /2023-24


अ.क्र.	कामाचे नाव	अंदाजपत्रकिय रक्कम (रु.)
1	नमुंमपा क्षेत्रातील घणसोली येथील पाम बीच मार्गावरील घणसोली ते ऐरोली खाडी पूल बांधणे (EPC तत्वावर)	411,51,12,400/-

निविदा पुस्तिका ई-टेंडरिंग (E-Tendering) संगणकप्रणालीच्या <https://nmmc.etenders.in> या संकेतस्थळावर व नमुंमपाच्या www.nmmc.gov.in या संकेतस्थळावर दिनांक 06/11/2023 रोजी प्राप्त होतील. निविदेचे सादरीकरण <https://nmmc.etenders.in> या संकेतस्थळावर Online करण्याचे आहे. ई-निविदा ई-टेंडरिंग (E-Tendering) प्रक्रियेतील कोणत्याही तांत्रिक अडचणीसाठी सदर संकेतस्थळावर दिलेल्या हेल्प डेस्क नंबर वर संपर्क करावे.

निविदाकारांनी कोरी निविदा फॉर्म फी, इसारा अनामत रक्कम व सेवा शुल्क ऑनलाईन भरावयाचे आहे. कोरी निविदा फॉर्म फी, इसारा अनामत रक्कम व सेवा शुल्क कोणत्याही बँकेचे डेबिट कार्ड अथवा नेटबँकींग मार्फत भरणा करता येईल. निविदा फॉर्मची शुल्क नमुंमपा चे लेखा विभागात स्विकारले जाणार नाही. तसेच कायम स्वरूपी अनामत रक्कम(Fixed EMD) स्विकारली जाणार नाही याची निविदाकारांनी नोंद घ्यावी.

कोणतीही निविदा स्विकारणे अथवा नाकारण्याचा अधिकार मा. आयुक्त, नवी मुंबई महानगरपालिका यांनी राखून ठेवलेला आहे.

शहर अभियंता
नवी मुंबई महानगरपालिका

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City Engineer Department

Tender Notice No. EPC/NMMC/City Engineer/ /2023-24


Sr. No.	Name of Work	Estimated Cost (Rs.)
1	Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.	411,51,12,400/-

Tender booklets will be available on e-tendering at <https://nmmc.etenders.in> and at www.nmmc.gov.in website of NMMC on dt. 06/11/2023. The tender is to be submitted online at <https://nmmc.etenders.in> for any technical difficulties in the e-tendering process, please contact the help desk number given on this website.

Tenderers are required to fill in the blank tender form fee, EMD deposit and service fee online. All mentioned charges can be paid by debit card or net banking of any bank. The tenderer should note that the Blank tender form fee will not be accepted in the NMMC Account department. Fixed EMD is not acceptable.

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**City Engineer
Navi Mumbai Municipal Corporation**

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Units & Abbreviations


Units of measurement, symbols and abbreviations expressed in the Bid Documents Bidders shall comply with the System International Units (SI Units).

Abbreviations

The following abbreviations shall be used in the Bid

Document:

Chainage	Ch
Employer	NMMC
Employer's Representative	ER
General Conditions of Contract	GCC
Government of Maharashtra	GOM
Indian National Rupees	INR
Interim Payment Certificate	IPC
Kilometer	km
Navi Mumbai Municipal Corporation	NMMC/Corporation
Maharashtra State Road Development Corporation Ltd.	MSRDC
Maharashtra Industrial Development Corporation	MIDC
City and Industrial Development Corporation	CIDCO
Maharashtra Transmission Co. Ltd	Mahatransco
Mumbai Urban Infrastructure Project	MUIP
Extended MUIP	Ext. MUIP
Public Works Department	PWD
Non Pressure	NP
Number	No.
Particular Conditions	PC
Provisional Sum	PS
Reinforced Cement Concrete	RCC
Safe Bearing Capacity	SBC
Slum Rehabilitation Authority	SRA
State Bank of India Prime Lending Rate	SBI PLR
Bid Data Sheet	BDS
Engineering, Procurement, Construction	EPC
Engineer in charge (City Engineer)	EIC

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SCHEDULE 'A'

NMMC invites EPC Tender through E-Tendering system from Contractors having adequate experience of Similar Works Blank Tender forms will be available from **06/11/2023 up to 21/12/2023 15:00 hrs** on E-Tendering website www.nmmc.maharashtra.etenders.in or <https://nmmc.etenders.in> and at www.nmmc.gov.in and at www.nmmc.gov.in to download the blank tenders, the bidders shall pay tender cost paid through online payment gateway by using Credit Card/Debit Card of any bank or by Net Banking in favour of NMMC. The Tender should be submitted through E-Tendering system only on the web site <https://nmmc.etenders.in> and at www.nmmc.gov.in before **21/12/2023** upto 15.00 hrs .

1. Name of Work **Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.**
2. Estimated cost of Work **Rs. 411,51,12,400/- +18% GST**
3. Engineers for this Work Executive Engineer (Ghansoli - Airoli Bridge Project)
Deputy Engineer (Ghansoli - Airoli Bridge Project)
4. Period of sale of Tender Downloaded from 06/11/2023 to 21/12/2023 official web site / Documents. <https://nmmc.etenders.in> of the Corporation.
5. Cost of each tender form **Rs.5000/-+ 900/-GST shall be paid online only.**
6. Earnest Money **Rs. 2,05,76,000/-**(EMD should be 0.50% of Estimated amount)
Payable through online payment gateway by RTGS/NEFT/
from bidders/ Agencies bank account only, in favour of Navi Mumbai Municipal Corporation. Online receipt for the same should be uploaded with the technical documents.

Fixed EMD will not be accepted.


7. Pre-Tender Conference will be held on - 20/11/2023 on 11.00 hours at NMMC Head Office, 2nd Floor, City Engineer's Conference Hall. Sector 15A, CBD Belapur, Navi Mumbai.

For site visit Please contact

Shri. Manohar A. Sonawane Executive Engineer (Mb: 07021612094)

Shri. Yashawant S. Kapse Deputy Engineer (Mb: 08369112098)

8. Last date of receipt of tender 21/12/2023 Up to 15.00 hours
9. Probable date and time of opening - Date 21/12/2023 at 16.00 hours (if possible)
10. **Eligibility**

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Registration

Above 1.50 crs works Registration not required.

I) Turn Over: -

Maximum Annual financial turnover during the last 5 Years, ending 31st March of the previous financial year, should be at least 75 % of the annual cost of this work

$$(\text{Annual cost}) = \frac{(\text{Total cost of the work})}{(\text{Completion period in years})}$$

The Net worth should be positive and bidder should submit the Net Worth Certificate in Technical Envelope.


II) Experience:-

A] Experience of having satisfactorily completed work amount as mentioned below at sr. no. 1,2 & 3 similar works during last 5 years ending last day of month previous to the one in which bids are invited should be following **should be as follows –**

1. **One similar work with cost of work done not less than the 80% of cost put to the tender i.e. Rs. 329.21 Crore, as a prime contractor. OR**
2. **Two similar work with cost of work done not less than the 50% of cost put to the tender i.e. Rs. 205.76 Crore, as a prime contractor. OR**
3. **Three similar work with cost of work done not less than the 40% of cost put to the tender i.e. Rs. 164.60 Crore, as a prime contractor.**

Similar Work: -

- a) Design & Construction of 4/6 Lane Bridge / flyover in urban area of 1.3 KM length or more of PSC segmental type super structure.
- b) The bidder / lead member should have successfully completed at least one work of 4/6 lane bridge / flyover in urban area and having at least one span of 50 m length over creek / river / nallah. The 6-lane bridge experience shall be of segmental box type construction. And project cost should be minimum 40% of estimated cost in last 5 years in MMR Region.
- c) The bidder / each member in case of Jv. Should have experience of successfully completed minimum one bridge/ flyover with PSC superstructure in MMR region in last 5 years with a cost of minimum 150 crores.
- d) The bidder / each member in case of Jv. Should not have made losses in any of the last 3 financial years.

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- e) JV of 2 members is allowed. The share of lead member should be minimum 51 %.
- f) The Bidder / Lead member should have an operational batching plant of minimum capacity of 60 cum / hr in MMR in last 2 years.
- g) The Bidder/ Jv. Member should have executed Successfully completed at least one Design and construction project using 5D Building Information Modelling (BIM) with LOD 500 in last 5 years or Bidder may associate with specialized agency having similar experience.

Note:

- a) The weightage for updating of costs will be done @ 10% p.a. to arrive at 2023-24 prices. While updating costs in this manner, the total cost of completion only will be updated based on the year in which the work is completed.
- b) Joint Ventures are allowed.

AND

- B] Experience of having Similar Type of minimum 3 & max.5 main items in Government /Semi Government / Municipal Corporation/any other public sector as a prime contractor in tendered work during one of the last 5 years amounting to 30% of tendered main work quantity

Main Items executed for construction of bridge/bridge work.

1. R.C.C. pile foundation - 2300 Rmt
2. R.C.C. super structure (Segmental girder) – 10,500 cum
3. Pavement Quality Concrete- 3200 Cum
4. Mastic asphalt- 13500 Sqm
5. TMT bar reinforcement with Fusion bonded epoxy coating- 10,500 MT

(For experience and turnover 10% increase will be considered up to current year.)


Eligibility criteria for works above Rs.50 Lakh As per GR No.सीएटी-2022/प्रा.क्र.50 इमारती-2, दि.11/05/2022, paragraph No.7 as Below

III) Bid Capacity :- $(A \times N \times 2) - B$

Whereas A = Maximum Annual turnover of last 5 (Five) year

(As per current Rate)


N = Period of work

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B = Cost of work in hand (within time period of work)

IV) Qualified Personnel: -

<u>Position</u>	<u>Name</u>	<u>Qualifications</u>	Years of relevant experience
Team Leader (Design)	*	ME/ M. Tech (Structures) in Bridge/ Bridge designs	20
Bridge Design Engineer	*	ME/ M. Tech (Structures)	15
Highway Design Engineer	*	ME/ M. Tech (Transportation)	10
Geo-Tech Engineer	*	ME/ M. Tech (Geotechnical Engineering)	10
Chief Project Manager	*	Graduate Civil Engineer	20
Project Manager / Sr. Site Engineer	*	Graduate Civil Engineer	10
Site Engineer- 5 Nos.	*	Graduate Civil Engineer	05
Bridge Engineer- 2 Nos.	*	Graduate Civil Engineer	05
Site Supervisor	*	Graduate / Diploma Civil Engineer	05
Surveyor	*	Graduate / Diploma Civil Engineer	05
Quality Control Engineer- 2 Nos.	*	Graduate Civil Engineer	07
Material Engineer	*	Graduate Civil Engineer	07
Safety Engineer- 2 Nos.	*	Graduate Civil Engineer with Construction safety certified course	07
Contract Expert	*	Graduate Civil Engineer	07
BIM Expert	*	Graduate Civil Engineer	05
Lab Technician -4 Nos	*	Graduate / Diploma Civil Engineer	05
Electrical Engineer	*	Graduate Electrical Engineer	07

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<u>Position</u>	<u>Name</u>	<u>Qualifications</u>	Years of relevant experience
Mechanical Engineer	*	Graduate Mech Engineer	10
Traffic Expert	*	Graduate Civil Engineer	10


V) Equipment required :-

Ownership is compulsory for Following machinery (necessary ownership documents shall be attached with the bid)

1. Ready Mix Concrete Plant with Capacity : 1 No.
60 Cum/hr. in MMR Region with valid MPCB certificate and all other govt. valid permissions for RMC plant.
2. Transit Mixers (5.5 cum capacity) : 10 Nos.
3. Concrete Pumps : 4 Nos.
4. Crane (350 MT capacities & above) : 2 Nos.
5. Piling Machinery: Hydraulically operated : 4 Nos.
6. JCB : 4 No.
7. Hydraulic Excavators with rock breaker
Attachment : 4 No.
8. Water Tanker : 4 No.
9. Mobile Cranes : 2 No.
10. Trailer 100MT capacity : 1 No
11. Segment Launching Gantry : 1 No.
12. Boom Placer (36 mt height) : 2 No.
13. DG Set –as required : 2 No.

Hiring is permitted for following machinery (necessary ownership documents & hiring agreement with machinery owner shall be attached with the bid)

1. An Integrated VSI stone crusher (min. 200TPH) in
MMR Region. : 1 No.
2. Slip Form Paver : 1 No.
3. Vibratory Rollers : 2 No.

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- | | | |
|----|----------------|----------|
| 4. | Poclain | : 2 No. |
| 5. | Grader | : 2 No. |
| 6. | Soil Compactor | : 2 No. |
| 7. | Dumpers | : 10 No. |

Only Owned will be considered (ownership proof of machinery to be submitted)

VI) Certification: - The Company Having ISO 9001, (Version 2000) Certificate, Will Be Preferred. No Relationship with Corporators See Clause 12 of Detailed Tender Notice

11. Validity Period – The offer of the Contractor shall remain valid for 120 days from the bid due date.

12. **Total Security Deposit - 1% of Tender Cost (rounded to next Rs. 1000/-) (Rs. 4,11,52,000/-)**

13. **Completion Period - 30 months (Including Monsoons)**

1. Contract as a whole Period of completion **30 Months (Including Monsoons)**
2. Part or Groups of items
 - (i) As a Whole work - **30 Months (Including Monsoons)**
 - (ii) As per approved bar chart


14. Percentage to be charges as supervision Charges for the Work got executed through other means.
24.50 Percent.

15. **Defects Liability Period** shall be as follows:

- a. For all Bridge structures (Pile-cap, Pier, Pier caps, Segments, Girders Deck slab, Abutments etc.) - **20 Years.**
- b. RCC works viz, Drain, CD works, etc. & PQC - **10 years.**
- c. Bitumen & Mastic Works - **5 years.**
- d. Other Painting works - **3 years.**
- e. Epoxy & Anticorrosive painting works - **7 years.**
- f. All other works including Electrical works - **5 years.**

16. Others: **Deleted**

17. 1) **Tenderer/Bidder Should Submit Affidavit & Undertaking (Annexure 2 & 9) In Requisite Format On Rs.500/- Stamp Paper, True documents affidavit on Rs. 100/- stamp paper & All Schedules are in prescribed format & updated up to date.**

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2) Tenderer/Bidder Should Note That as per the Construction Workers Welfare Act 1996, 1% Cess of Contract Value towards the Welfare of Construction Workers Will Be deducted From the Bills.

18. **Additional Performance Security Deposit** - The agency have to submit an undertaking along with Technical documents mentioned that “**Additional Performance Security Deposit submitted in envelope No.2**”.


The agency will have to furnish an additional 1 % Security Deposit quoted by it below 10% and in case the agency quotes 14% below the cost put to tender, it will have to furnish an additional security deposit of $(14\%) - (10\%) = 4\%$ i.e. $(1\%) + (4\%) = 5\%$. If agency quotes 19% Below the cost put to tender, it will have to furnish an additional security deposit of $(19\%) - (15\%) = 4\% \times 2 = 8\%$ Total $(1\% + 4\% + 8\%) = 14\%$ in financial Envelope No.(2) in the form of Bank Guarantee/FDR of any Govt. Bank or Schedule Bank having MICR and IFSC Code in the name of concern authority. The validity of Bank Guarantee should be up to defect liability period of works from the date of issue (For detail please refers the **GR No. सीएटी/2017/प्र.क्र.08/इमा-2, दि.27/09/2018**, for online Tender, The Agency Should upload the Scan Copy of Bank guarantee/FDR with Technical Document.

If the agency has not submitted online Additional Performance Security Deposit then he has to submit it within maximum 08 days without fail as per the **GR No. सीएटी/2017/प्र.क्र.08/इमा-2, दि.26/11/2018**

19. **Performance Guarantee:** - Performance Guarantee at the rate of 1% of the Project cost shall be deposited by the successful bidder in addition to Security Deposit at the time of Contract Agreement in the form of Bank guarantee. The same will be released after successful completion of work.
20. The bidder must have to submit the Hard Copy within 72 hours after the bid lock. Every Document should be self-attested by the bidder. Even if hard copy of tender is not submitted by bidder, his tender will be opened.
21. The Agency must submit the Royalty Challans at the time of R.A. Bills, if not the necessary charges will be deducted from the R.A. Bills.
22. Royalty including जिल्हाखनिजप्रतिष्ठानअंशदान (District Mineral Foundation Trust -DMFT) of only excavated disposed material will be reimbursed by NMMC after submission of challans by agency as per GR शासनउद्योग,उर्जाविकामगाविभागक्रंएमडीएफ-0615/प्र.क्र.34/उद्योग-9,दि.01/09/2016 & letter of शासनउद्योग,उर्जाविकामगाविभागक्रंएमडीएफ-2016/प्र.क्र.69/उद्योग-9,दि.20/09/2016


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23. As Per Government of Maharashtra Circular, GST has been come into account from 1st July, 2017 So Henceforth while quoting tender, Tenderer has to consider the GST factor (GR No शासनपरिपत्रकक्र-जीएसटी-2017/ प्र.क्र.81/कराधान/दि.19/08/2017 and दि.11/09/2017)
24. The GST amount as per applicable GR will be paid on work done amount at the time of bill.
25. Tenderer / Bidder should submit Affidavit on Rs.100/- Stamp Paper in the prescribed format attached herewith regarding the false documents submitted in the tender as per the GR No. सीएटी/2022/प्र.क्र.50/इमा-2, दि.11/05/2022.
26. Bank Solvency - 10% of estimate cost (applicable for the work above 5cr only)
27. Others
- 1) Special Conditions of Contract
 - 2) Price Variation Clause
 - 3) Additional Specifications
 - 4) Employers Requirements
28. If there is no resolution of dispute after discussion between concerned EIC and the contractor, the said dispute shall be referred to the Commissioner of Municipal Corporation for the purpose of endeavoring to settle the dispute amicably, If such amicable settlement is not arrived at between the parties, the disputes between parties shall be subject to exclusive jurisdiction of Courts of Navi Mumbai & Thane only. It is made clear that this clause is not an Arbitration clause and nothing in this clause shall be construed to mean that the Municipal Commissioner will act as an arbitrator.
29. **The bidder shall disclose the litigation history in Technical Documents under the head “Details of Litigation History” along with all supporting documents.**
- If there is no Litigation History, the bidder shall specifically mention that there is “No Litigation History” against him as per the clause of Litigation History. If bidder fails to submit this, his bid will be technically rejected.
- In case there is litigation History–Litigation History must cover – Any action of blacklisting, debarring, banning, suspension, deregistration and cheating with any Local self-Government Authority, State Govt., Central Govt. or any authority under State or Central Govt. / Govt. Organization initiated against the company, firm, directors, partners or authorized signatory shall be disclosed for last 5 years from the date of submission of bid.

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Also, bidder must disclose the litigation history for last 5 years from the date of submission of bid about any action like show cause issued, blacklisting, debarring, banning, suspension, deregistration and cheating with any Local self-Government Authority & Any Local self-Government Authority is party in the litigation against the company, firm, directors, partners or authorized signatory for carrying out any work for any Local self-Government Authority and the orders passed by the competent authority or by any Court where any Local self-Government Authority is a party. While taking decision on litigation history, Hon. Municipal Commissioner, City Engineer, as may be the case, should consider the details submitted by bidder and take decision based on the gravity of the litigation and also the details submitted by the bidder and take decision based on the gravity of the litigation and the adverse effect of the act of company, firm, directors, partners or authorized signatory on any Local self-Government Authority works which can spoil the quantity, output, delivery of any goods or any work execution and within the time frame. In case of Litigation History If bidder fails to submit the litigation history his bid will be technically rejected.

30. **Contractor has to fulfill all the requirements of MCZMA/SEIAA/Forest dept. /FCA (1980)/ESZ-TCFS/Thane Collector/High Court NOC/MPCB/NMMC Environment dept. & Tree Authority mentioned in their minutes of meetings attached as a separate annexures with this tender volume or hence forth as directed by the concerned authority. No additional cost shall be paid on this behalf.**
31. **LOI/ Work Order will be Issued only after the NOC from High Court and permissions from other Environmental Department. NMMC will not bear any cost for this delay.**
32. **The Commissioner, Navi Mumbai Municipal Corporation reserve the right to accept or reject any tender.**
33. **Other Information:** - The Bidder shall submit the following information to ascertain the Bidder's ability to take up and complete the Works under the current Bid.
 - i. Report on the financial standing of the Bidder, such as profit and loss account statements and auditor's reports signed by Chartered Accountant for the last Five years.
 - ii. Evidence of adequacy of working capital for this contract (access to lines of credit and availability of other financial resources.)
 - iii. Authority to seek references from the Bidders bankers.
 - iv. Information to ascertain the Bidder's capability of completing the work as per milestones specified within the stipulated times of completion with the following documents.

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1. Proposed Work Plan including Design capacity and schedule of design submissions and approvals.
2. Methodology of construction including traffic diversion and management on existing roads (if any)
3. Equipment, Planning and Personnel Deployment with broad calculations to assure their adequacy.
4. Quality Management Plan & Environmental Management Plan proposed to be adopted.
5. All Debris generated will have to be disposed to C & D Plant of NMMC at Turbhe.
6. Location of casting yard proposed for the work. Casting yard land will not be provided by corporation. The same shall be arranged by Bidder. No cost will be paid against the same.


NOTE: - Tender conditions mentioned in SCHEDULE- 'A' will supersede Tender condition mentioned in DETAILED TENDER NOTICE TO CONTRACTOR, GENERAL CONDITIONS OF CONTRACT & elsewhere in Tender document wherever applicable.

Signature of Tenderer

No. of corrections

Signature of Executive Engineer

Signature of City Engineer

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Navi Mumbai Municipal Corporation

C.B.D. Belapur, Navi Mumbai

(A Government of Maharashtra Undertaking)

Plot No.1& 2, Sect.15A, C.B.D., Belapur, Navi Mumbai

Tel: 2756 7070, 2756 7071

Website: www.nmmc.gov.in


E-mail: cityengineer@nmmc.gov.in

DETAILED TENDER NOTICE TO CONTRACTOR

- 1.0** Sealed bids are invited by and on behalf of Commissioner, Navi Mumbai Municipal Corporation from Eligible bidders for the proposed Work specified in Schedule 'A'.
- 2.0 ISSUE OF TENDER**
 - 2.1.** Tender book will be made available at E-tendering cell, Navi Mumbai Municipal Corporation, CBD from date of publication of Tender Notice on Newspaper to the Contractors for work of Tender Amount up to Rs.03 lakhs & above amount tender book may buy from E- tendering website (www.nmmc.etenders.in) & www.nmmc.gov.in
 - 2.2** For work of tender amount above Rs. 25 lakhs above, tender book will be issued online through E-tendering Website (www.nmmc.etenders.in) & (www.nmmc.gov.in) to Contractor.
 - 2.3** Price of blank Tender form cost must be paid by online and Receipt of the same should be given to NMMC with hard copy.
 - 2.4** The Tender Document is not transferable. Only the Tenderer who has purchased the tender form shall be entitled to bid in the Tender.
- 3.0 LANGUAGE OF TENDER / CONTRACT**

The language of the Contract shall be English/Marathi and all correspondence, drawings etc. shall confirm to the English/Marathi language.
- 4.0 PREBID CONFERENCE**

A Pre bid Conference of all the intending Tenderers will also be held at the scheduled date and time indicated in Schedule 'A' of the tender. Prebid conference is compulsory for all interested Bidders. Intending Tenderers will be allowed to seek clarification and suggest suitable modifications in specifications, conditions of the Contract etc. The Corporation will communicate such changes that are accepted by it, to all the intending Tenderers who have purchased the Tender document from the Corporation. Only such changes that are so communicated shall be binding on the Corporation

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and all the Tenderers.

5.0 VALIDITY OF BIDS

The bids will be valid for the period indicated in Schedule 'A'

6.0 EARNEST MONEY

The Tenderer shall deposit the amounts indicated in the Tender Notice as Earnest Money Deposit (EMD). The Earnest Money shall be deposited by online only, demand draft / pay order will not be accepted. The failure or omission to deposit the Earnest Money shall disqualify the Tender and the Corporation shall exclude from its consideration such disqualified Tender(s). No interest shall be payable by the Corporation in respect of such deposited Earnest Money.

The tenderer should refer user's guide while depositing EMD though the e-tendering website (www.nmmc.etenders.in) & www.nmmc.gov.in

7.0 FORFEITURE OF EMD

7.1 The Tenderer shall not revoke his Tender or vary its terms and conditions without the consent of the Corporation during the validity period of Tender. If the Tenderer revokes the Tender or vary its terms or condition contrary to his promise to abide by this condition, the Earnest Money deposited by him shall stand forfeited to the Corporation without prejudice to its other rights and remedies and the Tenderer shall be disentitled to submit a tender to the Corporation for execution of any Work during the next 24 months effective from the date of such revocation.

7.2 If Successful Tenderer does not pay the Security Deposit in the prescribed time limit or fails to sign the agreement bond, his Earnest Money Deposit will be forfeited by the Corporation.


8.0 REFUND OF EARNEST MONEY

The Earnest Money of unsuccessful Tenderers shall be refunded after the successful Contractor furnishes required Initial Security Deposit to the Corporation and sign the agreement or within 30 days of the expiry of validity period, whichever is earlier.

9.0 COST OF TENDER

The Tenderer shall bear all costs associated with the preparation and submission of its Tender. The Corporation shall in no case be responsible or liable for these costs, regardless of the Conduct or the outcome of the Tendering process.

10.0 ELIGIBLE TENDERERS

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Only those Contractors fulfill the Eligibility criteria as mentioned in the Schedule 'A' of the tender notice are eligible to submit their tender for this Work.

11.0 SPARE CAPACITY OF WORK FOR TENDERING

The Tenderers shall be eligible to submit the tender to the Corporation subject to the essential condition that the price tendered by him together with the value of the outstanding Works under execution by him for the Corporation or any other employer shall not be more than four times the value of the average annual turnover of Works executed during the preceding five financial years ending 31st March.

12.0 RELATION SHIP WITH CORPORATOR(S)

Tenderer shall not be associated presently or in the past with any of the office bearer or Cooperator of the Navi Mumbai Municipal Corporation either directly or indirectly as specified in the section 10(f), (g) of Maharashtra Mahanagar Palika Adhiniyam 1949. The Tenderer shall furnish an Affidavit on a Non-Judicial stamp paper of Rs.500/- If any information so furnished shall be found to be untrue or false, the tender shall be liable to be disqualified and the Earnest Money accompanying such tender shall stand forfeited to the Corporation. If the information so furnished shall be found to be untrue or false during the currency of the contract the Tenderer shall be held to be in-default and the contract if any awarded to him shall be liable to be terminated with its consequences.

13.0 TIME OF COMPLETION


The period of completion of Works is enumerated under Schedule 'A'. The time of completion shall commence from the date of placing the Work Order or date of handing over the site whichever is earlier. The completion period is for all items of Work in all parts of Tender Documents.

14.0 SCHEDULE OF RATES AND QUANTITIES

14.1 The Tender has been drafted on the basis of pre-priced schedule of rates and quantities for different types of items.

14.2 All the tender items are priced as mentioned in Schedule B of Tender in case of item rate / percentage rate contract.

14.3 The Contractors are expected to work out their own rates based on the detailed technical

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specifications, drawings & conditions and finally arrive at the cost of the Work in the appropriate places. The contractor shall insert his Lump sum Cost in the Billing Schedule.

The Successful Bidder will have to submit the rate analysis of all major items, if called for.

14.4 In case of Lump Sum Contract, Tenderer should insert his Lump Sum cost as contract value for the Work.

15.0 INSPECTION OF SITE AND SUFFICIENCY OF TENDER

15.1 The Contractor shall inspect and examine the site and its surrounding and shall satisfy himself before submitting his Tender as to the nature of the ground and subsoil (so far as is practicable), the form and nature of the site, the quantities and nature of the Work and materials necessary for the completion of the Works and means of access to the site, the accommodation he may require and in general, shall himself obtain all necessary information as to risk, contingencies and other circumstances which may influence or affect his Tender.

15.2 The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his Tender for the Works and of the rates and prices quoted in the schedule of Works/items/ quantities or in bill of quantities / employers requirements, which rates and prices shall, except as otherwise provided, cover all his obligations under the contract and all matters and things necessary for proper completion and maintenance of the Works.

15.3 No extra charges consequent on any misunderstanding or otherwise shall be allowed.

16.0 MANNER OF SUBMISSION OF TENDER

16.1 The Complete Tenders (Estimated amount below Rs. 25 lakhs) in the manner specified in the following paragraph will be received in any of the following offices / manner:


- a) Inward-Outward Section, Ground Floor, Navi Mumbai Municipal Corporation, CBD Head Office.
- b) By courier or by mail within specified time, as indicated above.

The tenders estimated cost above Rs. 25 lakhs should be submitted online at website (www.nmmc.etenders.in) & www.nmmc.gov.in

16.2 Telex, cable or facsimile offers will be rejected.

17.0 LAST DATE FOR SUBMISSION

17.1 Sealed Tender offers shall be received at the address specified above not later than the time and date specified in the Schedule 'A' of the Tender.

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17.2 In the event of the specified date for the submission of Tender offers being declared a holiday, the offers will be received up to the appointed time on the next working day.

17.3 The Corporation may, at its discretion, extend this deadline for submission of offers by amending the Tender Documents, in which case all rights and obligations of the Corporation and Tenderer will thereafter be subject to the deadline as extended.

17.4 Any Tender offer received by the Corporation after the deadline for submission of Tender offer prescribed by the Corporation, pursuant to the clause above, will be rejected and / or returned unopened to the Tenderer.

18.0 MODIFICATION AND WITHDRAWAL OF OFFERS

The contractor may modify or withdraw his offer after its submission, provided that written notice of the modification or withdrawal is received by the Corporation prior to the closing date and time prescribed for submission of offers. No offer can be modified by the contractor, subsequent to the closing date and time for submission of offers.

19.0 CONTENTS

19.1 Online Tenders are invited in two envelope system. The completed Tender shall be submitted in sealed envelope, super scribing the name of Work & C.A. No mentioned in the Tender notice.


19.2 Full name and address of the Tenderer shall be written in the bottom left corner of each envelope.

19.3 The envelope shall contain the following

Envelope No.1 (Technical Bid):

This should contain all the documents mentioned below. This Envelope may contain other documents also such as Technical bids, drawings, etc. as mentioned in the Tender notice.

- a) List of all the documents enclosed in the envelope.
- b) The tender price receipt (where it is downloaded from the official website.)
- c) Undertaking in 'Annexure 2' duly signed by a person holding a valid Power of Attorney.
- d) Power of Attorney (On Rs. 500 Stamp Paper) for authorized the person to sign the Tender Document (see clause 20(e)).
- e) The receipt of EMD (as per clause 6.0 above) or valid certificate of exemption issued by the City Engineer of Navi Mumbai Municipal Corporation.

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- f) Attested copy of the valid registration certificate (as requested by the eligibility condition at Annexure 'A')
- g) Up-to-date valid clearance Certificates for income tax, GST, Cess/LBT with NMMC.
- h) Details of firms in Annexure 3.
- i) The Tenderer shall furnish a statement showing the type and magnitude of work done with last 3 years as per Annexure 4.
- j) List of works in hand as on the date of submission of this tender. (Annexure-5)
- k) List of works in tenderer as on the date of submission of this tender (Annexure 6).
- l) List of machinery and plant immediately available with the Tenderer for use on his work and list of machinery proposed to be utilized on this work but not immediately available and the manner in which it is proposed to be procured in (Annexure 7).
- m) Details of Technical personnel's available with the contractor in (Annexure 8) with valid certificates.
- n) Affidavit on a non-judicial Stamp paper of Rs.500/- and Affidavit regarding the false documents on Rs.100/- Stamp Paper in the prescribed format attached herewith.
- o) Details of litigation history along with all supporting documents.
- p) Last 5 years certified and audited Turn Over AND Net Worth certificate issued by Chartered Accountant (CA).

Envelope No.-2

For tender amount below Rs. 25 lakhs (Financial bid) - This envelope shall contain the Complete set of Tender Documents along with corrigendum, addendum if any issued, duly filled in and initial on each page and signed by the Tenderer(s) at prescribed places of the Tender Documents, including signature of witnesses. (Un-conditional).


For tender amount above Rs. 25 lakhs: **e-submission only.**

Covering Envelope

Both the envelopes I & II shall be put together in common sealed envelope subscribing on it, name of Work, C.A.NO., Name and address of the Tenderer.

20.0 IMPORTANT POINTS TO BE NOTED BY THE TENDERER

- a) On receipt of blank Tender form the Tenderer should ensure that no corrections or over

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writings or erasures are left to be attested by the competent authority of the Corporation.

- b) The price-bid shall be inclusive of all taxes, Local taxes, etc. to be paid by the Tenderer for the Work and claim for extra payment on any such account shall not be entertained.

Any change that will be made in the Tender paper by the competent authority after issue of the Tender will be intimated to the Tenderer in the form of Corrigendum/Addendum for incorporating the same in the Tender before submitting the Tender.

- c) Price-bid should be written both in words and figures in the Billing Schedule, at appropriate place.

- d) No alterations and additions anywhere in the Tender Document are permitted. If any of these are found, the Tender may be summarily rejected. The Tenderer should get his doubts cleared during pre-bid meeting only if provided in the Tender. In case no pre-bid meeting is to be held the Tenderer should seek clarification or any doubt in writing 7 days before the last date for receipt of Tenders.


- e) In case of firm, each partner or power of attorney holder shall sign the Tender and the signatures shall be attested as witness by a reputed person in the space provided for the purpose. The attested copies of power of attorney of person signing the Tender shall be enclosed with the Tender. The power of attorney shall be signed by all partners.

In case of private limited/public limited companies, the power of attorney shall be supported by Board resolutions and appropriate and adequate evidence in support of the same shall be given.

- f) All pages and pasted slips should be signed by the Tenderer.

- g) No page shall be added or removed from the set of Tender Document.

- h) Tenderer shall be deemed to have studied the Employers requirement, all plans, specifications, terms and conditions, shall inspect and examine the site and its surrounding and shall satisfy himself before submitting his Tender as to the nature of the ground and subsoil (so far as is practicable), the form and nature of the site, nature of the Work and materials necessary for the completion of the Works and means of access to the site, the accommodation he may require and in general shall himself obtain all necessary information as to risk, contingencies,

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obligations under the Contract and all matter and things necessary for proper completion and maintenance of the Works. No extra charges consequent on any misunderstanding. A declaration and an undertaking to this effect should be signed by the Tenderer in the form attached at an Annexure - 2.

- i) The Tenderer shall submit the Tender which satisfies each and every condition laid down in this Tender notice, failing which the Tender will be liable to be rejected conditional Tenders will be rejected.

21.0 CORRUPT OR FRAUDULENT PRACTICES


The Corporation requires that the bidders/suppliers/ Contractors under this Tender observe the highest standards of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Corporation defines for the purposes of this provision, the terms set forth as follows:

- a) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of the public official in the procurement process or in contract execution; and
- b) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or an execution of a contract to the detriment of the Corporation, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Corporation of the benefits of the free and open competition.

The Corporation will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question; The Corporation will a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt and fraudulent practices in competing for, or in executing, a contract.

22.0 MANNER OF OPENING OF TENDER

For the work of Rs. 03 lakhs below, The Tender received within the schedule time and date specified in the Tender Notice will be opened as per the specified program in the office as mentioned in the Tender Notice (If Possible). The tenders will be opened in the presence of Tenderers or their authorized representatives who choose to remain present.

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For the Work of Rs. 03 lakhs above, tender will be open online in the presence of Tender Committee and e-tendering Administrator.

23.0 PROCESS TO BE CONFIDENTIAL

Information relating to the examination, clarification, evaluation and comparison of bids and the award of a Contract shall not be disclosed to Bidders or any other person not officially concerned with such process until the award to the successful Bidder has been announced.

24.0 PRELIMINARY SCRUTINY

The Corporation will scrutinize the offers to determine whether they are complete, whether any errors have been made, whether required technical documentation have been furnished, whether the documents have been properly signed, and whether the offers are generally in order.

Prior to the detailed evaluation, the Corporation will determine the substantial responsiveness of each offer to the Tender Documents. For purposes of these Clauses, a substantially responsive bid is one that confirms to all the terms and conditions of the Tender Documents without material deviations. The Corporation's determination of an offer's responsiveness is to be based on the contents of the Tender offer itself without recourse to extrinsic evidence.


A Tender offer determined as not substantially responsive will be rejected by the Corporation and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

The Corporation may waive any minor infirmity or irregularity in a Tender offer, which does not constitute a material deviation. This shall be binding on all Tenderers and the Corporation reserves the right of such waivers.

25.0 CLARIFICATION OF OFFERS

To assist in the scrutiny, evaluation and comparison of offers, the Corporation may, at its discretion, ask some or all vendors for technical clarification of their offer. The request for such clarifications and the response shall be in writing. To speed up the Tender process, the Corporation, at its discretion, may ask for any technical clarification to be submitted by means of facsimile/email by the Tenderer. In such cases, original copy of the document describing the technical clarifications must be sent to the Corporation by means of courier / in person.

26.0 REJECTION OF TENDERS

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The Tenders are liable to be rejected if the Tenderer,

- Does not submit price of Tender in the form of original cash receipt.
- Does not submit EMD.
- Does not submit Undertaking on Rs.500/- stamp paper. (Annexure-2) or incomplete undertaking or any change (s) made in the prescribed format.
- Does not disclose the full names, address and email/contact no. of all his partners in case of a Partnership Concern.
- Does not submit the information as called for in Annexure (3 to 8)
- Does not submit affidavit on Rs. 500/- Stamp Paper. (Annexure - 9) or incomplete undertaking or any change (s) made in the prescribed format.
- Does not submit Affidavit regarding true documents on Rs.100/- stamp paper or incomplete affidavit or any change(s) made in the prescribed format. (Annexure - 10)
- Fails to initial corrections.
- Fails to fill completely all the proforma provided in the Tender including proforma of submission of Tender and percentage and amount.
- Tries to contact the Corporation on any matter relating to its bid or tries to influence the Corporation in its decision on bid evaluation, bid comparison or Contract award from the time of the bid opening to the time of contract is awarded.
- Stipulates any condition in the Tender.
- Stipulates the validity period less than what is stated in the form of Tender.
- Does not quote rates inclusive of octroi duty and other terminal or Sales Tax or General taxes, etc.
- Does not sign every page of Tender with seal of company / firm.
- Does not submit the litigation / backlisting history along with all supporting documents.
- **Not fulfilling all conditions mentioned in schedule A .**

27.0 SHORT – LISTING OF VENDORS


The Corporation will short-list technically qualifying contractors and commercial offers of only these contractors will be opened at the date and time to be intimated.

28.0 OPENING OF COMMERCIAL OFFERS

The Corporation shall notify the date of opening of the commercial bids to all the Tenderers. On such notified date the Envelope No. 2 will be opened, and the amount mentioned in Tender format shall then be read out.

29.0 ACCEPTANCE OF TENDER

29.1 Acceptance of Tender on behalf of the Corporation shall be done by an officer(s) to whom the

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powers are delegated by the Municipal Commissioner.

- 29.2 The Corporation is not bound to accept the lowest or any tender. The Corporation reserves the right to reject any or all Tenders received without assigning any reason whatsoever.

30.0 INTIMATION TO SUCESSFUL TENDERERS

The acceptance of Tender may be communicated to the successful Tenderer in writing or otherwise either by the Tender opening Authority or any Authority in the Corporation.

31.0 SECURITY DEPOSIT

The Contractor shall pay a Security Deposit equal to 1% (one percent) of the contract sum as security for due fulfillment of the contract, unless otherwise stated in the Tender Documents.

The mode of making this deposit is as under.

a) Initial or contract deposit.

A sum, which along with the Earnest Money already paid, amounts to 0.5% of the contract sum shall be paid within 10 days after receipt of intimation in writing of acceptance of Tender.

It is optional to the Contractor to make the contract deposit in any one of the following ways:


- i) Wholly in form of National Saving Certificate pledged in favour of the Corporation or Bank Guarantees / Fixed deposit from Nationalized / Scheduled Banks in the enclosed format.

b) Retention Money:

The remaining amount of the Security Deposit i.e. 0.50% shall be recovered from the Contractor's running bills at the rate of five percent and such retention together with the contract deposit made as aforesaid shall not exceed in the aggregate 1% (one percent) of the contract sum after which such retention will cease.

- c) All compensation or other sums of money payable by the Contractor under the terms of this contract or any other account whatsoever, may be deducted from or paid by the sale of a sufficient part of this Security Deposit/retention money or from the interest arising therefrom or from any sums which may be due or may become due to the Contractor by the Corporation on any account whatsoever, and in the event of his Security Deposit/retention money being reduced by reason of any such deduction or sale as aforesaid, the Contractor shall within 15 days of receipt of notice of demand from the City Engineer make good the deficit.

In the event of the said deposit having been made by the Contractor by delivery to the

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Corporation by the Guarantee of the Bankers of the Contractor, and of the Contractor under any of the provisions of this contract becoming subject to or liable for any penalty for damages liquidated or un-liquidated or of the said deposit becoming forfeited or any breach or failure or determination of contract, then, and in such case the amount of any such penalty or damages and the deposit so forfeited is not previously paid to the Municipal Commissioner, shall immediately on demand be paid by the said Bankers to Corporation and may be forfeited by the Municipal Commissioner under and in terms of the said Guarantee.

32.0 EXECUTION OF CONTRACT DOCUMENT

The successful Tenderer after furnishing Initial Security Deposit, is required to execute an Agreement in duplicate in the form attached with the Tender Documents on a stamp paper of proper value. The proper value at present is Rs. 500/-for Rs.10 Lakhs & Rs.100/-for every next 1 Lakh. The agreement should be signed within a month from the date of acceptance of the Tender. The Contract will be governed by the Contract agreement, the General Conditions of the Contract (G.C.C.), and the Special Conditions of the Contract and other documents as specified in the G.C.C.

33.0 STAMP DUTY, LEGAL AND STATUTORY CHARGES

It shall be incumbent on the successful Bidder to pay stamp duty for the Contract agreement, as applicable on the date of the execution.

34.0 LICENCES


The successful Tenderer should comply statutory instruction of contract labour & will be required to produce to the satisfaction of the City Engineer a valid contract labour license issued in his favour under the provision of the Contract Labour License (Regulation and Abolition) 1970, before starting the Work. On failure to do so, the acceptance of the Tender is liable to be withdrawn and also the Earnest Money is liable to be forfeited.

35.0 RIGHTS OF THE CORPORATION

The Corporation reserves the right to suitably increase/reduce the scope of Work put to this Tender. The right to split up the Work in two or more parts is reserved by the Corporation and also the right to award the Work to more than one agency is reserved.

36.0 INTERPRETATION OF THE CLAUSES IN THE TENDER DOCUMENT / CONTRACT DOCUMENT

In case of any ambiguity in the interpretation of any of the clauses in Tender Document or the


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Contract Document, interpretation of the clauses by the EIC shall be final and binding on all parties.


37.0 NOTICE TO FORM PART OF CONTRACT

Notice of Tender, Prebid minutes and CSD issued if any. shall form part of the contract.

38.0 The cost put to tender is excluding GST & Provisional sum.

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Section – I Employer's Requirements

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Preamble

Data provided here is tentative. Bidder is advised to ascertain accurate facts and details on his own with due diligence. Obligatory requirements given herein shall be followed scrupulously in design of the Structures and no deviation in obligatory requirements will be permitted and in case of any deviations, the tender/contract shall stand rejected.

Contractor's General Engineering, Procurement & Design Obligations

The Contractor shall be solely responsible for the Engineering, procurement, design and construction of all work and for all details of the works and the adequacy thereof. Contractor's responsibility shall not be in any way be diminished nor shall the Contractor's design approach be limited by the Employer's acceptance of the Contractor's guidance or recommendations as to engineering standards and design specifications or by Employer's approval, suggestions or recommendations on any aspect of the engineering or design. The work shall be carried out as per the design prepared by the bidder and approved by the Competent Authority. The Work shall also include shifting of utilities, removal of electric poles, cutting, removal and transplantation of trees, Mangrove cutting etc. Drawings attached in Vol IV of this Bid document are purely indicative for tender purpose only. However, the Contractor has to submit his own detailed design drawings for the said project based on his detailed investigations.

Inspection, Quality Assurance and Quality Audit


The Contractor shall permit access to the Employer, Engineer's Representative, or any other person authorized by the Employer to the Contractor's premises where the works will be performed and will use reasonable endeavors to secure Rights of Access to the premises of its Subcontractors where the works will be performed and allow him to:

- (a) audit the Contractor's quality assurance system and its application to the works, including manufacture, development and raw materials and components provision;
- (b) inspect all parts of the works to the extent reasonably practicable to ensure that their quality meets the specifications; and
- (c) Perform activities with respect to civil works such as, but not limited to, survey, installation, commissioning, acceptance and other Design & Construction and/or operational activities.

Each of the foregoing rights of access shall be conditional upon

- (i) Employer /ER giving Contractor reasonable notice,
- (ii) the Employer /ER accessing such premises in a manner that avoids disruption of the works that is being performed on such premises.

The Employer shall provide the name(s) of each such visitor prior to the visit. Any right of access shall not be construed as creating any obligation requiring the Contractor or its Subcontractors to disclose trade secrets or proprietary information. Further, such right of access may be conditioned on the execution of a confidentiality and non-disclosure agreement and/or subject to routine building or security rules, regulations or procedures.

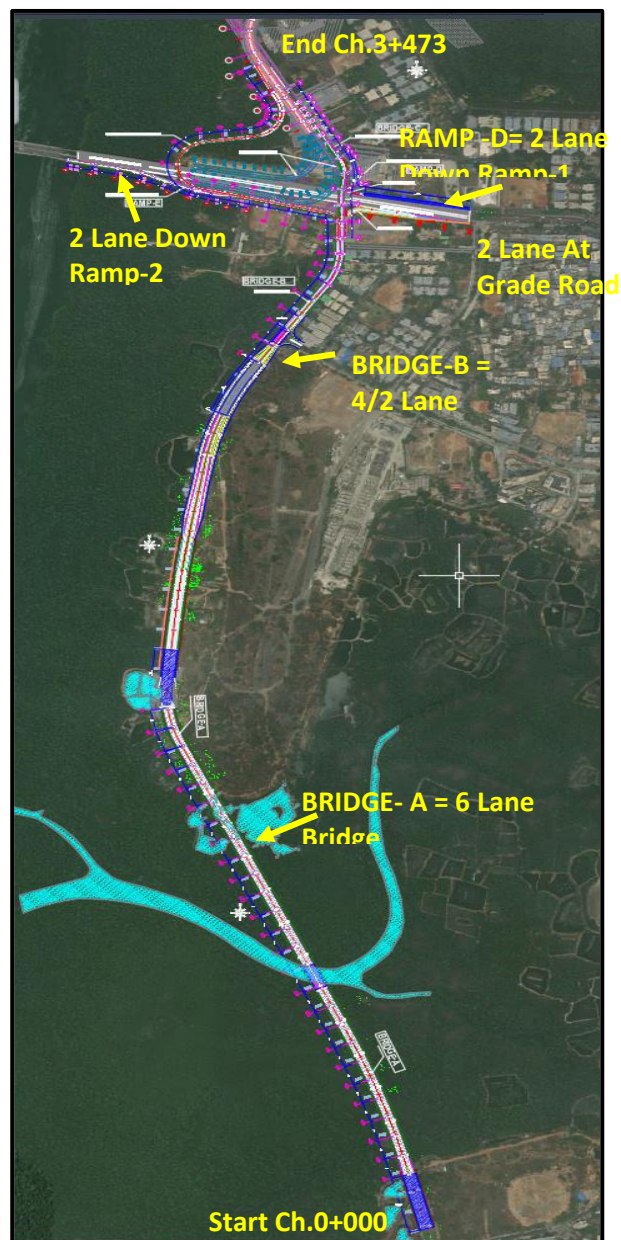
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1.1 INTRODUCTION

Airoli- Ghansoli Elevated Corridor is being planned by Navi Mumbai Municipal Corporation as a regional connectivity. NMMC invites a detailed Bid post-qualification basis for the **“Construction of Creek Bridge Connecting Ghansoli - Airoli along Palm Beach Road at Ghansoli, Navi Mumbai on EPC mode.**

1.2 SITE LOCATION & METEROLOGICAL DATA

Location of proposed project to be Designed & Constructed is as shown in Location Map given hereunder:-



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1.2.1 AREA, TERRAIN & GEOLOGY

Navi Mumbai Terrain is nearly plain with gentle slope. Entire work site is in a well-developed urban area. Traffic intensity on the existing roads is very high. The geology of the region is typical of the east coast i.e. clayey soil underlain by basalt rock formations.

1.2.2 TOPOGRAPHICAL DETAILS

The levels have been referred to in this document as applicable to the Project. However, Bidder should note that the actual levels will have to be used for determining the clearance and various levels in this document. The EGL/OGL levels are mentioned in the documents/ drawings are tentative. The actual levels are to be recorded jointly with Engineers Representative.

1.2.3 CLIMATE & ENVIRONMENT

Mumbai has a tropical climate, specifically a tropical wet and dry climate under the Koppen climate classification, with seven months of dryness and peak of rains in July. The cooler season from December to February is followed by the summer season from March to June. The period from June to about the end of September constitutes the south-west monsoon season, and October and November form the post-monsoon season.

Between June and September, the south west monsoon rains lash the city. Pre-monsoon showers are received in May. Occasionally, north-east monsoon showers occur in October and November. The maximum annual rainfall ever recorded was 3,452 mm (136 in) for 1954. The highest rainfall recorded in a single day was 944 mm (37 in) on 26 July 2005. The average total annual rainfall is 2,146.6 mm (85 in) for the Island City, and 2,457 mm (97 in) for the suburbs.


The average annual temperature is 27.2°C (81 °F), and the average annual precipitation is 2,167 mm (85 in). In the Island City, the average maximum temperature is 31.2°C (88 °F), while the average minimum temperature is 23.7°C (75 °F). In the suburbs, the daily mean maximum temperature range from 29.1°C (84 °F) to 33.3°C (92 °F), while the daily mean minimum temperature ranges from 16.3°C (61 °F) to 26.2°C (79 °F). The record high is 40.2°C (104 °F) on 28 March 1982, and the record low is 7.4°C (45 °F) on 27 January 1962.

1.3 BRIEF DESCRIPTION OF WORK

A set of drawings showing the arrangement of proposed main bridge/ramp arms contemplated by the Employer is given in Volume IV of Bid Document.

1. Proposed 6 lane Main Carriage at Ch. - 0+067 to Ch 0+000

The proposed 6 lane Main Carriageway Road on existing road total width of 30.80m including paved shoulder of 2.0m with concrete pavement (with utility duct) on both sides & median of 1.2m. Footpath cum drain of 2.30m shall be provided on either side of road. The width of Carriageway is 10.5m on either side & crash barrier to be provided. Tree plantation in Median shall be provided. The Details are shown in TCS drawings in Drawings volume.

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2. Proposed 6 lane main Carriageway at Ch.0+000 to 0+140 & Ch.1+405 to 1+550

The proposed 6 lane Main Carriageway Road on embankment with RE wall having total width of 31.80 m including paved shoulder of 2.0m (with utility duct) on both sides & median of 1.2 m. Footpath cum drain of 1.80m shall be provided on either side of road. The width of Carriageway is 10.5m on either side & crash barrier to be provided. Tree plantation in Median shall be provided. The Details are shown in TCS drawings in Drawings volume.

3. BRIDGE- A = 6 Lane Bridge (From Ch. 0+000 to Ch. 1+550)- (AP1-A to AP2-A)

The proposed 6 Lane main bridge starts near Gagangiri Maharaj Marg & ends crossing the Mangrove area towards Airoli. The Bridge comprises of 1265m of Elevated viaduct. The deck width of proposed bridge is 27.6m. The width increases in portion of viewing gallery at locations shown in GAD at every 100 mt. The standard span is 50 m precast PSC spine wing segmental box girder in view of ease of launching. Brackets for Utility shall be provided at 2 mt c/c on the web of the girders.

Obligatory Span of 1x55m+1x60m has been provided to cross the Creek water.


Sr. No.	Description	Qty. in Mt.	Remark
1	Length of Elevated viaduct	1265 (Ch. 140 to 1405)	Refer Drawing of Vol-IV.
2	Length of RE wall	140m (From Ch. 0 to 140) & 145m (From Ch. 1+405 to 1+550)	
3	Height clearance for traffic Movement	5.5m (min) at Road Crossing	
4	Span configuration	(9x50)+(1x55)+(1x60)+(14x50) (All spans PSC spine wing Box)	
5	Signage's & road marking etc.	Covers full length	

4. Proposed 6 lane main Carriageway at Ch.1+550 to 1+885

The proposed 6 lane Main Carriageway Road on embankment with RE wall having total width of 31.80 m including paved shoulder of 2.0m on both sides & median of 1.20 m. Footpath cum drain of 1.80m shall be provided on either side of road. The width of Carriageway is 10.5m on either side & 'W' Beam crash barrier shall be provided. Tree plantation in Median and footpath shall be provided. The Details are shown in TCS drawings in Drawings volume.

5. Proposed 6 lane Main Carriageway with Slip Road at Ch 1+885 to 2+150

The proposed 6 lane Main Carriageway along with slip road on embankment (Merging portion of 6 lanes to 4 lanes) having width in between 31.80 m to 34.0 m with varying median width. Footpath cum drain of 1.50m on either side shall be provided. The width of Carriageway varies in between 31.80m to 34.0m on either side. Tree plantation in Median shall be provided. The Details are shown in TCS drawings in Drawings volume.

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6. Proposed 4 lane Main Carriageway with Slip Road at Ch 2+150 to 2+298

The proposed 4 lane Main Carriageway on embankment with RE wall having total width of 17.2 m with median of 1.2m. The width of Carriageway is 7.50 m includes shyness on either side & crash barrier to be proposed. The Slip Road of 6.5 m & 1.5m footpath cum drain on either side to be proposed. The Details are shown in TCS drawings in Drawings volume.

7. Proposed 2 lane Slip Road at Ch 2+298 to 2+500

The proposed slip road of 7.50 m wide along with 1.50m footpath cum drain on either side shall be provided. The Details are shown in TCS drawings in Drawings volume.


8. BRIDGE-B = 4/2 Lane Bridge (From Ch. 2+150 to Ch. 3+473)- (4 Lane P01-B to PP14-C/PP0-B) and (2 Lane PP14-C/PP9-B to P32-B)

The proposed Bridge starts 748m from the end of 6 lane Bridge & joins the under construction Airoli Katai Naka Bridge at the end towards Katai Naka. The bridge width comprises of 17.2m wide deck (catering 4-Lane) & 8.5m wide deck (catering 2-Lane). The Bridge comprises of 147 m of RE wall portion and 1175m of Elevated Viaduct.

The length of the 4-Lane stretch is 360m & standard span is kept as 50/40m precast PSC segmental box girder in view of ease of launching. Portal piers has to be provided at certain locations in view of center line of alignment away from the median at the existing road below.

The remaining 2-Lane stretch is 815m long & standard span is kept as 40m precast PSC segmental box girder. Steel Composite span of 25m has to be provided at the proposed Airoli Katai Naka Bridge crossing. Similarly, Steel Composite span of 40m has to be provided on Existing Mulund Airoli Bridge crossing. For spans in sharp curve, steel composite span of 35/40m or Precast PSC I-girder of 25m has to be provided.

Sr. No.	Description	Qty. in Mt.	Remark
1	Length of structure	1175 (Ch. 2+298 to Ch. 3+473)	Refer Drawing of Vol-IV.
2	Length of RE wall	147m (From Ch. 2+151 to Ch. 2+298)	
3	Height clearance for traffic Movement.	5.5m (min) at Road Crossing	
4	Span configuration for 4 lane structure.	4Lane- (2x50)+(1x40)+(2x50)+(3x40) (PSC Box Girder) = 360 M	
	Span configuration for 2 lane structure. (5 Span in Structural Steel)	2Lane- 1x40(PSC Box)+1x35(Steel Composite) +(1x35)+(6x40) PSC BG +(1x25) (Steel Composite) +(3x40) (Steel Composite)+ (3x40)+(5x25)PSC BG+ (1x35)+(1x40) PSC BG = 815M	
5	Signage's & road marking etc.	Covers full length	

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9. BRIDGE – C 2 Lane Bridge (From Ch. 0+000 to Ch. 0+401.50) –(PP1-C to PP14C/PP9-B)

The proposed 2 lane bridge starts from Katai Naka side & merges with 4/2 Lane Bridge. The bridge comprises of 401.5m of Elevated Viaduct. The bridge has 8.5m wide deck. The standard span is kept as 40 m Precast PSC segmental box girder. However, provision of 17.5m/22.5m of PSC I-girder superstructure over portal piers has been kept near the Horizon School/private Residential building in view of alignment away from the median & to avoid the school/private building boundary. Additionally, 45m & 41.5m spans (Precast PSC segmental box girder) has been provided at the crossing of Existing Signia Water front road & Proposed At Grade road below respectively. Steel Composite span of 61.00 mt to be provided to existing Airoli Mulund Road Crossing.


Sr. No.	Description	Qty. in Mt.	Remark
1	Length of structure	401.5	Refer Drawing of Vol-IV.
2	Length of RE wall	0	
3	Height clearance for traffic Movement	5.5m (min) at Road Crossing	
4	Span configuration. (1 Span in Structural Steel)	(1x40)PSC I +(4x17.5) +(2x22.5)PSC I +(1x24)PSC I +(1x61)Steel Composite +(2x40)+(1x41.5)+(1x40) PSC BG = 401.5	
5	Signage's & road marking etc.	Covers full length	

10. RAMP –D = 2 Lane Down Ramp-1 (From Ch. 0+180 to Ch. 0+531)- (PP1-D/PP9-C to P04-D)

The proposed 2 lane Down Ramp-1 towards Airoli takes off from 2 lane Bridge & ends towards Airoli side (Diva koliwada circle). The bridge comprises of 215m of RE wall portion and 136m of Elevated Viaduct. The bridge comprises of 1x61+1x40+1x35m span configuration.

The deck is 7.0m wide. The 15m span is of PSC I-girder, while Curved spans of 40m/35m span is kept of steel composite girders.

Sr. No.	Description	Qty. in Mt.	Remark
1	Length of structure	136 (0+180 to 0+316)	Refer Drawing of Vol-IV.
2	Length of RE wall	215m (From Ch.0+316 to Ch.0+531)	
3	Height clearance for traffic Movement	5.5m (min) at Road Crossing	
4	Span configuration (All 3 Span are in Structural Steel)	1x61 (Steel Composite) +1x40 (Steel Composite) + 1x35 (Steel Composite) = 136M.	
5	Signage's & road marking etc.	Covers full length	

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11. RAMP E -2 Lane Down Ramp-2 (From Ch. 2+901 to Ch. 3+261)- (P01-E to P09-E)

Proposed 2 lane Down Ramp-2 towards Mulund side takes off from proposed 4/2 Lane Bridge & merges with the Existing -Airoli- Mulund Bridge. The bridge comprises of 360 m of Elevated Viaduct. The span configuration of 1x25+1x40+1x45+5x50 of the Ramp has been kept in line with the existing piers of the Airoli - Mulund Bridge. The bridge has 8.5m wide deck.

Sr. No.	Description	Qty. in Mt.	Remark
1	Length of structure	360	Refer Drawing of Vol-IV.
2	Length of RE wall	0	
3	Height clearance for traffic Movement	5.5m (min) at Road Crossing	
4	Span configuration	(1x25)+(1x40)+(1x45)+(5x50) (All spans PSC Box)	
5	Signage's & road marking etc.	Covers full length	


12. RAMP F- Proposed 2 Lane At Grade road from Existing Airoli Mulund road towards Ghansoli at Ch 0+000 to 0+558

2 lanes at grade road for traffic coming from Diva koliwada junction to Ghansoli having length of 558 m. is proposed. The width of carriageway is 7.50m. along with footpath on either side of at grade road & the RCC drain at inner side of road shall be provided. The Details shown in TCS drawings in Drawings volume.

The typical cross sections of the proposed corridor are given in Vol-IV, Tender Drawings. Sufficient side drainage and cross drainage structures shall be provided to cater for surface runoff. Also, provisions have to be made towards lighting of bridge & approaches etc. as defined in Bid Document. Appropriate provisions shall be made for carrying electric cables, water pipe line etc. in Bridge structure and in Concrete pavement of the project. Appropriate pavement marking shall be provided as per relevant standards.

The Contractor shall carryout engineering surveys, investigations and detailed engineering designs. The Contractor shall prepare the working drawings for all the components relevant to the Project for implementation and to fulfill the scope of the Project as envisaged. The design for different project facilities will follow the locations and indicative designs given and shall comply with design criteria, technical specifications and standards. All designs shall be checked by the Engineers Representative before submission to IIT for further review and approval before execution.

The entire project length is to be electrified with street lights as approved by Engineer and provision for CCTV needs to be done at all entry and exit points of the project along with Speed

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camera at various points as required.

1.4 SCOPE OF WORK


1.4.1 General

Utility identified and shifting includes identification of telecom, OFC, electric cables, MGL, water supply & sewer pipelines etc under the ground and their shifting and diversion as needed.

The existing footpath/median will require a partial/fully dismantling which shall be reinstated without any cost implication to the client.


1.4.2 For The Bridge Portion

- i. Fabrication, erection & shifting of M.S, barricading as per drawing including painting with- enamel paint & lettering as directed. Contractor has to barricade entire area of bridge including ramps on both sides of bridge as directed by engineer in charge.
- ii. Bidders should own/hired RMC plant of minimum 60 cum/hr capacity, within 30Km radius of work site location.
- iii. Taking confirmative trial bores, conducting sub-soil investigations at each foundation location of pier, abutment and at locations of R. E. Walls and all embankment portions. Taking trial pits on approaches including collecting samples, submitting photographs of core boxes to the engineer's representative, conducting tests and submitting geotechnical investigation report in quadruplicate from geotechnical expert and recommendation of safe bearing capacity, settlement etc. at each foundation location & obtaining approval of the Engineer.
- iv. Topographical survey using total station. Maintaining two total station and 2 qualified surveyors till completion of the work.
- v. Submission of methodology of each activity, safety manual, Quality Assurance Manual & obtaining approval of the engineer.
- vi. Presentation to the employer including general arrangement, methodology of construction, design philosophy, aesthetics of entire structure etc. obtaining approvals of local authorities & NMMC to various components of the works.
- vii. Preparing structural design and drawings for bridge structure, its approaches, valley curves on both sides of bridge, Reinforced Earth work and obtaining approval of the engineer including getting the same proof checked from the consultants appointed by NMMC. The design of all components of the project shall also be proof checked from IIT Mumbai after proof checking of the same from PMC. The Fees of proof checking consultancy from IIT Mumbai shall be borne by consultant appointed by NMMC.
- viii. Identification, Mapping and relocation of all visible & underground utilities. Preparing existing utilities plan.
- ix. Construction of bridge including RE wall including friction slab, anti-crash barriers, PQC on solid ramps & approach road, wearing coat on bridge, specified painting to all components

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of bridge and RES/RCC retaining walls, providing noise barriers etc. as per the contract, as per approved drawings & design criteria.


- x. Construction of RCC substructure piers, abutments, pier caps, construction of R.E. Walls with RCC panels, RCC retaining walls, and protection for piers of obligatory span shall be as per approved design and drawings.
- xi. Construction of superstructure girders (precast PSC box girders, PSC I girders/Composite steel girders) & RCC deck slab, construction of viewing gallery.
- xii. Providing & fixing POT/PTFE/ Spherical bearings as per designs & specifications.
- xiii. Casting anti-crash barrier as per the design and drawings.
- xiv. Providing & fixing strip Seal/ Modular expansion joints as per approved design & drawings.
- xv. Providing bituminous wearing course as described in drawing for bridge. Wearing course shall be 50 mm DBM + 25mm Mastic +6 mm water proofing membrane. Design & construction of solid approach ramps with RCC panels, RCC retaining walls, and
- xvi. Reinforced earth work, friction slab, anti-crash barrier, drainage arrangement as shown in tender drawings.
- xvii. Storm Water on carriageway of bridge shall be collected through down take pipes/sprinklers at ground at each pier location.
- xviii. Drip irrigation arrangement shall be provided for the plants in median and footpath location.
- xix. Providing & applying road marking, Arrows, Ramblers, Zebra crossing etc. using Thermoplastic paint and Chevron marking on inner face of Anti crash barrier etc. as per MORTH specifications.
- xx. Preparing detail drawings and Providing Road signage's boards viz: Mandatory, Cautionary, Informatory boards, Raised Median marker, Cat eyes/Road studs 5 m c/c, and Bollards etc. for each bridge and service/slip road. The drawing for the same shall be got approved from the Engineer/PMC.
- xxi. Providing & fixing of weep holes, water spouts, gratings, horizontal & vertical down take PVC pipes/sprinklers to drain out water from bridge.
- xxii. Anti-carbonation, anti-dust, anti-fungal acrylic paint to entire exposed surface of super structure & bottom of deck slab, piers, pier caps, abutments and RE panels etc. as per approved aesthetic colour in 3 coats and as directed by the engineer. Cement paint in 3 coats to all inner closed surface of box girder.
- xxiii. Fusion bonded epoxy coating/galvanization to steel reinforcement shall be provided to all grade of concrete.
- xxiv. Kerb stones shall be provided parallel to the RE wall at a distance of 500 mm away from the RE wall, to protect it from damages and to channelize the traffic running on side roads. The gap between the kerb & RE wall shall be filled up with sand and covered with interlocking blocks.
- xxv. Enamel paint for all kerbs/ kerb stones as per approved aesthetic colour in 3 coats and as directed by the engineer.

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- xxvi. 6 mm thick M.S. liner shall be provided to the piles from the bottom of pile cap up to rock level/open footing.
- xxvii. Coal tar epoxy paint in 2 coats with one coat of zinc rich primer (Total dry film thickness $50+80+80=210$ microns) to outer surface of buried concrete or concrete surface in contact with earth/soil and for outer surface of MS liners of pile foundations. Part of Substructure in contact with earth and up to (H.T.L. +0.9m) / H.F.L. (whichever is higher) – One coat of primer and two coats of Coal Tar Epoxy. Aluminum based paints shall be prohibited as they have deleterious influence on the concrete surface.
- xxviii. Rectification of trenches excavated for open foundation of piers, abutments, pile caps, retaining structure etc. as per specification.
- xxix. Ancillary work such as Reinstating Road Surface including paver blocks, kerbs, medians etc. when disturbed during the construction shall be reinstated as per the direction of the Authority Engineer at no cost to client.
- xxx. Contractor has to submit proper methodology for construction of foundations, substructures & superstructures with properly designed centering and shuttering & launching scheme and to get approval from the Engineer.
- xxxi. A detailed plan for shifting of utilities with name of agencies & methodology for shifting/relocation shall be submitted.
- xxxii. Electrification work including cables, electric poles, light fittings taking power connection from electricity authority, providing meter installing, commissioning transformer, feeder pillars etc. shall be done as per specifications.
- xxxiii. Providing and installation of flamingo shape SS murals with arrangement for light fitting and light fitting, cables, panel etc. complete as shown in Drawing volume.
- xxxiv. Lighting below & above bridge shall be carried out with proper fittings and illumination.
- xxxv. Submission of “As-built” drawings, Maintenance Manual after completion, Construction Manual, Quality Assurance Manual, Standard formats for test report, items wise methodology for entire work during construction.
- xxxvi. Periodic inspection of work with the employer during DLP shall attend to the defects if any and shall submit compliance report.
- xxxvii. The Span arrangement shown in Drawings are Mandatory only for obligatory spans and can be changed for other spans.
- xxxviii. Main Bridge and ramps shall be provided with good quality painting to enhance the aesthetic look of the proposed structure.
- xxxix. The work includes the cutting and transplantation of Trees / Mangroves including obtaining statutory approvals. Shifting of electrical poles and cables. The cost is included in the project cost, no additional cost will be imposed to the Client.

1.4.3 Specific Requirements

For the guidance of the tenderers, GAD showing arrangement of the bridge as contemplated by the employer is enclosed. However, the tender is to be awarded on the contractor's own design

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(Lump sum cost Basis on Bidders own designs) complying with various requirements indicated in Design data, Scope of work, as well as in the chapter of design criteria for bridges in of the tender and other relevant provisions of the contract. For this purpose, details shown in typical GAD's enclosed are to be taken as indicative and need not be adopted in Toto, except certain obligatory requirements which have been specified. These details also specify minimum vertical and horizontal clearance at crossing / junction etc. minimum length & width of bridge, minimum acceptable mix, specifications and sizes for different components. The Contractor's design shall provide for comparable specifications and in any case not inferior to those corresponding components contemplated by the Employer. The alignment of bridge has been shown in tender drawings. After carrying out detailed topographical survey, the contractor shall mark the alignment on the site & get approval from the engineer. The engineer may direct the contractor to modify the alignment as per the site conditions which contractor shall follow without extra cost to the employer. Permanent survey pillars shall be erected on the ground on both sides of approved alignment and shall be preserved till the end of construction.

Type of foundations shown in Tender Drawings (Vol-IV) are indicative only, bidder has to do his own investigation / assessment to decide the type of foundation to be adopted.

1.4.4 Appointment of experts:

Contractor has to appoint following experts on the work with the approval of the engineer. Provision of appointment of experts is incidental to the work & no separate payment will be made to the contractor.


i) Geotechnical Expert:

Geotechnical expert shall decide founding levels & SBC of strata of each foundation of bridge & its approaches and approve each founding strata. The design of solid ramps by geo-technical expert is included in the scope of the contract. He shall also oversee preparation & Submission of sub-soil Investigation report.

ii) Structural Bridge Engineer:

Immediately after receipt of work order, the contractor shall send the proposal of appointment of structural design engineer/Design consultant to the client. Minimum criteria for appointment shall be: -

- a) He shall be qualified preferably M. Tech/M.E. (Structures) with a minimum experience of 15 years in the field of structural designs.
Structural Engineer/Design consultant shall have designed at least five bridge projects of similar kind.
- b) The duties of structural engineer/Design Consultant will be as under:
 - i) Within 15 days from the date of receipt of work order, he shall submit program for submission of detailed design & drawings to the engineer. The program shall be such that all designs of bridges & Road pavement shall be submitted for approval within

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3 months from the date of work order.

- ii) GAD for the proposed work shall be prepared by bridge structural engineer/Design Consultant. GAD shall be based on detailed topographical survey, geotechnical investigations & the same shall be commensurate generally with GAD in the tender.
- iii) The structural Engineer/Design Consultant shall prepare design basis report based on design criteria given in the tender. The design basis report shall include general information of bridge, salient features, loadings, combinations of loading, design parameters, material specification codes, specifications etc.
- iv) The detailed design calculations (Hard copy) in 2 sets & drawings in 4 sets shall be submitted by the structural engineer/Design Consultant to the engineer for initial approval. The engineer or proof consultant appointed by the engineer will scrutinize the design/ drawings and communicate his approval/ remarks within 15days from receipt of hard copy of design/ drawings by him. The structural engineers shall comply the remarks and send the modified corrected design/ drawings (10 copies) for final approval when initial approval is already given.
- v) Prepare design & drawings for temporary structure, staging, shuttering etc. & certify that the erected shuttering and staging is as per his design.
- vi) Prepare erection/ launching scheme including design calculation.
- vii) Prepare Launching methodology/ method statements for construction of all components of structures including temporary structures.
- viii) Prepare risk analysis statement at each stage of work.
- ix) First unit of every component with similar design of the bridge shall be strictly checked & certified by the bridge structural engineer/Design Consultant. Other units shall be checked by the bridge structural engineer/Design Consultant during periodic visit. He shall make at least 2 site visits per month and submit report to the Employer.

iii) Safety Expert:


Appointment of safety engineer possessing necessary certification in safety. He should have track record of working as a safety expert at bridge/ bridge site at least for 7 years. He shall visit the site at least once in a week and give report of his observations, suggestions to the Employer.

iv) Traffic Expert:

Traffic expert shall prepare traffic diversion plans and shall obtain approval of the Employer and Traffic police.

1.4.5 Earth retaining structure for ramps:

RCC panels, RCC retaining walls, reinforcement earth retaining structure with granular filling including friction slab & approach slab as shown in GAD. RCC retaining walls shall be provided where RE walls are not feasible at no extra cost.

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1.4.6 Sub-Soil Investigation:

Contractor has to take trial bores at each foundation locations, retaining walls/ R. E. Walls and cores are to be preserved in boxes and all required tests are to be conducted including geotechnical report from the expert. The geotechnical investigations shall be completed before submission of design & drawings for approval. Contractor has to submit the photographs of core boxes of geotechnical investigations he has done on the site.

1.4.7 Foundations:

Suitable foundation may be adopted for, depending on the properties of the strata based on sub-soil investigation reports.

1.4.8 Sub-structure:

Providing sub-structure of piers, portal pier, abutments, returns as per design criteria with suitable RCC caps. NMMC logo shall be embossed in the concrete surface of each piercap on both the sides with 100% area in Reckli liners or equivalent to the shuttering. Along with numbers painted on the Piers.

1.4.9 Approaches. REW, Crust on Ramp:


- Providing Reinforced Earth retaining structure and earth work of approaches up to end of Valley curves as shown in drawing for bridge.
- Providing filter media behind concrete panel of R.E.W /Earth retaining structure.
- Providing RCC Anti crash barrier, friction slab, approach slab as per Tender drawing Providing minimum wearing course over super structure.
- Dense Bituminous Macadam with minimum 4.5% Bitumen Content including tack coat - 50 mm thick or as per design.
- Mastic asphalt. (Manually preferred) - 25 / 40 mm thick as per design
- Water proofing Membrane by bitumen sheet - 06 mm thick and for approaches including RE wall pavement PQC crust shall be provided.

1.4.10 Other appurtenances:

Providing POT/PTFE/Spherical bearings, pedestal for bearings, modular/ strip seal type expansion joints, wearing course, road kerbs, anti-crash barriers up to end of valley curve on either sides, RES protection kerbs on either sides of bridge and up to valley curve as shown in tender drawing. For bearings and expansion joints guarantee period shall be 20years from the date of issue of completion certificate.

1.4.11 Painting/ Anti-Corrosive treatment:

This shall be as per design criteria. Two coats of anti-carbonation paint including primerto anti-crash barrier & kerb in black & yellow strips, anti- carbonation, anti-dust, anti- fungal elastomeric paint in 2 coats over primer to all exposed surface of Box girders, diaphragms, bottom of slab, RCC piers anti crash barrier etc. Fusion bonded epoxy anti-corrosive treatment to reinforcement steel for the concrete used in substructure and superstructure of Bridge and

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RE-wall is obligatory.

1.4.12 Electrical fittings & fixtures:


Provision of 100 mm dia. HDPE pipes in Anti crash barrier for passing cables of electricity with suitable mild steel sleeves embedded in Anti crash barrier. All electrical poles, flamingo shape light poles and fitting accessories, taking connection & commissioning electric illumination as per the specifications & accepted by local competent authority/NMMC shall be provided & executed within lump sum cost of bridge.

1.4.13 Site office & Furniture:

Contractor shall provide and maintain a furnished site office for the supervisory staff of the Engineer. It shall have at least 100. Sqm. floor area Air – conditioner site office and shall include electrical lights, fans, computer point including proper wiring, water supply, drainage, toilets, tables, chairs, cupboards, telephone (Mobile phones) and shall be constructed at location directed by the Engineer and maintained for a period up to 6 months beyond date of completion as certified by Engineer. The site office with all services, furniture, fixtures shall be property of the contractor. Land for site office, field laboratory etc. is not available with NMMC and could not be provided by employer. All Electric & Telephone / Mobile bills will be paid by the contractor for entire period of contract and up to 6 months beyond completion of works and both the Electric & Telephone connections will be obtained by him In addition to above are exclusively furnished site measuring at least 25 sq.m floor area for NMMC staff and Engineer shall also be provided with above mentioned similar provision.

Minimum furniture for site office shall be 6 Godrej make tables of size 0.9 m x 1.5 m, 6 chairs and 3 Godrej cupboards of 1.92m height, three executive chairs, Ceiling fans & telephone facility with partition for executive staff of PMC and NMMC shall be provided by the contractor. Newly purchased Three number of PC's of configuration comprising (Processor – Intel i7 11th Gen Processor 11700F, Ram – 16GB 3200MHZ, 23" (1920 x 1080 pixels), 2TB Hard disk, DVD writer, 6-in-1 memory card reader, WLAD 802.11 b/g/n Bluetooth, Wireless keyboard and mouse, HDMI in / out support, USB, ESATA Ports, JBL speaker and colour desk Jet printer. Two Nos of A-3 size ink jet colour printer shall also be provided with two years of warranty. No separate payment shall be provided for the above as the above provisions are incidental to the work. Conference room with seating arrangement of 20 persons with video call facility with Smart TV cum projector shall be provided.

Temporary structures such as go down, Air- conditioned site office, field laboratory, labor camps etc. for proper execution of the project as also an office for the exclusive use of the Employer, Engineer and the Engineer's representative shall be constructed by the Contractor at his own cost and as per the prevailing rules and regulations of the government and local authority and after obtaining the permission of the concerned authorities. The Employer will not provide any land for this purpose and the same will have to be arranged by the Contractor. The temporary structures so constructed shall be dismantled and removed at the Contractor's


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cost within one month from the date of completion of the work. The Contractor shall also arrange two numbers of newly purchased A/C Vehicle (Ertiga or equalivent) at site for site visit, inspections by the Employer, Engineer and the Engineer's representative and shall be available till completion of the project. All vehicle expenses including registration, Petrol/ Diesel, maintenance, insurance, Driver etc. shall be borne by the contractor. The contractor shall provide site staff one clerk, two computer operator with English and Marathi typing and one peon to the Employer and cost of salary and other expenses on this staff shall be borne by the contractor.

Other features like traffic control and safety, environmental requirements, problem related with utility services, public awareness and relationship, clearance from statutory authorities. Contactor has to control the traffic by providing barricading of work area, regulate the traffic by engaging guide man, security guards and Marshal to guide and control the flow of traffic. No separate payment will be made for traffic control & regulation as same is incidental to work and included in lump-sum cost.

1.4.14 Electrical works

1. Where the scope under the present Contract covers providing and fixing electrical lighting / highmast , signals etc. the following items shall be conforming to relevant Indian Standards and good industrial practice.
2. Junction boxes, pullout boxes. The pull-out box shall be at either side of each junction box at crash barrier. The junction box and pull-out box together will be sufficient for easinglying of cables and further maintenance activities.
3. Sleeves, base plate and anchor bolt for fixing electrical poles / highmasts.
4. The HDPE pipes as specified elsewhere in the documents for cabling shall be as per the standard document. The pipes shall have free space of more than 40% after inserting the necessary runs of cables one in each deck slab crash barrier for entire length of the Box Viaduct and up to nearest junction box.
5. All the material shall be new and conform to latest IS Specification and shall be procured from approved manufacturer only.
6. Providing and fixing electrical poles along with complete fixtures and luminaries shall be such that the appropriate average lux levels as per relevant standards are maintained.
7. Providing and fixing flamingo shape electrical poles along with complete fixtures and luminaries shall be such that the appropriate average lux levels as per relevant standards are maintained.
8. The complete work as per scope of work defined elsewhere in this document shall be carried out in every respect in conformity with current rules & regulations of local electricity authority, relevant Indian Standard guidelines and the tender document under the supervision of qualified engineers/staff to be approved by the Engineer. The work shall be carried out to the satisfaction of the Engineer.
9. It shall be the responsibility of the contractor / bidder in any case to Design, supply, install,

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commission the system following all the requirements as per this document and the Standard documents referred to, in this document as per specified scope maintaining the lighting outputs.

1.4.15 Equipment's for field laboratory

The equipment's to be provided in the field laboratory shall be as per the provisions of the MORT&H Specifications (as per latest revision as on day). The equipment's shall be approved by the Engineer.

1.4.16 Documentation

1. The following items shall be deemed to be covered under the scope of work:
2. "As Built" drawings and design calculations in soft and hard copy shall be supplied by the Contractor free of cost
3. Five CDs of 80-minute duration covering the different phases of construction from start to finish of construction of viaduct shall be supplied by the Contractor free of cost. For this purpose, a complete script for filming shall be prepared and got approved from the Engineer and filming shall be done accordingly.
4. "Maintenance Manual" describing access arrangements, important obligatory precautions from the point of view of structural safety, and procedure for minor and major repairs of each component of the bridge, renewals of finishes and treatments periodically shall be supplied by the Contractor at his cost.
5. A "Quality Assurance Manual" covering all aspects of designs and drawings, mix- designs, materials, testing, soil and rock properties, statistical quality control, etc. shall be prepared by the Contractor free of cost well before starting the work.
6. A "Construction Manual" covering various aspects of construction methods, difficulties faced and how they were overcome during execution etc. Shall be supplied by the contractor free of cost at the time of finalization of work.
7. A "Safety Manual" covering various aspects of safety procedures to be adopted during the construction, traffic diversion etc. shall be prepared by the Contractor at his cost well before starting of the work.
8. Details of arrangement for street lighting and design calculations there of duly approved from Competent Authority is the responsibility of the Contractor.
9. Detailed design calculations and working drawings of all the component of the Viaduct including launching scheme and programme of launching shall be submitted well in advance of execution, in accordance with the above programme. Three sets of such detailed design calculations and drawings accompanied by complete information and sufficient data shall be submitted to the Engineer. The designs and drawings shall be submitted progressively. Only drawings will be approved and corrections to the designs shall be carried out as per requirement of approval for record. If computer is used for design or analysis, the Contractor shall submit with design and soft copy of design, the detailed description of method of

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analysis with explanatory notes and manually done sample calculations for adequate number of typical cases. The Computer Programme as submitted will be tested by comparison with solutions as worked examples.

10. Drawings and designs shall be in S.I. units. Calculations shall be neat and clear and supplemental by full explanatory notes and sketches wherever required. The drawing so initial submission and final approval shall be in Auto CAD and in A-size only.
11. If during the scrutiny of detailed design calculations and drawings, including temporary arrangements for launching, any changes there in are found necessary for compliance of specifications / design criteria in the opinion of Engineer, they shall be incorporated without altering the Lump-sum price quoted. It will be entirely the responsibility of the Contractor to submit properly prepared designs & drawings in reasonable time. The Competent Authority will approve them in 15 days' time after receipt of all compliances.
12. Schedule of reinforcement and the rate of reinforcement per cubic meter of concrete quantity (and also percentage with respect to gross cross-sectional area of the component) should also be shown on each drawing.
13. Eight sets at approved working drawing including one set on reproduction tracing film and 8 sets of approved design calculations shall then be supplied by the Contractor which will be formally authenticated by the Engineer (8 copies of drawings and one set of design calculations for field officers, one set to be returned to the Contractor and three to be retained by Engineer). These drawings shall be submitted in approved plastic folders and calculations in approved plastic files free of cost.
14. After completion of each stage of work, 3 sets of record plans and one set of final design calculations based on the work actually executed including one soft copy on CD compatible to latest window software, & Auto CAD latest version, shall be supplied by the contractor to the Engineer as directed.
15. Approval to drawings and design calculation by the Engineer shall not in any way relieve the contractor of his responsibility for the correctness, soundness, structural stability and safety of the structure.
16. The Contractor's designer or consultant shall attend all the review meetings conducted by Competent Authority from time to time without any extra cost and shall also remain present as and when required during the checking of designs.

1.4.17 Contractor's documents

Contractor's documents to be submitted to the Employer required to satisfy all Regulatory Approvals and data, information, design calculations (classical and software generated / use) along with any criteria for patent registered design etc. shall comprise of:

- (i) information collected during engineering such as data, bore logs, levels, instrumentation for ground improvements, etc.,
- (ii) design assumptions, calculations, software used and drawings good for construction,
- (iii) test procedures followed during construction and

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(iv) test after completion

(v) Quality Assurance Manual and Maintenance Manual

Documents shall be submitted to the Engineer for review. Engineer reserves the right to discuss and correct the design / calculations as per the requirements of national / international code of practice. Such changes if required to be carried out shall be at the cost of Contractor and no separate payment shall be entertained.

1.4.18 Raw material for construction purposes:

The contractor has to look for sources for procurement of suitable materials for the construction and shall be accounted for in his quoted price.

1.4.19 Casting Yard:

The contractor has to make his own arrangements with necessary permissions from competent authority for construction of casting yards. No separate payment will be made for casting yard. No land will be arranged /made available by NMMC for Casting Yard.

1.4.20 Schedule of Handing Over.


The site for construction will be handed over to the contractor in phase manner as per work program as soon as the work order is issued and made clear by local authority.

1.4.21 Specific conditions of maintenance.

The defects are to be attended to as soon as information is received from employer, NMMC/Consultants by the contractor. If contractor has not attended to the defects within a period of 15 days as decided by Engineer/owner, the same shall be got done by the owner at the risk and cost of the contractor without further notice.

Defects in electrical work due to any reason for poles, electric fitting, cables, and all other accessories like DP boxes, transformer etc., and other equipment's/ installations in work for entire Defect Liability period shall be maintained and repaired / replaced immediately without any extra cost. No payment will be made by employer for repair / replacement of electrification work as it is included in lump-sum cost works and individual items of Lump sum contract on Bidders own designs.


Defects in electrical work due to any reason including accidents, natural calamities etc for poles, electric fitting, cables, and all other accessories like DP boxes, transformer etc., and other equipment's / installation in work for entire contract shall be repaired /replaced immediately. The maximum incidents of such rectification repair and replacement shall be 3 times for each individual component /item /portion of work during defect liability period without any cost. No payment will be made by employer for repair replacement of electrification work as it is included in lump-sum cost for works and individual items of Lump sum contract on Bidders own designs.

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Summary of activities included in road work.

For the sake of convenience some of the activities are summarized but not limited to as below; -

- i) Installation of a steel barricade.
- ii) Deployment of Traffic Wardens.
- iii) Excavation for drain foundation, and roadway in **soft rock, hard rock, RCC , concrete, water bound macadam, wet mix macadam, asphalt mix wearing coat** of any type including shoring and etc. complete.
- iv) Levelling, **watering & rolling** the excavated road surface by vibratory roller
- v) Providing **earthwork in embankment** for road with approved materials
- vi) Providing and laying GSB, DLC & PQC/flexible for slip road.
- vii) Providing & Cutting bending hooking laying in position and tying Fusion bondedepoxy **HYSD steel bars** for all diameters of reinforcement as per detail drawing for RCC work.
- viii) Demolishing existing masonry, structures, (above & below GL).
- ix) Removing existing Electric pole, Overhead Gantry, Boards etc.in roadway.
- x) Demolishing Reinforced or pavement grade concrete M-20 & above by using modern machinery (Poclain with rock breaker, etc.)
- xi) P/L 200 mm dia. R.C.C. Hume pipes, NP2 class for drain inlet.
- xii) Dewatering by Pump.
- xiii) Removing existing Kerb stones/Paver blocks.
- xiv) Providing and fixing of cement concrete **Kerb Stone** of size: 500mm width x 325height x 165mm thick with one coat of primer and two coats of 1st grade road marking paint in the yellow/white/black or any shade.
- xv) Providing & applying road marking, Arrows, Ramblers, Zebra crossing etc. using thermoplastic road marking in white / yellow colour with primer coat (Tack coat) on Asphalt/CC road surface.
- xvi) Preparing detail drawings and providing **Road signage's boards** viz: Mandatory, Cautionary, Informatory boards, Cat eyes @ 5m c/c, and Bollards etc. for each roadwork. The drawing for the same shall be got approved from the Engineer/PMC.
- xvii) Supplying and fixing 0.90m x 0.60m internal size **rectangular C.I. airtight**

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hinged type cover and frame (weighing minimum 270 kg.)

- xviii) Providing weep holes in Brick masonry/Plain /Reinforced concrete abutment, wingwall/return wall with 100 mm dia PVC/ AC pipe.
- xix) Removing the paver blocks of any thickness, size & colour from carriage way or footpath & transporting the same.

1.5 DESIGN PARAMETERS AND DESIGN ELEMENTS (SUMMARISED).

Bridge has been proposed considering the need and importance of future traffic demand. Due consideration will have also to be given to the anticipated surrounding development along these links with due weightage for land, social, environment, aesthetic & economic issues. Standards for design of various components and for the bridge has been developed accordingly.

1.5.1 Foundations:

Based on the test results of geotechnical investigation, type of foundation shall be decided.

1.5.2 Sub-structure:

Providing sub-structure of piers, portal pier, abutments, returns as per design criteria with suitable RCC caps. NMMC logo shall be embossed on each pier cap on both the sides with 100% area in Reckli liners or equivalent to the shuttering.

1.5.3 Superstructure:


The standard span is 50 m precast PSC spine wing segmental box girder / 40 m Precast PSC segmental box girder in view of ease of launching.

Steel Composite Girder has been proposed at following location.

- Curved Span from PP10B to P11B of span 35M.
- Curved Span from P18B to P22B of span configuration as 1x25+3x40m
- Steel Span of 61 m has been proposed from PP9C to PP8C to avoid the piers in private property.
- Steel Span of 61 m has been proposed from PP1D to PP2D and Curved Span from PP1D to P04D of span configuration as (1x61)+1x40+1x35m

Steel plate girders shall be fabricated in a fabrication plant. The trial assembly of each girder in full length shall have to be carried out at the fabrication plant before dispatch & transported on the site. The erecting to position with a suitable launching system which shall be got approved. Widening of Deck slab in curve portion shall be done as per relevant IS/IRC codes at no cost to the employer. Contractor can opt for a better arrangement if he so desires.

PSC I Girder has been proposed at following location.


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- Curved Span from P25B to P30B of span configuration as 5x25m
- The Span configuration from PP2C to PP8C is kept as 4x25+2x22.5m to avoid the infringement with the private building boundaries.
- The Span from P01D to PP2D is of 1x15m.

1. DESIGN DATA

Main carriageway & Ramps: -

- 1) Carriageway width : As shown in drawing
- 2) Seismic effects
 - a) Seismic Zone : Zone III
 - b) Importance factor : 1.5
- 3) Design speed of vehicles : 20 to 80 kmph
- 4) Longitudinal Gradient : As shown in Tender Drawing.
- 5) Super elevation (max) : Refer Plan & Profile drawing
- 6) Exposure Condition : Very Severe
- 7) Minimum vertical clearance for traffic : 5.50 m Below soffit level on existing road level.
- 8) Live Load : As per Table 6A of IRC: 6-2017
- 9) Bearing type : POT/PTFE/Spherical
- 10) Expansion Joints : Strip seal/ Modular type
- 11) Wearing course over Deck : 81 mm(50+25+6)
- 12) Foundation Type : Suitable type of foundation shall be decided based on Geotechnical investigation.
- 13) Camber for bridge : Min. 2.5%
- 14) Steel Superstructure (Composite) : Composite Steel girders are proposed over curved spans considering feasibility & ease of launching. The span lengths mentioned are indicative.

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- a) Structural Steel : Composite Steel girder grade of steel shall be E410 (Grade A, Tensile strength 540 MPa)
Structural steel shall conform to IS: 2062 (2011) – grade – A (weld able quality) unless specified otherwise.
- Carbon steel pipes shall confirm to IS: 1161 of grade YST – 24 or higher as per requirement of structural design unless Specified otherwise.

DESIGN CRITERIA FOR STRUCTURES

1.0 GENERAL REQUIREMENTS:


In order that the tenderer's proposal qualifies for acceptance it shall generally fulfill the following requirements: -

- 1.1 It shall ensure soundness of the structure, durability and architectural beauty as a whole in harmony with the surroundings.
- 1.2 It shall ensure speedy construction and lead to appreciable economy.
- 1.3 It shall be accompanied by preliminary but fairly detailed drawings and detailed description of work and specifications of materials and items. If called upon, tenderer shall furnish any additional information necessary for appreciation and comparison with other alternative proposals received from other tenderers.
- 1.4 At the time of detailed design, normally the contractor shall not deviate from the basic scheme proposed by him for the purpose of tender.
- 1.5 The superstructure shall have minimum number of expansion joints for better riding surface The Expansion Joints shown in drawings (Vol-IV) are indicative except for Obligatory spans.

2.0 RESTRICTIONS ON TYPES OF STRUCTURES

The following types of structures /structural arrangements shall not be permitted:

- 2.1 Abutment resting on approach embankments.
- 2.2 Superstructure with hinges / half joints / articulations and gap slabs.
- 2.3 R. C. C. superstructures with spans more than 20 m c/c of piers.
- 2.4 A design in which stability of one or more spans is endangered due to failure of some other span or spans.
- 2.5 Spill through type abutment.
- 2.6 Transversely continuous wide deck resting on separate foundations.
- 2.7 Deck slab with transverse pre stressing.
- 2.8 PCC footing supporting RCC piers.

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2.9 Hollow/Cellular Piers/Foundations.

2.10 Partially pre- stressed structures. Voided slab superstructure.

2.11 Mono (Single) pile foundation System for the pier or pile bent system.

2.12 Raft Foundation with founding level 4.5 mtrs below GL & SBC less than 100 T per Sqm.

2.13 Voided Slab Superstructure

2.14 Externally pre stressed superstructure

3.0 SPECIFICATIONS FOR DESIGN AND CODES TO BE FOLLOWED

3.1 The design of all structural components shall conform to the criteria laid down in the latest edition of the codes of IRC / IS published up to one month prior to last date of receipt of tender.

3.2 For any item not covered by (a) above, MoRT&H specifications for road & bridge works (Fifth Revision) published by IRC, New Delhi in 2013 along with subsequent amendments on behalf of Govt. of India, Ministry of Surface Transport shall be used.

3.3 For items not covered by any of standards & specifications as stated above as well as sound engineering practice, provision of relevant codes of other countries shall be referred. However, in this regard, decision of the Engineer / Engineer's Representative shall be final & binding.




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Table: Design Codes for Structure

Code No.	Title
IRC:5-2015	Standard Specifications and Code of Practice for Road Bridges, Section I – General Features of Design
IRC: 6-2017	Standard Specifications and Code of Practice for Road Bridges, Section-II Loads and Stresses
IRC: 112-2020	Code of Practice for Concrete Road Bridges
IRC: 22-2008	Standard Specifications and Code of Practice for Road Bridges, Section VI – Composite Construction
IRC: 45-1972 (Reprint 1996)	Recommendations for Estimating the Resistance of Soil Below the Maximum Scour Level in the Design of Well Foundations of Bridges
IRC: 78-2014	Standard Specifications and Code of Practice for Road Bridges, Section VII- Foundations and Substructures
IRC:27-2009	Specifications for Bituminous Macadam
IRC:83-2015 (Part-I)	Standard Specifications and Code of Practice for Road Bridges Section IX Bearings, Part I: Roller & Rocker Bearings (Second Revision)
IRC:83-2015 (Part II)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings (Elastomeric Bearings), Part II (First Revision)
IRC:83-2002 (Part III)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings, Part III: POT, POT-CUM- PTFE, PIN and Metallic Guide Bearings
IRC: SP:60-2002	An Approach Document for Assessment of Remaining Life of Concrete Bridges
IRC: SP:61-2004	An Approach Document on Whole Life Costing for Bridges in India

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Code No.	Title
IRC: SP: 84 - 2014	Manual for Specifications & Standards for Four Lane of Highways Through Public Private Partnership (First Revision)
IRC SP -13	Guidelines for the design of small bridges & culverts
IRC-24-2010	Standard Specifications and Code of Practice for Road Bridges, Steel Road Bridges (Limit State Method) Third Revision)
IRC:22-2015	Standard Specifications and Code of Practice for Road Bridges, Section VI – Composite Construction (Limit States Design) (Third Revision)
	Durability Provisions for Reinforced & Pre stressed Concrete Structures” by Indian Institution of Bridge Engineers- 1994.
IS 6403	Code of practice for determination of bearing capacity of shallow foundations
IS 2911 (Part 1/Sec 2): 2010:	Design and construction of Pile Foundations - Code of practice
IS 456	Code of practice for design of Reinforced Concrete Structures
IS 800:2007	Code of practice for design of Steel Structures
IS 14268 : 1995	Uncoated stress relieved low Relaxation seven-Ply strand for pre-stressed concrete- Specification
IS 14593: 1998	Design and construction of Bored Cast-In-Situ Piles founded on Rocks– Guidelines
IS 1786 – 1985 – Third Revision	Specification for High strength deformed steel bars and wires for concrete Reinforcement.
IS 2062 – 2011	Hot rolled medium and high tensile structural steel- specifications
EN 10338 – 2009	Hot rolled and cold rolled non-coated products of multiphase steels for cold forming. Technical delivery conditions
	MORTH Specifications
IRC: 30 - 1968	Standard Letter and Numbers of Different Heights for use on Highway Signs
IRC: 35 - 2015	Code of Practice for Road Marking (with Paints)
IRC: 67 - 2012	Code of Practice for Road Signs
IRC: 79 - 1981	Recommended Practice for Road Delineators
IRC: 93 - 1985	Guidelines on Design and Installation of Road Traffic Signals
IRC:SP:31-1997	New Traffic Signs
IRC: 73 - 1980	Geometric Design Standards for Rural (Non-Urban) Highways
IRC SP: 41	Guidelines for the Design of At-Grade Intersection in Rural and Urban Areas
IS 13620 (1993) Reaffirmed 2004	Fusion Bonded Epoxy Coated Reinforcing Bars – (CED 54 :- Concrete Reinforcement)

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4.0 DESCRIPTION OF WORK AND OBLIGATORY PROVISIONS FOR PROPOSALS

- 4.0 The general arrangement of bridges shall be as indicated in the relevant tender drawings. The center line of viaduct shown on the GAD should not be changed, except under unavoidable circumstances with approval from Engineer.
- 4.1 All the structural elements shall be elegantly harmonized in respect of shapes, sizes, lines & levels.
- 4.2 Abutments shall be located approximately at the same locations as shown in the relevant tender drawing.
- 4.3 Single pier structure is mandatory except wherever otherwise shown in tender drawing.
- 4.4 Longitudinal gradients shall not be steeper than those shown in tender drawing.
- 4.5 Overall length of bridges and viaducts shall not be less than that shown in tender drawings.
- 4.6 Horizontal & Vertical clearance at obligatory locations shall be as per tender drawings.
- 4.7 The radius of curves as indicated in the design criteria / indicative drawings shall not be less than that indicated for all viaduct structures.
- 4.8 Discontinuous kerbs shall be taken at least 15.0m beyond the center of valley curve at both ends.
- 4.9 Supplementary data for design shall be as per design data.
- 4.10 Roadway particulars & carriageway widths shall be as per documents / tender drawings.
- 4.11 The Vertical geometry of the finished surface of roads shall be in the form of a smooth curve where change in gradient occurs. The design of curves shall be got approved from the Engineer. The design of curves shall comply relevant IRC codes/ guidelines. The design speed on curves shall be as stipulated in design data.


5.0 DESIGN LOADS

Dead Loads

The unit weights of the construction materials shall be as defined in IRC: 6-2017, unless otherwise confirmed using weights of representative samples.

Table -1: Density of Materials

Material	Density
Plain Cement Concrete	25 kN/cu.m
Reinforced Cement Concrete (RCC)	25 kN/cu.m
Pre-stressed concrete	25 kN/cu.m
Structural steel	78.5 kN/cu.m
Earth compacted	20 kN/cu.m
Mastic in wearing coat	22 kN/cu.m

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Super Imposed Dead Load

Wearing course shall consist of DBM, Mastic & over water proofing membrane. Superimposed Dead Load (SIDL) due to Crash barrier, kerbs; services etc. shall be taken based upon density of materials and cross sections as specified in IRC codes.

Adequacy of all SIDL's shall be re-confirmed in the detailed design against actual loads involved in the Works.

All structure shall be checked for additional relaying of wearing coat weight of 200 kg/sqm for the purpose of design.

Live Loads

The live load shall be as per IRC: 6-2017 including Special Purpose Vehicle (SPV). In additional combination of IRC loading along with congestion factor shall be considered. The congestion factor over design axle load shall be taken as per Table – 3 of IRC 6-2017.

Centrifugal Forces

Effect of Centrifugal Forces on structures shall be considered as per relevant Clause of IRC 112-2020 provisions.

Seismic Force


The seismic force on structure shall be calculated as per Cl. No 219 of IRC 6 - 2017. This project is located in zone III. Thus, zone factor (z) to be considered is 0.16. The importance factor shall be 1.5 as per Table 8 of IRC: 6-2017. Appropriate Response reduction factors for various elements of bridge structure shall be taken as per Table 9 of IRC 6-2017. Soil structure interaction shall be considered wherever applicable. The seismic forces calculated in longitudinal and transverse direction will be combined as per Cl. No 219.4 of IRC 6-2017.

Wind Loads

Wind forces are to be considered as per as per Cl. No 209 of IRC 6-2017. Basic wind speed that will be considered in the design is 44 m/sec. The intensity of wind force shall be based upon hourly mean wind speed and pressures. The hourly mean wind speed and pressure values given in Table 5 of IRC 6–2017 correspond to basic wind speed of 33 m/sec. These will be calculated for the basic wind speed of 44 m/sec and other terrain conditions

Temperature Loads

The temperature loads shall be considered as per Cl. 215 of IRC 6-2017. Critical temperature and differential temperature effects shall be determined and applied. For the purpose of calculating temperature effects, the coefficient of thermal expansion for RCC, PSC and steel structures may

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be taken as $12.0 \times 10^{-6} / ^\circ\text{C}$. A temperature variation of $+5^\circ\text{C}$ to $+42.5^\circ\text{C}$ will be considered for all structures. The Superstructure shall also be designed for effects of distribution of temperature across the deck depth as given in Fig. 10 of IRC- 2017, suitably modified for the surfacing thickness.

Temperature effects shall be considered as follows:

1. Effects of non-linear profile of temperature shall be combined with 50% live load and full value of 'E' shall be considered.
2. Effects of global fall and rise of temperature shall be combined with 100% live load and full value of 'E' shall be considered

Longitudinal Forces due to Live Load

Following effects shall be considered in the design.

1. Braking forces as per the provision of IRC: 6-2017.
2. Distribution of longitudinal forces due to horizontal deformation of bearings/frictional resistance offered to the movement of free bearings as per IRC: 6-2017.

Construction Loads

Construction loads shall be considered according to the method to be used for construction/erection.


In addition, for deck structures subject to mobile construction plant and/or equipment essential for the assumed method of construction, the structures shall also be designed for the assumed temporary loads of the construction plant and/or equipment at each construction stage. However, a uniformly distributed load of 3.6 kN/m^2 of the form area shall be considered to account for construction stage loadings in the design of superstructure elements, wherever applicable, as per IRC: 87-2011.

A minimum dynamic amplification of 50% of the loads during normal lifting operations shall be assumed, unless a lower factor can be justified to the approval of the Engineer considering the specific construction method and the actual construction plant and/or equipment which will be used.

Where precast or pre-fabricated segments are installed, the consequences to the stability of the structure due to sudden loss of a segment (failure of the lifting equipment) shall be determined. The consequences shall not be disproportionate to the event. A minimum dynamic amplification of 100% of the loads due to the sudden loss of a deck segment (as a construction condition) shall be assumed.

Buoyancy

100% buoyancy shall be considered while checking stability of foundation irrespective of

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their resting on soil/weathered rock/or hard rock. However, the maximum base pressures shall also be checked under an additional condition with 50% buoyancy in cases where foundations are embedded into hard rock. Pore pressure uplift limited to 15% shall be considered while checking stresses of the substructure elements.

Creek & Shrinkage Effects

Effect of creep and shrinkage on structures shall be considered as per IRC 112-2020 provisions.

6.0 LOAD COMBINATION


All members shall be designed to sustain safely the most critical combinations of various loads and forces that can coexist. Various load combinations as relevant with increase in permissible stresses considered in the design shall be as per IRC: 6-2017 and IRC: 78. In addition, the stability of bridge supporting two superstructures (with an expansion joint) shall be checked under one span dislodged condition also.

Load combinations as per Annex B, IRC 6-2017 shall be considered.

7.0 FOUNDATIONS

The following requirements shall apply to the design and construction of the foundations:

- 7.0** Tender drawings/GAD are tentative & for guidelines of contractor. The contractor shall ensure the strata by taking bores at each foundation location. Cost variation (Extra / Rebate) regarding change in foundation depth will be paid to the contractor as per range of respective lengths/ depths mentioned in Cost variation schedule.
- 7.1** The contractor shall have to take bores by double tube boring machine at the final location of each pier and abutment prior to the commencement of the work to ascertain the rock levels and quality at the location of the foundations and this shall form part of the contract. The cost of these test and interpretation of the results shall be included in the tendered amount. No payment will be made separately for boring and testing of soil or rock.
- 7.2** Foundation types shall be decided based on Geotechnical Investigation.
- 7.3** Soil Properties
In absence of actual field data, the properties of back fill shall be considered for design purpose as below.
 - i) Dry Density of Soil – 1.80 T/Cum
 - ii) Saturated Density of Soil – 2.00 T/cum
 - iii) $\Phi = 30^\circ$, $\delta = 20^\circ$
 - iv) $C = 0$
- 7.4** Rock/soil anchors of pre stressed or non-pre stressed type should not be applied for

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resisting tension and/or anchoring foundation to rock/ soil for piers and abutments.

7.5 In case of pile foundation:

- The pile capacity shall be confirmed by pile load tests as per latest version of IS-2911(Part IV). The vertical capacity of the pile shall be verified by carrying out initial load testing on Test Piles in non-working areas, in the vicinity of the bridge site. These piles shall be tested for 2.5 times the design load. These tests and the routine tests shall be as per the latest version of I.R.C. 78. The dynamic load test and the pile integrity test may be permitted subject to verification of the results with static load test performed on the same pile.
- Side friction (Skin Friction) from G.L. up to embedment level shall not be considered during design.
- The piles shall be designed as end bearing as well as friction in socketing length considering fixity as mentioned.
- There shall be no tension at the base of the pile under any load combination.


The cost of all pile load tests shall be borne by the Contractor and the tendered amount shall be deemed to include all these and such costs.

SUBSTRUCTURES

Due importance shall be given to aesthetics of piers and superstructure, the shape of structure should give pleasing appearance and architectural beauty as a whole in harmony with the surroundings. The structure shall be generally symmetrical; the viaduct shall have uniform aesthetical appearance to enhance the overall look and thereby the vicinity. Aesthetic finishes like grooves, embossed or surface textures to be provided for substructure and superstructure as per the detailed drawing approved by the Engineer.

The following requirements shall apply to the design and construction of the piers:

- 7.6** RCC solid piers which are aesthetically treated shall be accepted.
- 7.7** Scope for accessibility for inspection of bearings and arrangement for lifting of the superstructure for future replacement of bearings shall be provided for in the design of substructure and superstructure. The positions of flat jacks shall be distinctly marked on the drawing.
- 7.8** Details of shape, finish, color consistent for bridges shall be submitted by the contractor in three different alternatives for approval of employer. Employer will select one of them, with or without modifications which will be binding to the contractor without any additional financial implications.
- 7.9** The height of pedestal shall not be less than 150mm & not more than 500mm including thickness of bearings.
- 7.10** Groove design shape of single piers shall be rectangular with round edges. Piers shall keep uniformity in shape throughout the Project, except for unavoidable cases

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such as changes to the width of road or pier interval for reasons of reducing the adverse effect on landscape or aesthetics.

SUPERSTRUCTURES

Superstructure for the pre-stressed concrete (PSC) bridges for the project is proposed to be of precast PSC-Spine Wing Segmental Box Girder, Precast PSC-Segmental Box Girder, Precast PSC I-girder & Steel Composite Plate Girder type.

7.11 Deck slab thickness shall not be less than 250mm at the tip of cantilever, irrespective of the provisions elsewhere. The cantilever projection of slab in transverse direction shall be as per relevant IRC code, Continuity in Deck slab is allowed, stage construction of deck slab is not allowed.

7.12 RCC Slab / Girder


- i. The cross diaphragms shall be a minimum of one number at each support and at ends of longitudinal cantilever if any.
- ii. Finite element method of analysis shall be adopted for arriving at the design forces in curved superstructure only.
- iii. Reinforced concrete superstructures spanning in the direction of main span of viaducts and bridges should not be adopted, except at locations where the viaduct span is 15.0m or less.

7.13 Precast PSC Girder & Composite RCC Slab

- i. PSC Girder may be precast or cast-in-situ as mentioned on the drawing or as directed by the Engineer.
- ii. Girders may be post-tensioned or pre-tensioned. Where precast construction is required to be adopted, selection of casting yard and details of methodology and of equipment for shifting and launching of girders shall be included in the method statement.
- iii. In case of cast-in-situ construction, the sequence of construction including side shifting of girders, if applicable, and placing on bearings shall be in accordance with the drawings.
- iv. The PSC girder constituting the top flange, web and the bottom flange shall be concreted in a single operation without any construction joint.
- v. The portions of deck slab near expansion joints shall be cast along with reinforcements and embedment for expansion joints. For this purpose, the portion of deck slab near expansion joints may be cast in a subsequent stage, if permitted by the Engineer.
- vi. The surface finish of the deck slab shall be finished rough but true to lines and levels as shown on the drawings before the concrete has hardened. Care shall be taken for setting of bearings as indicated on the drawings.

7.14 Precast PSC Concrete Box girder & Slab.

- i. In the absence of rigorous analysis for torsional and distortional moments and forces due to warping torsion at ends, the design live load moments and shear force in the longitudinal direction shall be increased by 20% and transverse

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reinforcement by 5% in case of Box type of Superstructure.

- ii. All pre stressed concrete members shall have spare cables laid to the profiles as per approved drawing. The number of spare strands shall be at least 5% of the strands required as per design, subject to a minimum of one cable per girder/web. These cables shall be permitted to be removed fully or partly after the final stage of pre stressing, if they are not required and holes grouted.
- iii. Specific provision shall be made to permit future addition of un-bonded external tendons (PSC Blisters inside the box section etc.) symmetrically about the bridge centerline for post tensioning force of not less than 20% of the positive and negative moment primary post tensioning forces. Detailed arrangements for external pre stressing and design calculations shall be given & got approved from the Engineer. An onsite demonstration of the same shall be arranged by the contractor at casting yard level.
- iv. The maximum permissible jacking force shall not exceed 76.5 percent of the theoretical ultimate tensile strength of HTS.


7.15 Precast PSC Segmental girder.

Segmental Construction

The work specified in this Section shall consist of the manufacture of structural precast concrete segments and the storage, transport and the erection of these segments into the completed structure. The final structure shall conform to the lines and grades and the design dimensions shown on the plans and with the provisions of these Specifications. This work also includes reinforcing steel embedded in the segments and the casting of the closure joints.

Definitions

1. Segment refers to a modular section of the superstructure. The cross-section, length, and details of the segments are as shown in the Design Drawings.
2. Match Cast refers to a precast concrete fabrication procedure whereby a segment is cast against the preceding segment thereby producing a matching interface that will permit reestablishment of the cast geometry at the time of erection. Match casting may be accomplished by either the short-line casting method or the long-line casting method.
3. Short-line Casting is the method of casting segments one at a time on a casting bed utilizing a fixed or movable bulkhead. The first segment is cast between bulkheads, and successive segments are cast, one at a time, against the bulkhead on one end and the repositioned, previously cast segment on the other end.
4. Balanced Cantilever Erection is a method by which the segments are sequentially placed, in cantilever, alternately on either side of the pier to a point where a closure joint is cast in place.
5. Camber is the amount by which the concrete profile at the time of casting must

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differ from the theoretical geometric profile grade in order to compensate for all structural dead-load, posttensioning, long-term and time-dependent deformations (creep and shrinkage), including the intermediate erection stages and effects.


6. Casting Curve: is the curve of casting geometry that is followed at the casting bed to achieve the theoretical profile after final deformations have taken place. The casting curve is developed by integrating theoretical profile and camber.
7. Erection Elevations are the elevations to which segment joints should be located at each stage of erection in order for the bridge deck to match the theoretical roadway profile after construction and after all long-term dead load deflections have occurred.
8. Shop Drawings are documents prepared from the information shown on the Design Drawings which provide details necessary for the construction of the work. "Shop Drawings" is a general term that includes drawings, diagrams, illustrations, samples, schedules, calculations, and other data. The precast segments shop drawings are drawings that are clearly detailed to show the relationship between reinforcing bars, post-tensioning hardware, and all other embedded items in an attempt to avoid interferences between these elements.
9. Casting Manual: is a manual for the casting and the geometry control of the precast segments prepared by the Contractor and/or the Construction Engineer in accordance with the information provided in the Design Drawings, the Shop Drawings and these Special Provisions.
10. Erection Manual: is a manual for the detailed step-by-step erection of the precast segments including all intermediate procedures relating to any erection equipment, falsework, counterweights, post-tensioning, placement or removal of temporary supports, closure operations. The manual also includes theoretical erection elevations at each stage of erection, and survey monitoring procedures.
11. Standard Specifications: Standard material specifications conforming to MoRTH specifications or equivalent Indian Standards, British Standards, AASHTO, ASTM as applicable.

Contractor Proposed Options

The contractor may propose, for consideration by the Engineer, certain variations from the construction and erection schemes shown in the contract documents.

Options for construction details covered by this section are limited to the following

- a) Segment lengths may be reduced or increased for those detailed.
- b) Optional post-tensioning systems or layouts provided that optional systems meet the requirements specified hereinafter and the requirements set out in Section 2.10

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Restrictions to Contractor Proposed Options

Any redesign or modification with regard to method of superstructure construction or pre stressing differing in any respect from the structure as designed and detailed on the plans shall comply with the following:


1. The Contractor demonstrates that any proposed option or modification meets the design criteria noted on the plans and in the Specifications.
2. Stressing blocks for any optional or modified permanent pre stressing system's anchorages shall only be located within the slab, within the webs of box girders, within reinforced stressing blocks or within partial depth diaphragms of the box girder. Stressing blocks for any temporary pre stressing system anchorages may be located within the slabs, in partial depth diaphragms within the box girder, in external systems temporarily anchored to the girders and removed after use or a combination of any of the above methods. All construction added outside the box girder for temporary pre stressing shall be subsequently removed to restore the girder to the designed cross section shown on the plans or as approved by the Engineer.
3. Any precast, match-cast proposal shall utilize the multiple shear key concept; single shear keys will not be permitted.

Shop Drawing Requirements

The contractor shall submit detailing drawings on the following items:


Fully and accurately dimensioned views showing the geometry of each segment including projections, recesses, notches, openings and blackouts.

1. Complete details of the fabrication system to be used including the forms, foundation and geometry control.
2. Complete geometric layouts for each post-tensioning tendon. Tendon layout shall be accomplished so as to cause no curvature within the longitudinal limits of the trumpet component of a tendon anchorage device. Integrated shop drawings shall not be submitted until these tendon layouts have been noticed by the Engineer.
3. Fully integrated drawings showing reinforcing steel, pre tensioning strands, post-tensioning duct, post-tensioning hardware, inserts, lifting devices and any other items to be embedded in a segment. Details of mild steel reinforcing shall be clearly shown as to size, spacing and location including any anchorage reinforcing not shown in the plans, which may be required by the posttensioning anchorage system selected by the contractor. Details of post-tensioning ducts shall clearly indicate the size, type, horizontal and vertical profiles, duct support, grout pipes and concrete covers. Any drawing not showing all items to be embedded in the segment concrete will be returned to the contractor for resubmittal as a part of an integrated drawing. Prior to submittal, the contractor shall review these drawing to determine the absence of reinforcement and tendon or embedment conflicts. Any unresolved conflicts shall be assigned a creation

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mark indicating its location and order in the creation sequence. The Contractor shall be solely responsible for any and all effects of conflicts found during fabrication.

4. Casting curves shall be prepared in accordance with the casting and erection methods, schedule, loads, and material properties proposed by the Contractor. The casting curves shall be of sufficient accuracy to allow the determination of control point settings for accurately casting the segments. The preparation of the casting curve shall recognize all deviation from straight line and deformation due to the final requirement and due to dead load, and future superimposed dead loads, erection loads, post – tensioning stresses including secondary movements, creep and shrinkage. Each casting curve submittal shall be accompanied by all information (loads, casting and erection schedules, material properties, etc.) considered in its development. In developing casting curves, deformations due to creep and shrinkage and the concrete modulus of elasticity shall be computed using the latest recommendations of CEB-FIP Model Code for Concrete structures. CEB-FIB stands for Comité Euro-International De Béton –Federation International De La Précontrainte. The preparation of casting curves is dependent upon the erection procedure, which has been previously approved, he shall develop a new curve in the same manner as required for the original casting curve. The Engineer may waive submittal of a revised casting curve if he considers the change to erection procedures to be insignificant. The Contractor shall include with submittal of a revised casting curve his proposed method (s) and location (s) for transitioning between the current curve(s) in use and the submitted curve(s). The preparation of casting curves shall be done at no additional cost and shall be considered incidental to the contract.
5. The Contractor shall similarly adjust initial bearing elevations and structure geometry for time dependent displacements.
6. Complete details of handling, storing and transporting segments. These details shall include for each type of segment, the method of lifting (location of any inserts, configuration of lifting devices, etc.) and the method of supporting segments during storage and transportation, the planned route for transporting the segments and the axle loads for the segment hauler. The details shall be accompanied by calculations indicating that the forces imposed on a segment during lifting, storage and transportation will not adversely affect the structural adequacy of the segment.
7. If the segments are to be stacked, calculations showing the stresses induced by stacking shall be prepared and submitted for approval.
8. A detailed step-by-step procedure for erection of segments, post-tensioning, etc., including the sequence in which these items are to be erected and a table of theoretical elevations and alignment of the geometry control points established during casting of each segment computed at each stage of erection. Stages for which theoretical positions of control points are to be computed shall include the segment in place prior to applying post-tensioning and the segment with post-tensioning applied.

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The theoretical position shall be computed taking into consideration:

1. The effect of as-cast geometry established from surveys during casting of segments.
2. Effects of construction dead and live load.
3. Effects of post-tensioning.
4. Effects of creep and shrinkage. Deformation due to creep and shrinkage and the concrete modulus of elasticity shall be computed using the latest recommendations of CEB-FIB
5. Model Code for Concrete Structures.
6. Effect of the final profile of the roadway as shown in the plans.

The procedure shall also include a method for measuring and recording the elevations and alignment of all control points at each stage of erection.


The Contractor shall submit a new erection procedure at any time that he proposes to deviate from the sequence of schedule of erection contained in an approved erection procedure under which he is operating.

7. Complete details covering equipment to be used to handle segments and incorporate them into the structure, erection methods to be used, the sequence of erection, all loads to be imposed on any portion of the permanent structure by the erection equipment and details covering the procedure for load testing of erection equipment.
8. Calculations prepared which show that the loads imposed on the permanent structure by the erection equipment will not adversely affect the structural adequacy of the permanent structure, nor exceed allowed stresses during the construction process.
9. Complete details including dimensions and showing reinforcing steel, post-tensioning ducts and hardware and other embedded items for all cast –in- place concrete which includes reinforcement or prestressing tendons which extend or pass into precast concrete units.
10. A manual for the casting and geometry control of the segments prepared by the contractor or his Engineer in accordance with the information provided in the Contract Plans and Documents or as required by this specification.
11. A manual for the detailed step by step erection of the segments including all intermediate procedures relating to any erection equipment, falsework, movement of equipment, support jacking, stressing of temporary post-tensioning bars, closure operations including any partial stressing across the closure during concrete curing, location and size of shim blocks, main field survey and alignment control methods to be employed for setting the initial and subsequent segments and any other relevant operations.

Material

(1) Concrete

All concrete shall be Grade M60 conform to Section 2.7 except as specifically modified herein. Gradation for coarse aggregate utilized in the concrete for segments shall be such that 100

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percent passed a 25 mm sieve.

(2) Sheathing for Post-Tensioning Tendons

Equipment

1. General

Design calculation prepared shall be submitted for any erection equipment, falsework, and other temporary construction, which may be required to accomplish the work. In addition, calculations pertaining to the permanent structure showing acceptable stress level and acceptable factor of safety against failure must be submitted when portions or whole of the permanent structure is loaded during construction.

Prior to use of any equipment that is fabricated for the specific purpose of erection any portion of the work included in this construct, the Contractor shall demonstrate by a full-scale load test that this equipment is adequate for its intended use on this project.

Observation of load testing of erection trusses, or erection equipment, or review of design drawing and calculations covering erection trusses, or erection equipment by the Engineer shall not be construed as any assumption by the Engineer of responsibility for means, methods, techniques, sequences or procedures of construction, nor on safety precautions or to a safety program thereto.

2. Brackets Supporting Truss for Span-by-Span Erection.

If an erection truss is to be supported by any part of a pier, in designing support brackets, a lateral force equal to not less than ten percent of the weight of the truss plus the weight of segments to be placed on the truss shall be applied longitudinally. Also, these brackets must have a secondary means of vertical support, which does not rely on friction between the support and the pier.


If an erection truss is to be supported by any part of a pier via support brackets, the design of the brackets shall conform to the following minimum:

- A lateral force equal to not less than ten percent of the weight of the truss plus the weight of segments to be placed on the truss shall be applied longitudinally.
- Brackets must have vertical support that does not rely on friction between the support and the pier.

3. Load Testing Truss for Span-by-Span Erection

Prior to using an erection truss on the project, the Contractor shall demonstrate the capability of the truss to perform as intended by a full-scale load test. The load test procedure shall include:

- a) Constructing two temporary piers approximately the size and shape of the upper portion of the pier, duplicating the relevant portion of the permanent piers, which are to be constructed on the project. The elevation of these temporary piers shall be such that when the erection truss is assembled on them it will be a sufficient distance above the ground to allow any necessary working space beneath it. The temporary piers may be constructed on foundations for the permanent structure. Alternately, the contractor may use the completed

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sub structure for the first span to be erected to support the truss during the load test.

b). Assembling the truss supported on the piers in the same manner and using the same supporting devices (beams, brackets, etc.) as will be used on the project.

c) Test loadings the truss with the heaviest segment it will support during erection of the bridge plus an additional load equal to the 25 percent of the weight of the segment.

d) Measurement of vertical displacement at mid span and horizontal movement at support points.

e) The Contractor shall give written notice to the Engineer at least 72 hours in advance of the time at which loading of the truss is to be accomplished.

4. Load Testing Special Equipment for Cantilever Erection.

Prior to using a launching gantry, a beam and winch or any other equipment specifically fabricated for the purpose of lifting precast segments must be load tested. The contractor shall demonstrate by a full scale load test that the equipment is capable of supporting a load equal to 125 percent of the weight of the heaviest segments to be lifted. The full scale load test shall be conducted with the equipment supported in the most extreme loading condition to be encountered during its use on the project.

The Contractor shall give written notice to the Engineer at Least 72 hours in advance of the time at which the test load is to be supplied.

Construction Requirements

(1) Casting Concrete

a) General

All material, details, and procedures shall be as specified herein or noted on the plans. Casting of segments shall not begin until review of the shop drawings, required computations, the posttensioning system and a concrete mix design, including a hot weather mix design, has been completed and approved by the Engineer. The segments shall be match-cast.

b) Design and Maintenance of Forms


The design, engineering, and construction of the forms and falsework shall be the responsibility of the Contractor. Forms shall be inspected and approved by the Engineer prior to authorizing casting operations. Forms which are worn, damaged or otherwise unacceptable to the Engineer shall be repaired to the Engineer's satisfaction before the casting of any segment will be authorized. Any segment cast in forms unacceptable to the Engineer is subject to rejection.

Forms which will not produce segments complying with the specified casting tolerance shall not be used until corrections are made. Segments with unacceptable will be rejected.

Forms show damages due to improper maintenance or handling, shall be discarded or repaired.

All repaired forms shall be re-approved by the Engineer to authorizing casting operations.

Forms shall be mortar tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incidental to the concrete operation, including vibration. Forms

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shall be capable of casting the segments as shown in the plans.

All exposed surface of each element of the structure shall be formed with material, which will produce a similar surface texture, color and appearance for all concrete surfaces. The form surfaces of casting machines for superstructure shall be made of steel. The metal used for forms shall be of such thickness that the forms will remain true to shape. All bolt and rivet heads shall be countersunk. Clamps, pins or other connecting devices shall be designed to hold the forms rigidly together and to allow form removal without injury to the concrete.

The inside surfaces of forms shall be cleaned of all dirt, mortar and foreign material. Forms shall be properly coated with form oil prior to each use. The form oil be a commercial quality form oil or other equivalent coating which will permit the ready release of the forms and will not discolor the concrete. Form oil shall be applied such that none is deposited on the reinforcement in the forms where sections of forms are to be joined, a maximum offset of 2 mm for flat surfaces and 4 mm for corners and bends will be permitted.

The Contractor accurately survey forms on a periodic basis for the purpose of monitoring settlements and distortion in shape. If any settlements or distortions are of sufficient magnitude to interfere with achieving the required segment tolerances, casting with these forms shall be discontinued until the problem is corrected.


c) Preparation of Casting

Care shall be exercised in setting up forms for casting segments. All materials to be encased within the concrete of the segment shall be properly positioned and supported. Provisions for all projections, recesses, notches, openings, block-outs and the like shall be made in accordance with the approved shop drawings. Extreme care shall be taken in positioning the match-cast segment in relation to the segment to be poured. The match-cast segment shall not be twisted.

The abutting surface of the bulkhead segment shall be covered with a thin film of a bond breaker consisting of flax soap and talc, or other material approved by the Engineer. The soap and talc mixture will be approximately five parts flax soap to one part talc. The mixture may be varied based on job experience and results. The acceptability of a material other than soap and talc shall be determined by demonstration on a large specimen, which has a facial area of at least 0.4 square meters, prior to its use in casting of the segments.

d) Geometry Control

General: Before commencing the casting operation, the Contractor shall submit to the Engineer, for approval, his proposed method of geometry controls for both the casting and erection operation. This submittal shall be in the form of a "Casting Manual" and shall include, but not be limited to, the following information: a detailed narrative of the geometry control theory, a detailed narrative of the step-by-step geometry control procedure, detailed calculation forms, and a set of sample calculations. This submittal shall include all measuring equipment, procedures, the locations of the control points to be established on each segment and the qualifications of personnel who will carry out geometry control. The casting manual shall cover all geometry control operations necessary for casting and shall be in agreement

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with the Contractor's chosen methods of casting and erection, including erection survey, elevation and alignment control.

Casting shall not commence without the Engineer's approval of the geometry control method. Instruments used in the casting yard for horizontal geometry control shall be mounted on a permanent platform independent of any other structure. Instruments used in the casting yard for vertical geometry control of super-structure segments shall be mounted on a sturdy tripod set on top of the segments being surveyed. Provisions shall be made to protect instruments from construction activities and to minimize the effects to wind and temperature variations on the accuracy of readings.

A minimum of two permanent horizontal control points shall be established on line with the instrument mounting point. Permanent bench marks shall be established at locations where they will not be disturbed by construction activities. The horizontal control points and benchmarks shall be located so as to be continuously visible from the instrument's location. Prior to beginning casting operations using the short cell method, horizontal and elevation control points shall be established on the fixed bulkhead. The alignment, elevations, and shape of the fixed bulkhead shall be checked by the readings on these control points each time the geometry of adjoining segments is checked. Immediately after casting of a segment is completed, the length of the segment along the line of each web shall be measured and recorded and references for horizontal and vertical control shall be established as follows:


- i. Horizontal Control- A wire stirrup on the horizontal control line at both ends of the segment. A line not more than 0.5 millimetres in width shall be scribed in a permanent manner into each stirrup. Wire stirrups shall be stainless steel.
- ii. Vertical Control- A flat head bolt, with a pin hole in the head, approximately flush with the surface of the concrete over each web at both ends of the segment. Bolts shall be stainless steel.

After a segment is cast, and before bond breaking, the positions of the two adjoining segments shall be checked from established control points. If the positions are not as required, corrections to the geometry shall be made in the next segment cast utilizing the established control points.

Special Requirements for Short Cell Casting of Structures with Complex Geometry Control

The following additional requirements shall apply to geometry control for short cell casting of segment, for bridges with horizontal curvature and varying super-elevation, and for bridges, which are to be erected using the cantilever method.

- i. The instrument used to measure elevations shall be precision levels equipped with parallel plate micrometres capable of obtaining first order control and one piece Invar with centring point bases.
- ii. The instruments used to make horizontal measurements shall be one- second theodolites.
- iii. A micrometre on either the theodolite or the foresight target shall be used for

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horizontal measurement reading on segment control points.

- iv. Personnel who directly supervise layout and geometry control measurements shall have a minimum of four years' experience as a party chief.
- v. The position of two adjacent segments shall be independently determined by the Contractor and the Engineer. Horizontal readings shall be taken with the theodolite in both direct and inverted mode. Casting shall not begin until these surveys agree within the following tolerance.

Elevation: 0.5 mm on any control point.

Horizontal: 0.5 mm and 2 seconds of arc on any control point.


e) Embedded Items

Reinforcing steel shall be fabricated and placed in accordance with the plans and as required herein. No reinforcing steel be cut or removed to permit proper alignment of tendon ducts or other embedded items. Any bar that cannot be fabricated to clear a post-tensioning tendon shall be replaced by additional bars with adequate lap lengths using a method approved by the Engineer. In the plane of the steel parallel to the nearest surface of concrete bars shall not vary from plan placement by more than 10mm, or 1/12 of the spacing between bars, whichever is less. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than 12 mm.

The top and bottom clear cover of reinforcing steel shall be within 5mm of the clear cover limits dimensioned on the plans. The end and edge clear cover of the reinforcing steel shall be within 25 mm of the clear cover limits dimensioned on the plans.

Embedded ducts for tendons shall be positioned accurately (within 5mm) in respect to their vertical, linear and transverse position within each segment. Positive methods shall be utilized to assure that ducts will not be displaced during casting. Ducts which act to change the alignment of tendons shall be marked so that proper positioning is assured prior to casting and can be positioned after casting. The Contractor shall indicate on the shop drawings his method of marking and positioning. The Contractor shall submit to the Engineer, for approval, the method he proposes to use to align ducts passing from cast-in-place concrete into precast units.

Methods and spacing of supports for ducts shall be shown on the shop drawings. After installation in the forms, the end of the ducts shall at all times be sealed to prevent entry of water and debris. Following each pour of concrete, the Contractor will be required to demonstrate that all empty ducts are free of water and are unobstructed and undamaged. Immediately prior to installation of the pre stressing steel, the contractor shall again demonstrate, to the satisfaction of the Engineer, that all ducts are unobstructed and that they are free of water and debris. Lifting devices incorporated in superstructure segments shall be adequate to distribute the handling and erection stresses so as not to damage the segment. The anchoring devices for transverse top slab post-tensioning shall be recessed so that the ends of the pre stressing steel and all parts of anchoring devices will be at least 50 mm inside the end surface of the segment. Following post-tensioning, the recesses shall be filled in

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accordance with the details noted on the plans.

Transverse post-tensioning anchors shall be placed into the form before the concrete is cast.

Temporary block-out for anchors shall not be allowed.

(2) Placing Concrete

Placing concrete shall meet the requirements of hereinafter and Section 2.8. Concrete shall not be deposited into forms until the entire set up of the forms, reinforcement, ducts, and anchorage has been thoroughly inspected and checked. The placing of concrete shall not be permitted until the Engineer is satisfied that the rate of producing and placing concrete will be sufficient to complete the proposed pour and finishing operations within the scheduled task, that experienced concrete finishers are available where required for finish work and all necessary finishing tools and equipment are on hand at the site of work and are in satisfactory condition for use. During conveying, placement, and initial set, the concrete shall be protected against undue drying or rise in temperature and inclement weather. The placing of concrete shall also not be permitted until the Engineer is satisfied that adequate measures, and protection, are available to prevent weather damage during conveying and placement.

Special care shall be taken to plan the sequence of placing concrete so as to assure that voids do not occur within the concrete in areas where air is likely to be entrapped within the forms or in areas where flow of the plastic concrete is constrained by embedded items.

Concrete shall be placed in horizontal layers not more than 450 mm thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding layer has taken initial set. Each layer shall be so consolidated as to avoid the formation of a construction joint with a preceding layer, which has not taken initial set. Bridge deck concrete on super elevation and / or grade that exceeds 0.02 m per m, shall be placed from the low point upward.


Immediately after the work of placing concrete is halted, all accumulations of mortar splashed upon the remaining exposed reinforcement and surfaces of forms shall be removed before the concrete takes its initial set. Care shall be taken when cleaning reinforcing steel to prevent damage to or breakage of the concrete-steel bond.

Placing equipment shall be of a size and design that will permit the placing of concrete within the time limits set in Section 2.8. Placing equipment shall be cleaned as necessary at the end of each operation or work day and, just prior to reuse, shall again be checked and cleaned of hardened concrete and foreign materials.

Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature.

An approved device shall be used at the discharge end of a belt conveyor to prevent aggregate segregation. Mortar shall not be allowed to adhere to the return length of the belt. Concrete shall be discharged into a hopper or through a baffle.

No construction joints will be permitted within a segment except as detailed on the plans.

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(3) Tolerances

The following tolerances shall apply to the fabrication of precast segments:

Width of Web ± 3 mm

Depth of Bottom Slab ± 3 mm

Depth of Top Slab ± 3 mm

Overall Depth of Segment ± 5 mm

Overall Width of Segment ± 5 mm

Length of Segment ± 5 mm

Diaphragm Dimensions ± 10 mm

Ends (deviation from a ± 5 mm per 5 m not to exceed 10 mm plane per 5 m width of depth)

Flat Surface (deviation ± 1 mm per 0.5 m not to exceed a total of 5mm from a plane at any location)

Dimensions from segment to segment shall be adjusted so as to compensate for any deviations within a single segment so that the overall dimensions of the completed structure will conform to the dimensions shown on the plans.

(4) Vibration

All concrete shall be consolidated by means of approved vibrators together with any other equipment necessary to perform the work as specified. Internal vibrators shall have a minimum frequency of 8,000 vibrations per minute and sufficient amplitude to consolidate the concrete effectively. At least two standby vibrators in working condition shall be provided for emergency use in case of malfunction. The use of external vibrators for consolidating concrete will be permitted and may be required when the concrete is inaccessible for adequate consolidation.

When external vibration is used, the forms shall be constructed sufficiently rigid to resist displacement or damage. Vibrating of concrete shall be done with care and in such a manner as to avoid displacement of reinforcing, ducts, and other embedded items.

(5) Removal of Forms


Weight supporting forms shall remain in-place until the concrete has reached the characteristics compressive strength specified for form removal. For precast segments, constructed as shown in the plans without design modifications, this strength shall be at least 24 [Corr 3*] MPa unless otherwise designated in the plans.

Care shall be exercised in removing the forms to prevent spalling and chipping of the concrete. Prior to moving a segment from its as-cast position, erection marks identifying its location in the structure and order in the erection sequence shall be affixed to the inside of the segment.

(6) Test Samples

Additional test samples and testing for compressive strength on each precast segment and field closure joint shall be made by the Contractor to control the construction activities and to ensure adequate strength of these components at various stages of their manufacture and assembly.

The Contractor shall make test cubes from concrete representative of that used to cast the

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structural component, in accordance with the applicable portion Section 1700, cured in the same manner as the structural components to ensure adequate compressive strength has been achieved in accordance with the plan requirements for the following conditions.


1. Prior to form release and / or moving the components to storage.
2. Prior to post-tensioning transverse tendons if the component is less than 28 days old.
3. Prior to placing a component into position in the structure and / or stressing of post-tensioning tendons if the component is less than 28 days old.

The test specimens for precast segments shall be stored in or on the segment, in a condition representative of the curing conditions that the segment is exposed to. The specimen shall be tested just prior to form removal. The Contractor shall provide sufficient specimens to allow for additional tests, as required.

(7) Curing Concrete

Curing shall be accomplished by the use of steam curing, such curing shall conform to Section 2.6 as modified by the following:

- 1) After placement of the concrete, members shall be held for a minimum four hour pre steaming period. If the ambient air temperature is below 100 C, steam shall be applied during the pre-steaming period to hold the air surrounding the member at a temperature between 100 C and 300 C. When the ambient air temperature is above 100 C, the member shall remain undisturbed in the ambient air for a four-hour pre steaming period.
- 2) To prevent moisture loss on exposed surfaces during the presteaming period, members shall be covered as soon as finishing is complete or the exposed surfaces shall be kept wet by fog spray or wet blankets.
- 3) Enclosures for steam curing shall allow free circulation of steam around all surfaces of the segments either formed or exposed and shall be constructed to contain the live steam with a minimum moisture loss. The use of tarpaulins or similar flexible covers will be permitted,
- 4) Provided they are kept in good repair and secured in such a manner to prevent the loss of steam and moisture. These enclosures may also provide the required weather protection if they are substantial enough to prevent wind and rain damage during pouring operations.
- 5) Steam at the jets shall be low pressure and in a standard condition. Live steam shall not be directed on the concrete, test cylinders, or forms
- 6) Such as to cause localized high temperature. During application of the steam the temperature rise within the enclosure shall not exceed 200C per hour. The curing temperature shall at no point within the enclosure exceed 650C and shall be maintained within a temperature range of
- 7) 500C to 650C until the required strength for segment handling has been obtained. Control cylinders shall be covered to prevent moisture loss and shall be placed in a location where temperature is representative of the average temperature of the

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enclosure.

- 8) Temperature recording devices that will provide an accurate continuous permanent record of the curing temperature shall be provided by the Contractor. A minimum of two temperature recording devices per casting machine will be required for checking temperature.
- 9) The steam curing shall include a gradual cooling period during which the rate of decrease in temperature shall not exceed 200C per hour. The
- 10) Steam curing cycle shall include the gradual cooling period until the temperature inside the enclosure is within $\pm 100C$ of the outside
- 11) Ambient temperature.
- 12) Curing of precast concrete (except match cast surfaces) after termination of the steam cycle shall continue by application of an approved curing compound and meet the requirements of Section 2.7. This membrane shall be applied to all exposed surfaces including segment exterior (once exposed by removal from the form).
- 13) For match-cast segments, the match-forming segment shall be exposed to the same curing environment (temperature and humidity) as the
- 14) Segment being steam cured.

(8) Finishing Concrete


All surfaces of segments and precast components except the roadway surface of superstructure segments shall meet the finish requirements as defined in Section 2.4. Minor breakage, spalling, or honeycomb (not over 25 mm deep) shall be repaired by a method approved by the Engineer.

Major breakage or honeycomb will be subject to review by the Engineer. These areas may be repaired by a method approved by the Engineer if he determines that the structural or other functions of the segment will not be impaired. For cast-in-place construction, breakage, spalling or honeycomb on any mating surface of an in-place segment otherwise found acceptable, shall be repaired prior to casting the next segment. For precast segments, no surface finishing or repairs shall be performed on the matching joint surface until after final erection of the segment.

(9) Finish Roadway Surface of Superstructure Box Girder Segments

As soon as the concrete has been placed and vibrated in a section of sufficient width to permit working, the surface shall be approximately leveled, struck off and screeded such that a slight excess of concrete is carried out ahead of the screed to insure filling of all low spots. The screed shall be designed rigid enough to hold true to shape. A hydraulically driven, bare steel tube rotating in the opposite direction of travel may be used if heavy enough to prevent undue distortion.

The longitudinal screed shall be moved back and forth across the concrete while one end rests on the upper surface of the form (bulkhead) and the other end on the match-cast segment. The surface of the concrete shall be screeded a sufficient number of times, and at such

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intervals to produce a uniform surface, true to grade and free of voids. The screeded surface shall be worked to a smooth finish with a long handled wood or metal float of the proper size, or hand floated from bridges over the top slab.

After the water sheen has disappeared from the surface of the top slab, but while the concrete is still plastic, the final finish shall be applied to the top slab. The final finish shall consist of a U1 finish as specified in Section 2.4

Only minimum hand finishing will be permitted and when the Engineer deems the slab surface is being overworked all hand finishing will be stopped. Only minimal amounts of water will be allowed to aid in the finishing process when evaporation rates effect the quality of the finish. A fog spray shall be used to help retard surface evaporation, but shall not change the water-cement ratio at the deck surface. During periods of excessive drying, a cover of wet burlap or plastic sheeting will be maintained on the slab at all times until final cure cover is placed.

Monomolecular film coating applied to the surface of the slab to retain moisture may be used, provided they effectively retard surface evaporation and are adequately maintained throughout the finishing operation.

The bridge deck and approach slabs shall be subjected to smoothness tests using the Rainhart Profilograph and a Profile Index Value determined in accordance with test method entitled "Determining Profile Index Value using the Rainhart Profilograph". Profiles will be obtained by the Engineer to within 2 m of the barrier of curb line. The profile index shall not exceed 12 for each wheel path and individual bumps or depressions shall not exceed 3 mm from the 5 mm blanking band. In addition, the surface shall meet a 5 mm in a 3 m straight edge check made transversely across the deck.

When no other surface treatment is intended, deck and approach slabs not meeting the above requirements shall be corrected at the Contractor's expense. The Contractor shall provide the Engineer a written plan of corrective action for approval before implementation. Approval of the corrective plan will in no way relieve the Contractor of responsibility for meeting readability requirements. In all cases a minimum of 40 mm of cover over reinforcing steel will be maintained.

After corrective action, all decks and approach slabs will be subject to retesting with profilograph to insure compliance with specifications.

Expansion joint installation shall be delayed and the joint temporarily bridged to facilitate operation of the profilograph and corrective equipment across the joint wherever feasible.


It shall be the Contractor's responsibility to schedule profilograph testing. Requests for testing shall be made at least five days prior to need. The Contractor shall insure that the area to be tested has been cleaned and cleared of all obstructions.

(10) Precast Segment Handling, Storage, and Shipment

1) General

It is the intent of this Contract that the Contractor shall provide precast segments that are cast and placed into the structure with zero defects.

Care shall be exercised in the handling of segments to prevent damage to them. Handling shall

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be done only by using the devices shown on the approved shop drawings for this purpose. Lifting devices incorporated into any segment shall be adequate to distribute the handling and erection stresses so as not to damage the segment.

The Contractor shall inspect each segment visually for evidence of damage or defect before, during and after critical operations and as often as necessary to ensure adequate quality control.

The Contractor shall immediately bring all such evidence of damage or defect to the attention of the Engineer. The extent and frequency of inspection by the Engineer for quality assurance is the Engineer's prerogative. Segments may be inspected at any time during construction as deemed necessary by the Engineer to monitor compliance with this specification.

Superstructure segments shall be stored level in the deck upright position and shall be firmly supported on a bearing system under the webs at the locations shown on the shop drawings, unless otherwise noted on the plans. The storage area of the segments shall be of suitable stability to prevent differential settlement of the segment supports, which results in an unstable storage condition during the entire period of storage.

The Contractor may request to vertically stack segments in the deck upright position provided he submits completed details of his stacking procedure and calculations substantiating that the segments will not be damaged or distressed by such stacking. The submittal shall be signed and sealed by the Contractor's Engineer. In no case will stacking be permitted more than two high in a system, which induces forces in the lower segments. Any evidence of damage or distress, as determined by the Engineer, resulting from stacking of segments shall be cause for immediate discontinuance of this practice.

Prior to shipment, each segment shall be inspected for damage. The faces of all match cast joints shall be thoroughly cleaned of laitance, bond breaking compound and any other foreign material by wire brushing or light sandblasting. During transport, firm support at the bearing locations noted above for support during storage shall be provided and the segments shall be fully secured against shifting. Upon arrival at the erection site, each segment shall again be inspected.


If any damage has occurred during shipment, the Contractor shall immediately notify the Engineer. Erection of such damaged segments into the structure shall not proceed without authorization from the Engineer.

2) Damaged or Defective Segments

Isolated defects are defects or damage, which occur randomly and infrequently, as determined by the Engineer.

Recurring defects are defects or damages of the same general type and nature, which continue to be found in the same general location of the segments at an unacceptable frequency, as determined by the Engineer.

As a minimum, the first five segments cast and the first five segments erected will be jointly inspected by the Engineer, the Contractor and the Contractor's Engineer after casting, after moving to storage from the casting machine, and before and after erection. All segment

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defects shall be identified and categorized during this inspection. The Contractor and Contractor's

Engineer shall examine the defects and propose to the Engineer, in writing:

- a. The measures that the contractor shall take to prevent recurring defects in future segments.
- b. The method of repair of all defects discovered as a result of the inspection as required herein.

If recurring defects continue following implementation of the Contractor's preventive measures, or as detected at any time during the construction, the Engineer will instruct the Contractor, in writing, to cease operations producing such defective segments. The Contractor and Contractor's Engineer shall examine the defects and propose to the Engineer, in writing:

(1) The measures the Contractor shall take to prevent recurring defects in future segments, and (2) the method of repair of all defects discovered as a result of the inspection as required herein.

The Engineer will determine what constitutes damage or defect, whether the damage or defect is isolated or recurring, and will categorize the damage or defects. Three categories of defects are recognized by the Engineer for this purpose:

a. Cosmetic: Cosmetic defects or damages are those which do not affect the ability of the segment to resist construction or service loads or reduce the life expectancy of the structure. This category of defect includes a superficial discontinuity such as cracks, small spalls or honeycombed areas, or any defect that does not extend beyond the centreline of any reinforcing steel, or to any elements of the post tensioning system. Cosmetic defects of other types and causes may also be designated by the Engineer.

Repair of cosmetic defects shall be made in such a manner that the aesthetics and the structural integrity of the segments is restored.


b. Structural: This category of defect shall include any defect which will impair ability of the segment to adequately resist construction or service loads or reduce the life expectancy of the structure. Any defect or damage, which extends beyond the centreline of any reinforcing steel or into any element of the post-tensioning system or occurs in the deck portion of the segment, is considered a structural defect.

Examples of such defects include cracks, large spalls and honeycombed areas, major segregation or breakage of concrete; however, structural defects of other types and causes may be designated by the Engineer.

The Contractor's Engineer shall be responsible for construction load analysis, service load analyses and life expectancy determinations.

Repair of structural defects shall be such that the aesthetics and structural integrity of the segment shall be completely restored to a condition to be expected had the defect or damage not occurred.

c. Rejectable: a rejectable defect is any defect or damage, as determined by the Engineer,

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which will impair the ability of the segment to adequately resist service loads or construction loads, or will reduce the life expectancy of the structure and which cannot be successfully repaired such that the structural integrity is completely restored. Any segment with a rejectable defect will be deemed unacceptable and shall be removed from the work and replaced at no additional cost.

Damaged or defective segments may also be rejected by the Engineer for the following reasons:

- i. Failure of the Contractor's Engineer to approve proposed repair procedures.
- ii. Failure of the Contractor to execute the repair according to the Contractor's Engineer's approved procedure.
- iii. Rejection of the proposed repair procedure on repair by the Engineer.
- iv. Failure of the Contractor to provide the required certification or demonstration that the repair was successful and that the defect no longer exists, as required below;
- v. Failure of the Contractor to eliminate recurring defects.

d) Determination by the Engineer that the work or materials used in the work does not meet other requirements of the Contract Documents and is not acceptable.


Segments with structural defects will not be paid for until the repair procedure is complete and the segment is certified or demonstrated to be free of structural defect as required.

(11) Repairs

Cosmetic repairs shall only be made following procedures prepared by the Contractor, submitted in writing to and approved by the Engineer. The Contractor's repair procedure shall identify those areas required to be repaired prior to post tensioning, and those that must be repaired after posttensioning.

Structural repairs shall be made following procedures prepared by the Contractor. The repair procedure shall be signed and scaled by the Contractor's Engineer, shall be submitted in writing to the Engineer, and shall include the following minimum information.

- 1) A detailed description and sketch of the defect.
- 2) The magnitude and type of the most critical construction loading and service life condition to which the defective area will be subjected.
- 3) Detailed reinforcement requirements, material types, surface treatments, curing methods and general repair procedures proposed. The procedure shall clearly indicate those areas required to be repaired before erection, and those areas to be repaired after erection.
- 4) The specific non-destructive testing method and procedure by which the Contractor shall demonstrate to the Engineer that the defect no longer exists and the segment has been restored to a condition to be expected had the defect or damage not occurred. In lieu of physical demonstration, on a case-by-case basis, the Engineer may allow the Contractor to substitute a written certification by the Contractor's Engineer that the repair has been performed satisfactorily and that the defect no longer exists. This work shall not be the basis for any request for extension of time or additional compensation.

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(12) Shear Key Repairs

Repairs to the shear keys along the webs shall be made after the segments have been erected. When 20 percent or more of the shear keys in a web have been damaged such that they cannot effectively transfer the shear across the joint, as determined by the Engineer, then the damaged shear keys shall be repaired after the segments have been erected and initially stressed together with no more than 10 percent of the final prestressing force applied across the joint. After the repair has been completed and obtained a minimum characteristic compressive strength of 32 MPa, the final prestressing force may be applied across the joint.

(13) Erection

1. General

An erection scheme for handling and erecting segments is shown in the plans. The erection scheme is a concept only, consistent with the overall bridge design. It is presented to aid the contractor in developing his method of construction, which is also to be consistent with the Overall bridge design. The Contractor shall be solely responsible for design, fabrication, assembly and operation of all equipment to be used for handling and erecting segments.

Erection of segments shall not begin until the required shop drawings calculations have been reviewed and approved by the Engineer. No extra payment will be made to the Contractor for any cost incurred in modifying the permanent structure due to temporary loadings induced By the Contractor's handling and erection equipment or his erection scheme.

Elevations and alignment of segments shall be carefully measured at each stage of erection with instruments capable of providing the degree Of accuracy necessary to assure that erection tolerances will be met. Any deviation from the table of elevations and alignment prepared by the Contractor shall be corrected so as to prevent accumulation of deviations using a method submitted by the Contractor and approved by the Engineer.

2. Age of Precast Segments at Time of Erection

Precast segments shall not be erected until they have reached the age of 14 days and have obtained the minimum specified strength in the plans.


3. Temperature of Precast Segments with Epoxy Joints

Erection of segments will be permitted only when the substrate temperatures of the mating surfaces are between 50C and 400C. Upon Notice by the Engineer, an artificial environment may be provided to maintain the substrate temperature within the permissible limits by creating an enclosure heated by circulating warm air or by radiant heaters. Localized heating shall be avoided and the heat shall be provided in a manner that prevents surface temperatures greater than 350C during the epoxy hardening period. Direct flame heating of concrete will not be permitted.

(14) Tolerances

The following tolerances shall apply to erection of superstructure segments:

- 1) The maximum differential between the outside face of adjacent segment in the erected position shall not exceed 5 mm.
- 2) 2) Transversely, the angular deviation from the theoretical slope difference between two

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successive segment joints shall not exceed 0.001 Rad.

- 3) Longitudinally, the angular deviation from the theoretical slope change between two successive segments shall not exceed 0.003 Rad.
- 4) The difference in roadway elevation at the connection of two adjacent segments (measured perpendicular to the deck surface) and across closure joints shall be no greater than 3mm. If the Contractor fails to meet the tolerance, he shall grind the deck surface to meet the tolerance and re-groove the deck. All corrective work shall be at the Contractor's expense.
- 5) The horizontal and vertical position of a pier segment (superstructure segment which rests on a pier) shall be within 6mm of the longitudinal alignment, grade and cross-slope required by the approved erection plans. The longitudinal slope shall not vary more than 2mm in 3m from that required by the approved erection plans. These tolerances are for relative location of control point's not absolute location.
- 6) Dimensions from segment to segment shall be adjusted so as to compensate for any deviations within a single segment so that the overall dimensions of the completed structure will conform to the dimensions shown on the plans such that the accumulated maximum error should not exceed 1/1000 of the span length for either vertical profile and/or horizontal alignment. Deviations exceeding the erection tolerances listed above which are discovered during the match-casting operation shall be identified by after-cast surveys at the casting site before the matched-castings are separated. Corrections for these deviations shall be submitted to the Engineer prior to casting the next match-cast segment or in the cast-in-place closure pours.


(15) Special Requirements – Erection of Precast Segments by Cantilever Method

During erection by the cantilever method, the unbalanced load shall not exceed that shown in the erection drawings scheme included in the plans.

Accurate positioning of the segments comprising the pier table is very important as it will establish the line and grade for cantilevers in each direction. Each pier table must be positioned according to the final longitudinal alignment, grade and cross-slope. Further erection shall not continue until these segments of the pier table are properly tied down to the piers by the means provided. The horizontal and vertical alignment of the pier table shall be within 3mm of that required by the approved erection plans.

The alignment and elevations of the cantilevers shall be checked by the Contractor and the Engineer, independently, within one hour of sunrise on each day that segments are to be erected. The measurements made by the Engineer and the Contractor shall agree to within 6mm.

If measured elevations deviated from the table of elevations, the Engineer shall have the right to suspend further erection of superstructure segments until the cause of the deviation is discovered and a corrective action plan, submitted by the Contractor, is approved by the Engineer. No additional payment or time will be made to the Contractor as a result of this suspension for unacceptable erection deviation.

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(16) Epoxy Jointing of Precast Segments

A. Epoxy material placement, inspection, and testing shall be in accordance with AASHTO Materials Specification M235, AASHTO Standard Specifications for Highway Bridges, Division II, Construction, Sections 8.13.7 and these Special Provisions.

B. Application and Amount of Epoxy: The application shall begin immediately after a batch has been mixed. The epoxy bonding agent shall be applied in accordance with the manufacturer's recommendations by spatula or gloved hand to completely and uniformly cover one of the faces to be joined to a nominal thickness of 2 mm, except that in the vicinity of internal posttensioning ducts, it shall be applied to both surfaces to a nominal thickness of 1 mm. Epoxy shall not be applied to either face within 12 mm of post-tensioning ducts, conduits or outside edges except that, regardless of spacing, a bead of epoxy shall be applied between each and all posttensioning ducts and conduits.

The amount of epoxy may be adjusted providing that a sufficient amount is applied to completely fill the interstitial space in the joint and to extrude a small bead from the joint after application of the compressive contact pressure. If a bead of epoxy is not extruded all around the joint, the joint may have to be pressure injected with epoxy or other remedial measures may have to be taken after all internal post-tensioning tendons have been grouted. When epoxy is applied in conjunction with layers of woven glass matting and high density plastic or other approved material for the purpose of shimming a joint to correct alignment, then a proposal detailing the areas and layers of matting, amounts of epoxy, and operational procedures shall be submitted to the Engineer for review and approval prior to implementation.


Application of epoxy bonding agent to the segment joints after combining the components shall follow the manufacturer's recommendations.

C. Closing Segment Joints: Immediately after the segment joint is covered with epoxy bonding agent, the segments shall be brought together and the specified compressive contact pressure applied in accordance with the approved erection procedures. A discernible bead line of extruded epoxy shall be apparent along the exposed edges of the joint or remedial measures such as epoxy injection may have to be taken as required by the Engineer.

D. Failure to Comply with Time Limits: The Contractor shall plan his post-tensioning operations so that the time elapsing between mixing of the components of the first batch of epoxy bonding agent applied to the segment joint and application of a compressive force averaging not less than 0.28 MPa over the entire joint does not exceed the manufacturer's recommendations. If this time limit is exceeded, the concrete segments shall be moved apart and all epoxy bonding agent shall be removed from both faces of the joint. If solvent is used to remove the epoxy bonding agent, re-application of epoxy to the joint surfaces shall not occur until solvent has dissipated and as approved by the Engineer.

E. Record of Jointing: The Contractor shall keep a record of each joint with the following details:

1. Segment, span, and joint numbers

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2. Date and time of jointing
3. Batch number for resin and hardener
4. Maximum temperature of the mix
5. Weather conditions (temperature and humidity recorded at 15 minutes intervals)
6. Details of samples
- (17) Closure Joints

Concrete for closure joints shall comply with the same specifications and criteria as the concrete in the segments and shall be included in the quantities and unit cost of precast prestressed segmental concrete box girder. Concrete shall reach the minimum required strength as shown on the plans or in the Specifications prior to stressing the longitudinal post-tensioning. Formwork shall be adequately supported to take all loads applied and they shall not be removed until the concrete in the joints has reached its required strength and longitudinal tendons have been stressed.

(18) Final Clean Up


Before final acceptance, the Contractor shall clean the interior of the concrete box girders of all rubbish, excess materials, loose concrete, dirt and debris. The interior of the box girders shall then be swept out. The final clean up shall be performed after all work on the interior of the box girders, including grouting of all tendons and electric work, has

7.16 Precast Construction

- i. While designing precast elements/structure, aspects of durability and minimum maintenance shall be kept in view.
- ii. Precast panel / girders and cast-in-situ slab construction shall be designed as composite construction.
- iii. Cross pre stressing of deck is not permitted. However, transverse pre stressing of end diaphragms is permitted.
- iv. In precast construction, the performance of joints is especially critical for the integrity of a structural system. The geometric configurations of a joint, in addition to the selection of an appropriate interface material contribute to the proper short-term and long-term performance of the structure. The design of joints shall allow for movements due to shrinkage, thermal effects and possible differential settlements.
- v. Two lane of single PSC segmental box girder superstructure shall be mandatory. The shape of superstructure shall be as shown in the tender drawing and as approved by the Engineer's representative.

7.17 Steel Superstructure.

- i. Detailed design & drawing of steel superstructure shall be as per relevant IRC / IRS / IS codes.
- ii. Fabrication / Shop drawings shall be prepared based on design drawings & got approved from Engineer before start of actual fabrication work.
- iii. As far as possible field / site welding shall be avoided. In unavoidable

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circumstances, approval for the same shall be taken from Engineer.

- iv. Erection stresses on steel structure shall be as per IRC 6-2017.
- v. The effect of Pre camber & deflection shall be worked out & provided during fabrication of steel superstructure.

8.0 SPECIFIC REQUIREMENTS

8.1 Reinforced

Concrete

1. Concrete Grades

All the concrete to be used in the Works shall be of a minimum of Grade 20 MPa, and the minimum concrete grades to be used for components of the bridge shall be as per the following table.

Table-2: Concrete Grades

Structural Elements	Minimum Grade (MPa)
Concrete for Open Footing/bored pile/Pile caps	M-45
Piers, pier cap	M-60
PSC Spine Wing Segmental Box Girder/PSC Segmental Box Girder/ PSC –I Girder	M-60
Parapets, Approaches slab, pedestals and Median	M-45
Levelling course. P.C.C.	M-20

2. Density of Concrete

Mass concrete - 24 kN/m³
Reinforced/ prestress concrete –
25kN/m³
Green Concrete - 26 kN/m³

3. Elastic Modulus of Concrete

Elastic modulus of concrete for short term & long term shall be calculated depending upon the shrinkage & creep parameter as specified in IRC 112:2020.


4. Shrinkage

Shrinkage shall be calculated as per IRC 112:2020. The value of total shrinkage strain ϵ_{cs} is given by:

$\epsilon_{cs} = \epsilon_{cd} + \epsilon_{ca}$
Where,
 ϵ_{cd} = drying shrinkage strain
 ϵ_{ca} = autogenously shrinkage strain.

5. Creep

The creep shall be calculated as per IRC: 112-2020. The creep coefficient,

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$$\phi = \sigma_{cc}(t) / \sigma_{ci}(t),$$

Where, $\sigma_{cc}(t)$ is the creep strain at $t > t_0$, $\sigma_{ci}(t)$ is the initial strain at loading.

6. Exposure Condition

Very severe exposure conditions shall be considered while designing various components of the bridge and other structures in the viaduct portion and extreme conditions shall be considered in the structures lying in intertidal zone. For durability conditions the provisions stated in section 14 of IRC: 112-2020 shall be followed.

7. Cover to Reinforcement & Crack Width

For the targeted service life of 100 years, the durability recommendation given under Clause 14 of IRC:112-2020 for “extreme condition” for structures lying in intertidal zone and for land viaduct prone under “very severe” condition shall be modified as given in the following table.

Table-3: Cover to Reinforcement and Crack Width

Elements	IRC Exposure Category	Max. Crack Width (mm)	Nominal Cover for Crack Width Determination (mm)	Actual Cover (for Durability) (mm)
Piles, Foundations	Severe	0.3	45	75
Pile caps	Extreme	0.2	45	75
Pier, Abutments, Pier Cap, Abutment cap, Wing wall etc.	Very Severe	0.2	30	50
Prestressed Concrete Decks, Approach slab, RCC crash Barrier & other RCC works	Very Severe	0.2	30	50

For post tensioned tendons, the minimum clear cover measured from the outside of the sheathing shall be 75 mm.

8. Coefficient of Thermal Expansion

The following values shall be adopted as coefficient of thermal expansion for reinforced cement Concrete: $12 \times 10^{-6} / ^\circ\text{C}$.


9. Reinforcement

HYSD reinforcement bars of grade Fe 500 conforming to IS: 1786 and IRC: 112-2020 shall be adopted.

Young's Modulus: $E_s = 200,000 \text{ MPa}$; Yield Stress: $f_y = 500 \text{ MPa}$.

10. Structural Steel (Steel Superstructure)

Composite Steel girder, grade of steel shall be E410 (Grade A, Tensile strength 540 MPa). Structural steel shall conform to IS: 2062 (2011) – grade – A (Weldable quality) unless specified otherwise.

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11. Pre stressing Steel

The pre stressing system used shall be VSL system or DSI system or any other equivalent approved system.

The following are defined for the pre stressing system: -

- Multi-strand system comprising the required number of strands in a circular duct.
- Anchorage and coupling system for the anchoring of the pre stressing forces at the ends or for continuing the force by coupling.
- Internal tendons comprising of High-Density Polyethylene (HDPE) sheathing around the strands of bars, external to the concrete shall be used. Once the force is locked off, the orifice is filled with cementitious grout for corrosion protection as well as for bonding of the strands to the concrete to form a bonded system.

For pre stressing strands, 7 wire low-relaxation strands complying with IS: 14268-1995 or IRC112-2020 whichever appropriate, will be used. The following strand types are proposed to be used on the project according to the details and design requirements for various structure types.

Table-4: Pre stressing Strand Details

Material property	Normal Strands
Strand Type	Uncoated stress relieved low relaxation Class II conforming to IS 14268
Yield strength (MPa)	1560
Ultimate strength (MPa)	1770
The breaking strength	0.2 % proof load
Young's Modulus (GPa)	195
Relaxation (After 1000h)	Maximum 4.5%

9.0 BEARINGS


- In conformance to IRC: 83 (Part II) for elastomeric bearings; IRC: 83 (Part III) for POT-PTFE bearings; IRC: 83 (Part IV) for Spherical Bearings and MoRTH specifications.
- Cut / Segmental roller bearings shall not be permitted.
- The bearings shall be easily accessible for inspection.

10.0 EXPANSION JOINT TYPE:

The expansion joints shall conform to MoRTH specifications. The detailed working drawing for the joint shall be in conformity with overall geometry of deck. Geometrical profile shall be achieved by adjusting the dimensions of Superstructure. Only strip seal / modular strip seal joints shall be permitted.

11.0 WATER SPOUTS:

Water spouts as per MoRTH type design no. SD/303 shall be provided. However, the

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diameter of GI pipe shall be 150mm. These shall be spaced at not more than 3.0m C/C or as per hydraulic design calculations

12.0 WEARING COAT:

A wearing coat of uniform thickness shall be provided for riding surface. It shall consist of 50mm thick Dense Bituminous Macadam covered by 25 mm thick Mastic (Manual preferred) and 06 mm thick water proofing layer over the deck slab.


13.0 ANTICORROSIVE TREATMENT TO CONCRETE AND REINFORCEMENT:

Anticorrosive treatment for concrete & reinforcement shall be based on relevant IRC provision expect as below.

- a. All exposed surface of concrete for viaduct (expect steel superstructure) & Ramp (RE Panels) shall be painted with Anti-carbonate acrylic paint.
- b. Mild steel liner to piles shall have one coat of zinc-rich epoxy primer and two coats of coal tar epoxy.
- c. Part of substructure & foundation below GL in contact with earth – one coat of primer as above and two coats of coal tar epoxy.
- d. Anti-corrosive treatment to reinforced steel for concrete used for foundation work and below M-45 grade shall be of Fusion Bounded Epoxy Coating (FBEC) type as specified. The anchorage / bond length in case of FBEC bars shall be increased by as per provision specified in IRC codes.
- e. For Steel Superstructure – Acrylic Aliphatic Coat – 75 microns, Epoxy MIO (Mid Coat) – 100 microns & Primer Coat of Zinc Silicate (Bas Coat) – 35 microns
- f. Enamel paint for all kerbs / Anti crash barrier / Pier protection as per approved aesthetic colour in 3 coats and as directed by the engineer.
- i. Entire structure shall be given anti corrosive protective paint, which shall be got tested from approved laboratory and shall be of approved quality, color and shade.

14.0 PROOF CHECKING OF INNOVATIVE DESIGN & LOAD TEST FOR INNOVATIVE DESIGN.

- 1) The Contractor shall get curve structural steel span design proof checked from IIT Mumbai in addition to the proof checking by consultants appointed by NMMC. Contractor also to carryout model and/or load testing of the structure or component to prove its suitability. The cost of such test shall be borne by the Employer if the test results are satisfactory. In case the test results are not satisfactory, the cost of testing shall be entirely borne by the Contractor.
- 2) Any defect noticed in the structure or any damage done to the Bridge at the time of testing which affects or is likely to affect the strength of the Bridge shall be rectified by Contractor at his own cost by remedial measures or replacement as approved by the Engineer.

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15.0 ELECTRICAL WORK / STREET LIGHTING AND LANDSCAPING:

The scope under the present Contract covers providing and fixing following items as per international practice conforming to relevant Indian Standards. Items to be finalized under lump sum cost.

- 1) Junction boxes, pullout boxes.
- 2) Sleeves, base plate and anchor bolt for fixing electrical poles.
- 3) Provide 110 mm \square Double Wall Corrugated (DWC) pipe of PE with IS mark, one in each crash barrier for entire length of Elevated Road interchange and up to nearest junction box.
- 4) Providing 110 mm \square Double Wall Corrugated (DWC) pipe of PE with IS mark 4 Nos. in median for entire length of Elevated Road interchange and up to nearest junction box.
- 5) All the material shall be new and confirm to latest IS Specification and shall be procured from approved manufacturer only.
- 6) Providing and fixing galvanized hexagonal electrical poles, flamingo shape poles along with complete fixtures and lights of appropriate lux for the throughout the length on bridge and road below the bridge which shall be as per IRC standards and have to be approved or acceptable by the local competent authority/NMMC prior to procurement and fixing.
- 7) Lighting above & below the bridge shall be carried out with appropriate fitting and illumination.
- 8) The Contractor shall carry out and complete the said work (including labour, material, appliances, equipment etc.) under this contract in every respect in conformity with current rules & regulations of local electricity authority, Indian Standards Institution and with the directions and to the satisfaction of the Engineer Representative.

16.0 PROCEDURE FOR CHECKING DETAILED CALCULATIONS AND WORKING DRAWINGS:


- 1) Within 15 days of the receipt of work order, the Contractor shall submit a program of submission of designs. The program of submission of designs of various components should be consistent with the program of work prepared by the Contractor and approved by the Engineer.
- 2) The design consultant shall have the latest official version of the software being used for design and the same shall be made available for scrutiny of design to the Engineer if demanded.
- 3) Detailed design calculations and working drawings of all the component parts of the Bridge shall be submitted well in advance of the execution, in accordance with the above program. Two sets of such design calculations and three sets of drawings

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accompanied by complete information and sufficient data shall be submitted to the Engineer for checking the design calculations. The designs and drawings for various components parts shall be submitted progressively.

If computer is used for design or analysis, the Contractor shall submit with design, the detailed description of method of analysis with explanatory notes and manually done sample calculations for adequate number of typical cases & soft copy. The Computer Program as submitted will be further tested by comparison with solutions of worked examples. After awarding of work the contractor should submit a note giving his design approach and construction scheme conforming to the requirements which should be approved by the authorities so as to avoid the possibility of major changes being required in the design at a later stage.


- 4) Drawings and designs shall be in metric units. Calculations shall be neat and clear and supplemented by full explanatory notes and sketches wherever required. The drawings of initial submissions and final approval shall be stenciled and in 420 mm x 297 mm size only. It is entirely the responsibility of the Contractor to submit the design in good time to enable the Engineer to approve them in time. No claims shall be granted on account of late approval to the design and consequent delay in the execution. Schedule of reinforcement and rate of reinforcement per cum of concrete quantity (and also percentage with respect to gross cross sectional area of the component) should also be shown on each drawing.
- 5) Nine sets of approved working drawings along with one soft copy in the form of Compact Disk and four sets of approved design calculations shall then be supplied by the Contractor which will be formally authenticated by the Engineer. These drawings shall be submitted in plastic folders for each set and calculations in plastic files & bag.
- 6) After completion of each stage of work, three sets of record plans based on the work as actually executed on site, shall be supplied by the Contractor, to the Engineer.
- 7) Approval to drawings and designs and design calculations by the Engineer shall not in any way relieve the Contractor of his responsibility for the correctness, soundness and structural stability and safety of the structure.
- 8) The approved drawings and the design calculations of the Bridge shall be the property of the Employer.
- 9) The Contractor's designer or Consultant shall attend all the design review meeting conducted by Employer Personnel from time to time, without any extra cost.

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17.0 DOCUMENTATION, INSTRUMENTATION:

The following items are deemed to be included in the tender cost.

- 1) All final drawings and Compact Disc of all approved drawings and tracing films of “as built” drawings and calculations shall be supplied by the Contractor in triplicate.
- 2) Three copies of DVD of 180-minute duration each of the Bridge covering the different phases of construction from start to finish shall be supplied by the Contractor.
- 3) A “Maintenance Manual” describing access arrangements, important obligatory precautions from the point of view of structural safety, and procedure for minor and major repairs of each component of the Bridge, renewals of finishes and periodical treatment shall be supplied in ten copies and on Compact Disc/ DVD by the Contractor.
- 4) A “Quality Assurance Manual” covering designs and drawings, mix design, materials, testing, soil and rock properties, statistical quality control, etc. shall be prepared by the Contractor well before starting the work.
- 5) A “Project Report” covering various aspects of construction methods, difficulties faced and how they are overcome during execution etc. shall be supplied by the contractor at the time of finalization of work.
- 6) The Contractor shall install fixtures and fastenings provided by the department for housing any instrumentation that may be useful for Employer at his cost.

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Section – II Details of Utilities

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DETAILS OF UTILITIES/ CONSTRAINTS

Details of utilities passing through the project corridor will have to be mapped by the contractor. Some of the utilities are likely to cause hindrance of the foundations. These utilities are needed to be relocated or diverted before taking up the piling/ foundation work. These operations need to be done consultation with utility providers.


In case utility relocation / diversion is not feasible, the number of piles, size & shape of substructure shall be suitably adopted. For these design and construction, any additional / extra payment will not be made and it is deemed to be included in lump sum offer quoted by the Bidder in relevant item of billing schedule.

Contractor is advised to use to his own national / international practices of tracing out or locating these utilities below the ground at no cost to the Employer.


1. Sewer and Water Mains.
2. Storm Water Drains
3. Telecom and Optical Fiber Cable lines
4. HT / LT lines/ Underground Electrical Cables.

Contractor shall obtain necessary permits/ approvals from the respective utility providers well in advance of starting of shifting work and under supervision of the utility owner. The shifting works shall be carried out through the authorized sub- contractors of utility providers without causing inconvenience to the utility users at large and under supervision of the utility owner.

Ancillary work such as Reinstating Road Surface including paver blocks, kerbs, medians etc. when disturbed during the construction shall be reinstated as per the direction of the Engineer. Considering above Ancillary works as no any extra payment to be made to the contractor for such type of works.

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Section – III Project Specific Requirements

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1. General


- a. Special provisions in the detailed specifications or wording of any item shall have precedence over the corresponding contract provisions, if any, in the standard specifications of the MoRT&H, PWD etc. In case of any contradictions in the specifications, the interpretation and decisions of the Engineer shall be final and binding.
- b. Wherever, contractor has to obtain permissions/sanction from various local authorities, NMMC will extend necessary assistance by writing letter to concerned authorities.
- c. Customs & Excise Duty: No Customs and Excise exemption certificate for procurement of construction equipment, machinery, goods, etc will be issued by the Employer.
- d. Contractor shall be required to observe the restrictions on working hours, if imposed by local authorities and police.
- e. If NMMC does not remove encroachment / acquire the land of this work then the corresponding work would be treated spilled over to next mile stone and construction programme revised.

In case the removal/encroachment/acquisition of land/handing over of land has been impossible for one or other reason up to the contract period the corresponding work shall be withdrawn at the request of the contractor. In such cases no compensation shall be payable on account of idling of machinery, manpower etc. however the contractor if so desire may continue with the affected work for which proportionate extension will be granted. No claims shall be entertained by the dept. on account of phasing of such work either on account of idling of equipment/machinery or men.


2. Work Specific

Extent use of crushed sand is allowed then percentage of crushed sand needs to be decided on the basis of design mix and test for flexural strength carried out conforming to the specification. Crush sand may be used, provided the finishing and workability etc. are not affected at any location and also provided that the gradation is maintained and is conforming to latest version of IS 383. No extra payment to be made to the Contractor for setting up of factory etc. for the manufacture of above said sand with all leads.

- a. Contractors shall obtain sanction to his construction methodology and method statement in respect of work of the Bridge from NMMC/Consultants appointed by NMMC.

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- b. Any damage caused to either private or public property, services, structures etc. shall be made good by contractor without any extra cost to the employer
- c. Suitable traffic diversion measures will have to be adopted in consultation with Engineer and traffic Police. To ensure traffic safety proper and adequate signboards, sound quality strong barricades made of structural steel for complete site of execution with blinkers / lamps etc., lighting at night shall be displayed during day and night to ensure that no accidents take place.
- d. Suitable phasing of construction and temporary traffic arrangement shall be got approved from the Engineer. No compensation for any delay in intended date of completion shall be payable to the contractor
- e. Contractor shall submit Quality Assurance plan based on ISO 9000 series document to form the basis evolving the quality system, applicable for all quality related activities.
- f. Sand as per IS: 383 shall be used in the work.
- g. No excavated material (including the material to be reused after checking the conformity to required standards for any purpose and with prior permission of the Engineer) shall be dumped in the creek. The same shall be immediately disposed of as directed by Engineer.
- h. Whenever new drains are constructed the flow in the old drain will have to be suitably diverted to maintain the continuity of flow. The item rate for demolition of drain shall be deemed to contain the cost of such diversions & will not be paid separately.
- i. Whenever embankment/widening is done it will be necessary to ensure the compactions of small width towards edge of widening shall be done by mobilizing 3 tonne power roller/static roller & percentage compaction as stipulated in the item shall be achieved. This will be necessary in the situation where the vibratory roller of 10 tonne cannot approach edges due to site condition.
- j. Wherever kerbs/median kerbs are to be fixed on existing pavement (concrete/bituminous) necessary drilling, cutting and anchoring shall be carried out by the contractor at his own cost. Laying of kerb/median parapet wall etc. shall be done by kerb laying machine only except where permitted otherwise by the Engineer.
- k. Ancillary work such as Reinstating Road Surface including paver blocks, kerbs, medians etc. when disturbed during the construction shall be reinstated by the contractor at his own cost as per the direction of the Engineer.
- l. Scope of maintenance during defect liability period including maintenance of electrical items

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shall be carried out as per the direction of the Engineer.


3. Shifting of utilities

- a. Contractor is required to liaison with concerned department for identifying exact location of the utility services. Any damages by the contractor while carrying out work to the utilities shall be repaired at his own cost.
- b. Deposits /Supervision charges levied by Govt. dept. & paid by the contractor for the purpose of shifting of utilities (under Provisional Sums) shall be reimbursable after due assessment, verification and scrutiny except for street light poles, set of signal poles, road signs/sign boards & consumer connection for water connections (Domestic/commercial) etc.

4. Material Specific: -


TMT / HYSD BARS MANUFACTURER

- TMT / HYSD manufacture shall be having Iron Making Facility using Iron Ore as basic raw material, along with the sponge iron plant & necessary refining facility shall be in-house.
Or
Billets used for the TMT / HYSD rolling shall be procured from the plant having Iron Making Facility using Iron Ore as basic raw material, along with the sponge iron plant & necessary refining facility shall be in-house.
- TMT bar manufacture shall be having the valid BIS license along with the Testing facility of Chemical & Mechanical properties.


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Section – IV General Conditions of Contract


GENERAL CONDITIONS OF CONTRACT PART - I <u>INTERPRETATIONS AND DEFINITIONS</u>		
1	Singular And Plural.	Where The Context So Requires, Words Importing The Singular Shall Also Mean The Plural And Vice Versa.
2.	Gender	Words Importing The Masculine Gender Shall Also Include The Feminine Gender.
3.	Definitions	<p>(a) ‘Corporation’ Shall Mean Navi Mumbai Municipal Corporation As Incorporated Under The BPMC Act, 1949.</p> <p>(b) The ‘Municipal Commissioner’ Shall Mean The Municipal Commissioner Of The Corporation, For The Time Being Holding That Office And Also His Successor And Shall Include Any Officer Authorized By Him.</p> <p>(c) The ‘Engineer’ Shall Mean The City Engineer Appointed For The Time Being Or Any Other Officer Or Officers Of The Corporation Who May Be Authorized By The Commissioner To Carry Out The Functions Of The Engineer.</p> <p>(d) ‘Engineer’s Representative’ Shall Mean Executive Engineer/ Deputy Engineer/ Sectional Engineer /Junior Engineer Or Any Other Municipal Employee Or Employees Appointed From Time To Time By The ‘Engineer’ To Perform The Duties Set Forth In Clause No.66 Hereof And Generally To Assist The Engineer For The Purpose Of The Contract And Whose Authority Shall Be Notified In Writing To The Contractor By The Engineer.</p> <p>(e) The ‘Contract’ Shall Mean The Tender And Acceptance Thereof And The Formal Agreement If Any, Executed Between The Contractor, And The Corporation Together With The Documents Referred To Therein Including These Conditions And Appendices And Any Special Conditions, The Specifications, Designs, Drawings, Price Schedules, Bills Of Quantities And Schedule Of Rates. All These Documents Taken Together Shall Be Deemed To Form One Contract And Shall Be Complementary To One Another.</p> <p>The Order Of Precedence In Case Of Discrepancies Shall Be</p>

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	<p>As Under,</p> <ol style="list-style-type: none"> 1. Contract Agreements. 2. The Letter Of Acceptance. 3. Notice Inviting Tender & Instructions To Tenderer. 4. Special Conditions Of Contract. 5. The General Conditions Of Contract. 6. Schedule Of Rates & Quantities. 7. The Technical Specifications. 8. The Drawings 9. Schedules & Annexures. <p>(f) The 'Contractor' Shall Mean The Individual Or Firm Or Company Whether Incorporated Or Not, Undertaking The Works And Shall Include Legal Representatives Of Such Individual Or Persons Composing Such Firm Or Unincorporated Company Or Successors Of Such Firm Or Company As The Case May Be And Permitted Assigns Of Such Individual Or Firm Or Company.</p> <p>(g) 'Contract Sum' Means The Sum Named In The Letter Of Acceptance Including Physical Contingencies Subject To Such Addition Thereto Or Deduction There-From As May Be Made Under The Provisions Hereinafter Contained.</p> <p>Note : The Contract Sum Shall Include The Following :-</p> <ol style="list-style-type: none"> 1. (A) In The Case Of Percentage Rate Contracts, The Estimated Value Of Works As Mentioned In The Tender Adjusted By The Contractor's Percentage. (B) In The Case Of Item Rate Contracts, The Cost Of The Work Arrived At After Extension Of The Quantities Shown In Schedule Of Items/ Quantities By The Item Rates Quoted By The Tenderer For Various Items And Summation Of The Extended Cost Of Each Item. (C) In Case Of Lump Sum Contract, The Sum For Which Tender Is Accepted. <p>2. Special Discount/ Rebate/ Trade Discount Offered By</p> <p>The Tenderer If Any And Accepted By The Corporation.</p>
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		<p>3. Additions Or Deletions That Are Accepted After Opening Of The Tenders.</p> <p>4. Physical Contingencies, If Any An Accepted By The Corporation.</p> <p>(h) ‘Excepted Risks’ Are Risks Due To Riots (Otherwise Than Among Contractors’ Employees) And Civil Commotion (In So Far As Both These Are Uninsurable), War (Whether Declared Or Not), Invasion, Act Of Foreign Enemies, Hostilities, Civil War, Rebellion, Revolution, Insurrection, Military Or Usurped Power, Any Act Of Government, Damage From Aircraft, Acts Of God, Such As Earthquake, Lightning And Unprecedented Floods And Other Causes Over Which The Contractor Has No Control And Accepted As Such By The Commissioner.</p> <p>(i) The ‘Site’ Mean The Land And Other Places, More Specifically Mentioned In The Special Conditions Of The Tender, On, Under, In Or Through Which The Works Or Temporary Works Are To Be Executed And Any Other Lands And Places Provided By The Corporation For Working Space Or Any Other Purpose As May Be Specifically Designated In The Contract As Forming Part Of The Site.</p> <p>(j) ‘Urgent Works’ Shall Mean Any Measures Which In The Opinion Of The Engineer Become Necessary During The Progress Of The Work To Obviate Any Risk Of Accident Or Failure Or Which Become Necessary For Security.</p> <p>(k) The ‘Works’ Shall Mean The Tasks To Be Executed In Accordance With The Contract Or Part(S) Thereof, As The Case May Be, And Shall Include All Extra Or Additional, Altered Or Substituted Works As Required For Performance Of The Contract.</p> <p>(l) ‘Construction Plant’ Shall Mean All Appliances Or Things Of Whatever Nature Required In Or About The Execution, Completion Or Maintenance Of The Works Or Temporary Works (As Here In After Defined) But Shall Not Include Materials Or Other</p>
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		<p>Things Intended To Form Or Forming Part Of The Works.</p> <p>(m) ‘Temporary Works’ Shall Mean All Temporary Tasks Of Every Kind Required In Or About Execution, Completion Or Maintenance Of The Work.</p> <p>(n) ‘Drawing’ Shall Mean The Drawings Referred To In The Specification And Any Modification Of Such Drawings Approved In Writing By The Engineer And Such Drawings As May From Time To Time Be Furnished Or Approved In Writing By The Engineer.</p> <p>(o) ‘Approved’ Shall Mean Approved In Writing Including Subsequent Confirmation Of Previous Verbal Approval And “Approval” Shall Mean Approval In Writing Including As Aforesaid.</p> <p>(p) ‘Specification’ Means The Specification Referred To In The Tender And Any Modification Thereof Or Addition Or Deduction Thereto As May From Time To Time Be Furnished Or Approved In Writing By The Engineer.</p> <p>(q) “Tender” Means The Contractor’s Priced Offer To The Corporation For The Execution And Completion Of The Works And The Remedying Of Any Defects Therein In Accordance With The Provision Of The Contract, As Accepted By The Letter Of Acceptance.</p> <p>(r) ‘Letter Of Acceptance’ Means The Formal Acceptance By The Corporation.</p> <p>(s) ‘Commencement Date’ Means The Date Upon Which The Contractor Receives The Notice To Commence The Work Issued By The Engineer Pursuant To Clause 80.</p> <p>(t) ‘Time For Completion’ Means The Time For Completing The Execution Of And Passing The Tests On Completion Of The Works Or Any Section Or Part Thereof As Stated In The Contract (Or As Extended Under Clause 83 Calculated From The Commencement Date.</p> <p>(u) The ‘Annexure’ Referred To In These Conditions Shall Means The Relevant Annexure Appended To The Tender Papers Issued By The Corporation.</p>
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PART – II

INSTRUCTIONS TO CONTRACTOR


4.	Scope Of Work	The Work To Be Carried Out Under The Contract Shall, Except As Otherwise Provided In These Conditions, Include All Labour, Materials, Tools, Plant, Equipment And Transport Which May Be Required In Preparation Of And For And In The Full And Entire Execution And Completion Of The Works. The Descriptions Given In The Schedule Of Works /Items / Quantities, And The Bills Of Quantities Shall, Unless Otherwise Stated, Be Held To Include Waste On Materials, Carriage And Cartage, Carrying In, Return Of Empties, Hoisting, Setting, Fitting And Fixing In Position And All Other Labour Necessary In And For The Full And Entire Execution And Completion As Aforesaid In Accordance With Good Practice And Recognized Principles.
5.	Corrupt Or Fraudulent Practices	<p>The Corporation Requires That The Bidders/Suppliers/ Contractors Under This Tender Observe The Highest Standards Of Ethics During The Procurement And Execution Of Such Contracts. In Pursuance Of This Policy, The Corporation Defines For The Purposes Of This Provision, The Terms Set Forth As Follows:</p> <p>A)“Corrupt Practice” Means The Offering, Giving, Receiving Or Soliciting Of Any Thing Of Value To Influence The Action Of The Public Official In The Procurement Process Or In Contract Execution; And</p> <p>B)“Fraudulent Practice” Means A Misrepresentation Of Facts In Order To Influence A Procurement Process Or A Execution Of A Contract To The Detriment Of The Corporation, And Includes Collusive Practice Among Bidders (Prior To Or After Bid Submission) Designed To Establish Bid Prices At Artificial Non-Competitive Levels And To Deprive The Corporation Of The Benefits Of The Free And Open Competition;</p> <p>The Corporation Will Reject A Proposal For Award If It Determines That The Bidder Recommended For Award Has Engaged In Corrupt Or Fraudulent Practices In Competing For The Contract In Question; The Corporation Will A Firm Ineligible, Either Indefinitely Or For A Stated Period Of Time, To Be Awarded A Contract If It At Any Time Determines That The Firm Has Engaged In Corrupt And Fraudulent Practices In Competing For, Or In Executing, A Contract.</p>

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6.	Intimation To Successful Tenderers	The Acceptance Of Tender May Be Communicated To The Successful Tenderer In Writing Or Otherwise Either By The Tender Opening Authority Or Any Authority In The Corporation.
7.	Security Deposit	<p>The Contractor Shall Pay A Security Deposit Equal To Five Percent Of The Contract Sum As Security For Due Fulfillment Of The Contract, Unless Otherwise Stated In The Tender Documents.</p> <p>The Mode Of Making This Deposit Is As Under.</p> <p>Initial Or Contract Deposit</p> <p>A Sum, Which Along With The Earnest Money Already Paid, Amounts To Three Percent Of The Contract Sum Shall Be Paid Within 15 Days After Receipt Of Intimation In Writing Of Acceptance Of Tender. It Is Optional To The Contractor To Make The Contract Deposit In One Of The Other Of The Following Ways :</p> <ul style="list-style-type: none"> i) Wholly In Cash Or. ii) Wholly In Form Of National Saving Certificate Pledged In Favour Of The Corporation Or Bank Guarantees / Fixed Deposit From Nationalised/ Scheduled Banks In The Enclosed Format. iii) Partly In Cash And Partly In Form Of National Saving Certificate Pledged In Favour Of The Corporation Or Bank Guarantees / Fixed Deposit From Nationalised/ Scheduled Banks In The Enclosed Format <p>Retention Money:</p> <p>The Remaining Amount Of The Security Deposit I.E. 2% Shall Be Recovered From The Contractor's Running Bills At The Rate Of Five Percent And Such Retention Together With The Contract Deposit Made As Aforesaid Shall Not Exceed In The Aggregate Five Percent Of The Contract Sum After Which Such Retention Will Cease.</p>
8.	Forfeiture Of Security Deposit	All Compensation Or Other Sums Of Money Payable By The Contractor Under The Terms Of This Contract Or Any Other Account Whatsoever, May Be Deducted From Or Paid By The Sale Of A Sufficient Part Of This Security Deposit/Retention Money Or From The Interest Arising There From Or From Any Sums Which May Be Due Or May Become Due To The Contractor By The Corporation On Any Account Whatsoever, And In The Event Of His Security Deposit/Retention Money Being Reduced By Reason Of Any Such Deduction Or Sale As

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		<p>Aforesaid, The Contractor Shall Within 15 Days Of Receipt Of Notice Of Demand From The Engineer Make Good The Deficit.</p> <p>On the Event Of The Said Deposit Having Been Made By Contractor By Delivery To The Corporation Of Guarantee Of The Bankers Of The Contractor, And Of Contractor Under Any Of The Provisions Of This Contract Becoming Subject To Or Liable For Any Penalty Damages Liquidated Or Unliquidated Or Of The Said Deposit Becoming Forfeited Any Breach Or Failure Determination Of Contract, Then, And In Such Case Amount Of Any Such Penalty Or Damages And The Deposit So Forfeited Is Not Previously Paid To The Municipal Commissioner, Shall Immediately On Demand Be Paid To The Said Bankers To And May Be Forfeited By Municipal Commissioner Under And In Terms Of The Said Guarantee.</p>
9.	Execution Of Contract Document	The Successful Tenderer After Furnishing Initial Security Deposit, Is Required To Execute An Agreement In Duplicate In The Form Attached With The Tender Documents On A Stamp Paper Of Proper Value. The Proper Value At Present Is Rs. 100/-. The Agreement Should Be Signed Within One Month From The Date Of Acceptance Of The Tender
10.	Issue Of Work Order	Work Order Will Be Issued After Execution Of Contract Document.
11.	Contract Documents	The Contractor Shall Be Furnished, Free Of Charge, Two Certified True Copies Of The Contract Documents And All Further Drawings Which May Be Issued During The Progress Of The Work. None Of These Documents Shall Be Used By The Contractor For Any Purpose Other Than That Of This Contract.
12.	Indemnity Bond	The Contractor Shall Require To Execute An Indemnity Bond For Satisfactory Performance Of The Entire Project On Stamp Paper Of Rs.100/- In The Format As Per Annexure 'D'. This Indemnity Bond Shall Remain In Force For Period Mentioned In Schedule 'A' As Defect Liability Period After Completion Of The Project.
13.	Licences	The Successful Tenderer Should Comply Statutory Instruction Of Contract Labour & Will Be Required To Produce To The Satisfaction Of The Engineer A Valid Contract Labour Licence Issued In His Favour Under The Provision Of The Contract Labour (Regulation And Abolition) 1970, Before Starting The Work. On

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		Failure To Do So, The Acceptance Of The Tender Is Liable To Be Withdrawn And Also The Earnest Money Is Liable To Be Forfeited.
14.	Details To Be Confidential	The Contractor Shall Treat The Details Of The Contract As Private And Confidential, Save In So Far As May Be Necessary For The Purposes Thereof, And Shall Not Publish Or Disclose The Same Or Any Particulars Thereof In Any Trade Or Technical Paper Or Elsewhere Without The Previous Consent In Writing Of The Engineer. If Any Dispute Arises As To The Necessity Of Any Publication Or Disclosure For The Purpose Of The Contract The Same Shall Be Referred To The Corporation Whose Determination Shall Be Final.
15.	Official Secrecy	The Contractor Shall, Whenever Required, Take Necessary Steps To Ensure That All Persons Employed On Any Work In Connection With This Contract Have Noticed That The India Official Secrets Act 1923 (XIX Of 1923) Applies To Them And Shall Continue To Apply Even After Execution Of Such Work Under The Contract.
16.	Assignment	The Contractor Shall Not Assign Transfer Or Attempt To Assign, Transfer The Contract Or Any Part Thereof, Or Any Benefit Or Interest Therein Or There Under Otherwise Than By A Charge In Favour Of The Contractor's Bankers Of Any Money Due Or To Become Due Under This Contract, Without The Prior Written Approval Of The Commissioner.
17.	Sub-Letting	<p>The Contractor Shall Not Sub-Let Or Attempt To Sub-Let The Whole Of The Works. Except Where Otherwise Provided By The Contract, The Contractor Shall Not Sub-Let Any Part Of The Works Without The Prior Written Approval Of The Engineer, Which Shall Not Be Unreasonably With-Held, And Such Approval, If Given, Shall Not Relieve The Contractor From Any Liability Or Obligation Under Defaults And Neglects Of Any Sub-Contractor, His Agents, Servants Or Workmen As Fully As If They Were The Acts, Defaults Or Neglects Of The Contractor, His Agents, Servants Or Workmen. Provided Always That The Engagement Of Labour On A Piecework Basis Or Labour With Material Not To Be Incorporated In The Work Shall Not Be Deemed To Be A Sub-Letting Under This Clause.</p> <p>The Contractor Shall Be Responsible For Observance By His Sub-Contractors Of The Foregoing Provisions</p>
18.	Changes In Constitution	Where The Contractor Is A Partnership Firm, The Prior Approval In Writing Of The Commissioner Shall Be Obtained Before Any Change Is Made In The Constitution Of The Firm. Where The Contractor Is An

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		Individual Or Hindu Undivided Family Business Concern Such Approval As Aforesaid Shall Likewise Be Obtained Before The Contractor Enters Into Any Partnership Agreement Where Under The Partnership Firm Would Have The Right To Carry Out The Work Hereby Undertaken By The Contractor. If Prior Approval As Aforesaid Is Not Obtained The Contract Shall Be Deemed To Have Been Assigned In Contravention Of The Clause No. 108 Hereof And The Same Action May Be Taken And The Same Consequences Shall Ensure As Provided For In The Said Condition.
19.	Power Of Attorney	The Contractor Shall Not Issue Any Kind Of Power Of Attorney In Favour Of His Bankers For Routine Payments To The Contractors Through Bank.
20.	Contractors Staff	The Contractor Shall Employ In And About The Execution Of Works Only Such Persons As Are Skilled And Are Experienced In Their Several Trades And The Engineer Shall Be At Liberty To Object To And Require The Contractor To Remove From The Works Any Person, Employed By The Contractor In Or About The Execution Of The Works, Who In The Opinion Of The Engineer Misconducts Himself Or Is Incompetent Or Negligent In The Proper Performance Of His Duties And Such Person Shall Not Be Again Employed Upon The Works Without Permission Of The Engineer.
21.	Contractors' Supervision	<p>The Contractor Shall Himself Supervise The Execution Of Works Or Shall Appoint Competent Agent Approved By The Engineer To Act In His Stead. If, In The Opinion Of The Engineer The Contractor Himself Not Have Sufficient Knowledge And Experience To Be Capable Of Receiving Instructions Or Cannot Give His Full Attention To The Works, The Contractor Shall At His Own Expense, Employ As His Accredited Agent An Engineer Or A Suitably Qualified And Experienced Person Approved By The Engineer. The Name Of The Agent So Appointed, Along-With The Qualifications, Experience And Address Shall Be Communicated To The Engineer. The Agent Shall Be A Responsible Person Adequately Organisation By The Contractor To Take Decision On Site And To Spend Money If Required For Procuring Material And Labour Etc. To Carry Out Emergency Works In The Interest Of The Work, If So Required By The Engineer. Orders Given To Contractor's Agent Shall Be Considered To Have The Same Force As If These Had Been Given To The Contractor Himself.</p> <p>If The Contractor Fails To Appoint A Suitable Agent As Directed By The Engineer, The Engineer Shall Have Full Powers To Suspend The Execution Of The Works Until Such Date As A Suitable Agent Is Appointed And The Contractor</p>

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		Shall Be Held Responsible For The Delay So Caused To The Works.
22.	Employment Of Labour	<p>The Contractor Shall Employ The Labour In Sufficient Numbers To Maintain The Required Rate Of Progress And Of Quality To Ensure Workmanship, Of The Degree Specified In The Contract And To The Satisfaction Of The Engineer. The Contractor Shall Not Employ In Connection With The Work Any Child Who Has Not Completed His 15th Year Of Age. He Shall Also Not Employ An Adolescent Who Has Not Completed His 18th Year Unless He Is Certified Fit For Work As An Adult As Prescribed Under Clause (B) Of Sub-Section (2) Of Section 69 Of The Factories Act, 1948.</p> <p>The Contractor Shall Make His Own Arrangement For The Engagement Of All Labour Local Or Otherwise.</p> <p>The Contractor Shall Indemnify The Corporation Or Any Agent, Servant Or Employee Of Corporation For Any Lapses On The Part Of Contractor On Account Of Non-Compliance Of Above Referred Acts.</p>
23.	Compliance With Labour Regulation.	<p>The Contractor Shall Pay Fair And Reasonable Wages To The Workmen Employed By Him, For The Contract Undertaken By Him. In The Event Of Any Dispute Arising Between The Contractor And His Workmen On The Grounds That The Wages Paid Are Not Fair And Reasonable, The Dispute Shall Be Referred Without Delay To The Engineer, Who Shall Decide The Same. The Decision Of The Engineer Shall Be Conclusive And Binding On The Contractor But Such Decision Shall Not In Any Way Affect The Conditions In The Contract Regarding The Payment To Be Made By Corporation At The Same Sanctioned Tender Rates.</p> <p>The Employees Of The Contractor And The Sub-Contractor In No Case Shall Be Treated As The Employees Of The Corporation At Any Point Of Time.</p> <p><u>SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.</u></p> <p>(i) <u>Workman Compensation Act 1923.</u></p> <p>The Act Provides For Compensation In Case Of Injury By Accident Arising Out Of And During The Course Of Employment.</p> <p>(ii) <u>Payment Of Gratuity Act 1972.</u></p> <p>Gratuity Is Payable To An Employee Under The Act On Satisfaction Of Certain Conditions On Separation If An Employee Has Completed 5 Years Service Or More Or On Death At The Rate Of 15 Days Wages For Every Completed Year Of Service. The Act Is Applicable To All</p>

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	<p>Establishments Employing 10 Or More Employees.</p> <p><u>(Iii) Employees PF And Miscellaneous Provision Act, 1952.</u></p> <p>The Act Provides For Monthly Contributions By The Employer Plus Workers @ 10% Or 8.33% .The Benefits Payable Under The Act Are</p> <ul style="list-style-type: none"> (a) Pension Or Family Pension On Retirement Or Death As The Case May Be. (b) Deposit Linked Insurance On The Death In Harness Of The Worker. (c) Payment OfPF Accumulation On Retirement/ Death Etc. <p><u>(iv) Maternity Benefit Act 1951</u></p> <p>Act Provides For Leave And Some Other Benefits To Women Employees In Case Of Confinement Or Miscarriage Etc.</p> <p><u>(v) Contract Labour (Regulation AndAbolition) Act 1970.</u></p> <p>The Act Provides For Certain Welfare Measures To Be Provided By The Contractor To Contract Labour And In Case The Contractor Fails To Provide, The Same Are Required To Be Provided By The Principal Employer By Law. The Principal Employer Is Required To Take Certificate Of Registration And The Contractor Is Required To Take A LicenceFrom The Designated Officer. The Act Is Applicable To The Establishments Or Contractor Of Principle Employer If They Employ 20 Or More Contract Labour.</p> <p><u>(vi) Minimum Wages Act 1970</u></p> <p>The Contractor Shall See That The Provisions Set For Under The Minimum Wages Act And Contract Regulation And Abolition Act 1970 With The Maharashtra Contract Labour(Regulation And Abolition) Rules 1971 As Amended From Time To Time Are Fully Complied With By Him And Shall Maintain Necessary Registers And Records For Payment Of Wages, Overtime, Etc. Made To His Workmen As Required By The Conciliation Officer (Central), Ministry Of Labour, Government Of India, Or Such Other Organisation Person Appointed By The Central Or State Government.</p> <p><u>(vii) Payment Of Wages Act 1936</u></p> <p>It Lays Down As To By What Date The Wages Are To Be Paid, When It Will Be Paid And What Deductions Can Be Made From The Wages Of The Workers.</p>
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		<p>(viii) <u>Equal Remuneration Act 1979.</u></p> <p>The Act Provides For Payment Of Equal Wages For Work Of Equal Nature To Male &Female Workers And Not For Making Discrimination Against Female Employees In The Matters Of Transfers, Training And Promotions Etc.</p> <p>(ix) <u>Payment Of Bonus Act 1965</u></p> <p>The Act Is Applicable To All Establishments Employing 20 Or More Workmen. The Act Provides For Payments Of Annual Bonus Subject To A Minimum Of 8.33% Of Wages And Maximum Of 200% Of Wages To Employees Drawing Rs. 3,500/- P.M. Or Less. The Bonus To Be Paid To Or Employees Getting Rs. 2500/- P.M. Above Upto 3500/- P.M. Shall Be Worked Out By Taking Wages As Rs. 2500/- P.M. Only. The Act Does Not Apply To Certain Establishments. The Newly Set Up Establishments Are Exempted For Five Years In Certain Circumstances. Some Of The State Governments Have Reduced The Employment Size From 20 To 10 For The Purpose Of Applicability Of The Act.</p> <p>(x) <u>Industrial Disputes Act 1947</u></p> <p>The Act Lays Down The Machinery And Procedure For Resolution Of Industrial Disputes, In What Situations A Strike Or Lock-Out Becomes Illegal And What Are The Requirements For Laying Off Or Retrenching The Employees Or Closing Down The Establishment.</p> <p>(xi) <u>Industrial Employment (Standing Orders) Act 1946</u></p> <p>It Is Applicable To All Establishments Employing 1000 Or More Workmen (Employment Size Reduced By Some Of The States And Central Government To 50). The Act Provides For Laying Down Rules Governing The Conditions Of Employment By The Employer Or Matters Provided In The Act And Get The Same Certified By The Designated Authority.</p> <p>(xii) <u>Trade Unions Act 1926</u></p> <p>The Act Lays Down The Procedure For Registration Of Trade Unions Of Workmen And Employers. The Trade Unions Registered Under The Act Have Been Given Certain Immunities From Civil And Criminal Liabilities.</p> <p>(xiii) <u>Child Labour (Prohibition And Regulation)Act 1986.</u></p>
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		<p>The Act Prohibits Employment Of Children Below 14 Years Of Age In Certain Occupation And Processes And Provides For Regulation Of Employment Of Children In All Other Occupations And Processes. Employment Of Child Labour Is Prohibited In Building And Construction Industry.</p> <p><u>(xiv) Inter-State Migrant Workmen's (Regulation Of Employment And Conditions Of Service) Act 1979.</u> The Act Is Applicable To An Establishment Which Employees 5 Or More Inter-State Migrant Workmen Through An Intermediary (Who Has Recruited Workmen In One State For Employment In The Establishment Situated In Another State). The Inter-State Migrant Workmen, In An Establishment To Which This Act Becomes Applicable, Are Required To Be Provided Certain Facilities Such As Housing, Medical Aid, Traveling Expenses From Home Upto The Establishment And Back, Etc.</p> <p><u>(xv) The Building & Other Construction Workers (Regulation Of Employment And Conditions Of Service) Act 1996 And The Cess Act Of 1996.</u> All The Establishments Who Carry On Any Building Or Other Construction Work And Employs 10 Or More Workers Are Covered Under This Act. All Such Establishments Are Required To Pay Cess At Rate Not Exceeding 2% Of The Cost Of Construction As May Be Notified By The Government. The Employer Of The Establishment Is Required To Provide Safety Measures At The Building Or Construction Work And Other Welfare Measures, Such As Canteens, First-Aid Facilities, Ambulance, Housing Accommodation For Workers Near The Workplace Etc. The Employer To Whom The Act Applies Has To Obtain A Registration Certificate From The Registering Officer Appointed By The Government.</p>
24.	Safety Provisions	The Contractor Shall At His Own Expense Arrange For The Safety Provisions Indicated In Annexure 'A' Or As Required By The Engineer, In Respect Of All Labour Directly Or Indirectly Employed For Performance Of The Works And Shall Provide All Facilities In Connection Therewith. In Case The Contractor Fails To Make Arrangements And Provide Necessary Facilities As Aforesaid, The Engineer Shall Be Entitled To Do So And Recover The Costs Thereof From The Contractor.
25.	Provision Of First-Aid Box	The Contractor Shall, At His Own Cost, Provide And Maintain At The Site Of Works A Standard First Aid Box As Directed And Approved By The Engineer For The Use Of His Own As Well As The Corporation'S Staff On Site.

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26.	Apprentices	The Contractor Shall Comply With The Provision Of The Apprentices 1961, And The Rules And Orders Issued There Under From Time To Time. The Contractor Shall During The Term Of This Agreement Maintain A Part Of His Organisation A System Of Apprenticeship For Training Craftsmen As May Be Approved By The Engineer. The Apprentices To Be Engaged And Trained In The Building Craft/Trades. The Number Of Apprentices To Be Engaged Shall Be Decided And Got Approved By The Office Of The Director Of Technical Education And Skill Development, Apprenticeship Advisor, Maharashtra State, Dhobi Talao, Bombay - 400001. Failure On The Part Of The Contractor To Observe The Stipulations Of This Conditions Shall Be Deemed To Be Failure To Employ A Sufficient Number Of Proper And Efficient Workmen And All The Rights And Remedies Of The Commissioner Therein Provided Including The Power To Determine The Contract Shall Be Applicable In Such Case. The Contractor Shall Also Be Liable For Any Pecuniary Liability Arising On Account Of Any Violation By Him Of The Provisions Of The Act.
27.	Personnel.	The Contractor Shall Employ The Key Personnel Named In The Schedule Of Key Personnel (Annexure 'B') Or Other Personnel Approved By The Engineer To Carry Out The Functions. The Engineer Will Approve Any Proposed Replacement Of Key Personnel Only If Their Qualifications, Abilities And Relevant Experience Are Substantially Equal To Or Better Than Those Of The Personnel Listed In The Schedule.
28.	Temporary Site Office For The Engineer (For Works Costing Above Rs. 50 Lacks Only)	The Contractor Shall At His Own Cost And To The Satisfaction Of The Engineer, Provide A Site Office Of Not Less Than 25 Sq. Mtr. With Brick Walls, Plastering Inside, Rough Shahabad Flooring And One Writing Table With Six Chairs And Large Size Steel Cupboard. He Shall Also Make Necessary Arrangements For Drinking Water And Electric Connection And Locking Arrangement. Upon Completion Of The Whole Work And After Clearing The Site And Upon Expiry Of Defect Liability Period, The Contractor Shall Remove The Site Office And Take Possession Of The Furniture And Cupboards Provided By Him In The Condition It Was On The Date Of Receiving Back The Same.
29.	Contractor's Office Near Works	The Contractor Shall Have An Office Near The Works At Which Notice From The Engineer May Be Served And Shall, Between The Hours Of Sunrise And Sunset On All Working Days, Have A Clerk Or Some Other Organisation Person Always Present At Such Office Upon Whom Such Notices May Be Served And Service Of Any Notices Left With Such Clerk Or Other Organisation Person Or At Such Office Shall Be Deemed Good Service Upon The Contractor.
30.	Permission For Erection	The Contractor Shall Obtain Permission For Erection Of Site Office, Cement Godown, Store, Etc. On Payment Of

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	& Removal Of Office On Completion Of Work	Necessary Charges As Demanded By The Concerned Authorities As Per The Prevailing Rules. The Cement Godown, Watchman Cabins, Etc. Shall Be Provided As Directed And Shall Be Removed By The Contractor On Completion Of The Work At Their Cost.
31.	Use Of Municipal Land	<p>(A) The Contractor Shall Not Be Permitted To Enter On (Other Than For Inspection Purposes) Or Take Possession Of Site Until Instructed To Do So By The Engineer In Writing.</p> <p>The Portion Of The Site To Be Occupied By The Contractor Shall Be Defined And/Or Marked On The Site Plan, Failing Which These Shall Be Indicated By The Engineer. The Contractor Shall On No Account Be Allowed To Extend His Operations Beyond These Areas. The Use Of Such Portion Of The Site Shall Be Allowed Free Of Any Lease Rent During Scheduled Time Period For The Completion Of The Work. However At The Expiry Of The Stipulated Period Of The Work, As May Be Extended From Time To Time, Contractor Has To Pay Charges For These Facilities As Per The Prevailing Rates Levied By The Corporation For Use Of Public Utility Places.</p> <p>The Contractor Will Be Allowed To Use The Land For The Purpose Of Sheds, Offices Thereon For Themselves And For The Engineer And His Subordinates And Shall Remove The Same From The Ground On The Completion Of The Works, Or When Required To Do So, By The Engineer After Receiving 7 Days Notice. He Shall Make Good Any Damage Which May Have Been Done And Restore To Good Condition Any Thing Which May Have Been Disturbed During The Period Of His Occupation.</p> <p>He Shall Not Use Or Allow To Be Used Any Such Ground, Sheds Or Offices, Or Any Portion Of The Site Of The Works, For Any Other Purpose Than The Carrying Out Of Works Under This Contract, Failing Which Charges Applicable Will Become Payable In The Event Of There Being On Plot Or Ground Or Insufficiency Of Ground Belonging To The Corporation Available For The Above Purpose, The Contractor Shall Provide Other Such Ground At His Own Cost.</p> <p>The Contractor Shall In Any Case Pay All Taxes Which May Have To Be Paid In Respect Of All Ground, Sheds Or Offices Used As Above, And All The License Fees, Etc., That May Be Demanded For The Storage Or Otherwise Of The Various Articles As Per Rules In Force.</p> <p>The Contractor Shall Provide, If Necessary Or If Required On The Site All Temporary Accesses Thereto And Shall Alter, Adopt And Maintain The Same As Required From Time To Time And Shall Take Up And Clear Them Away As And When No Longer Required And Make Good All Damage Done To The Site.</p> <p>The Contractor Has Also Be Allowed At The Sole Discretion Of The Corporation To Stack Material Required For Execution Of Work In Corporation Land Out Of The Project Area On Payment Of Necessary Charges As Per Corporation Rules For Use Of Roads Public Utility Places.</p>
32.	Water Supply For Corporation Work	The Water Will Not Be Supplied By The Corporation. The Contractor Has To Make His Own Arrangements For Supply Of Water. However On Availability Of Water It Can Be Supplied At The Organisation Corporation Rate And Terms

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		And Conditions.
33.	Electric Supply	No Power Connection Shall Be Provided. The Contractor Shall Make At His Own Cost His Own Arrangement For Power Connection, If Required.
34.	Contractor To Protect The Work	The Contractor Shall Make His Own Arrangements For Protecting The Work / Protection Ageist Obstructions From Any Anti-Social Elements By Taking At His / Their Cost Police Protection Or Such Other Legal Methods Through Law Enforcing Authorities And That The Corporation Shall Not Be Liable To Compensate The Contractor On This Account. The Corporation Would Only Forward The Application Of The Contractor To The Police Deptt. Without Any Liability Against The Corporation On This Account.
35.	Fencing, Watching And Lighting	The Contractor Shall Provide And Maintain At His Own Expense All Lights, Guards, Fencing And Watching When And Where Necessary Or As Required By The Engineer For The Protection Of The Safety And Convenience Of Those Employed On The Works Or The Public. In The Event Of Failure On The Part Of The Contractor, The Engineer May With Or Without Notice To The Contractor Put Up A Fence Or Improve A Fence Already Put Up Or Provide And/Or Improve The Lighting Or Adopt Such Other Measures As He May Deem Necessary, And All The Cost Of Such Procedures As May Be Adopted By The Engineer Shall Be Borne By The Contractor. In Addition The Engineer May Impose Such Fines Or Penalty As The Engineer May Deem Reasonable, Under Clause No. 53.
36.	Contractor's Liabilities & Insurance (Car Policy)	<p>From Commencement To Completion Of The Works, The Contractor Shall Take Full Responsibility For The Care Thereof And For Taking Precautions To Prevent Loss Or Damage And To Minimize The Loss Or Damage To The Greatest Extent Possible And Shall Be Liable For Any Damage Or Loss That May Happen To The Works Or Any Part Thereof.</p> <p>The Policy So Obtained Shall Cover Entire Period Of Construction (Including All Extensions) And Also Shall Cover The Defects Liability Period. The Policy Shall Be For The Total Contract Sum.</p> <p>Before Commencing Execution Of The Work, The Contractors Shall Without In Any Way Limiting His Obligations And Responsibilities Under This Condition, Insure Against Any Damage Loss Or Injury Which May Occur To Any Property (Private, Government And/Or Corporation) Or To Any Person (Including Any Employee Of The Corporation) By Or Arising Out Of The Contract.</p> <p>All Insurances (Car Policy) To Be Affected By The</p>

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		<p>Contractors And/Or His Sub-Contractors Shall Be Taken Out With Directorate Of Insurance, Maharashtra State Only. In Case, However, A Particular Aspect Is Not Covered Under The Policy To Be Obtained From The Directorate Of Insurance, Maharashtra State, The Contractor Will Be Allowed To Have Such Insurance From Other Insurance Company With The Prior Permission Of The Commissioner.</p> <p>If The Contractor Has A Blanket Insurance Policy For All His Works And The Policy Covers All The Items To Be Insured Under This Condition, The Said Policy Shall Be Assigned By The Contractor, In Favour Of The Corporation; Provided, However, If Any Amount Is Payable Under The Policy By The Insurers In Respect Of Works Other Than The Works Under This Contract, The Same May Be Recovered By The Contractor Directly From The Insurers. The Amount Of Claim To The Extent Payment Made By Corporation Shall Be Directly Reimbursed To Corporation By Insurer.</p> <p>PROVIDED Always That The Contractor Shall Not Be Entitled To Payment Under The Above Provisions In Respect Of Such Loss Or Damage As Have Been Occasioned By Any Failure On His Part To Perform His Obligations Under The Contract Or Not Taking Precautions To Prevent Loss Or Damage Or Minimize The Amount Of Such Loss Or Damage.</p> <p>Where A Corporation`SBuildingOr Part Thereof Is Rented By The Contractor Or Is Allowed To Be Used By Him, He Shall Insure The Entire Building If The Building Or Any Part Thereof Is Used By Him For The Purpose Of Storing Or Using Materials Of Combustible Nature As To Which The Decision Of The Engineer Shall Be Final And Binding.</p> <p>The Contractor Shall Indemnify And Keep Indemnified The Corporation Against All Losses And Claims For Injuries Or Damage To Any Person Or Any Property Whatsoever Which May Arise Out Of Or In Consequence Of The Construction And Maintenance Of The Work And Against All Claims, Demands, Proceedings, Damages, Costs, Charges And Expenses Whatsoever In Respect Of Or In Relation Thereto.</p> <p>PROVIDED Always That Nothing Herein Contained Shall Be Deemed To Render The Contractor Liable For Or In Respect Of Or To The Corporation Against Any Compensation Or Damage Caused By The Excepted Risks.</p> <p>The Contractor Shall At All Times Indemnify The Corporation Against All Claims, Damages Or Compensation Under The Provisions Of Payment Of Wages Act 1936, Minimum Wages Act 1948, Employers Liability Act 1938, The Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Indian Factories Act 1948 And Maternity Benefit Act, 1961 Or Any Modifications Thereof And Rules Made There Under From Time To Time Or As A Consequence Or</p>
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		<p>Any Accident Or Injury To Any Workman Or Other Persons In Or About The Works, Whether In The Employment Of The Contractor Or Not, Save And Except Where Such Accident Or Injury Have Resulted From Any Act Of The Corporation, Their Agents Or Servants, And Also Against All Cost, Charges And Expenses Of Any Suit, Action Or Proceedings Arising Out Of Such Accident Or Injury And Against All Sum Or Sums Which May With The Consent Of The Contractor Be Paid To Compromise Or Compound Any Such Claim Without Limiting His Obligations And Liabilities As Above Provided. The Contractor Shall Insure Against All Claims Damages Or Compensation Payable Under The Various Acts Mentioned Above Or Any Modifications Thereof Or Any Other Law Relating Thereto.</p> <p>The Aforesaid Insurance Policies Shall Provide That They Shall Not Be Canceled Till The Commissioner Has Agreed To Their Cancellations.</p> <p>The Contractor Shall Prove To The Engineer From Time To Time That He Has Taken Out All The Insurance Policies Referred To Above And Has Paid The Necessary Premia For Keeping The Policies Alive Till The Expiry Of The Defects Liability Period After Completion Of Work For A Period Of Not Exceeding 12 Months As Per Directives Of Directorate Of Insurance, Maharashtra State.</p> <p>The Contractor Shall Ensure That Similar Insurance Policies Are Taken Out By His Sub Contractors(If Any) And Shall Be Responsible For Any Claims Or Losses To The Corporation Resulting From Their Failure To Obtain Adequate Insurance Protection In Connection Thereof. The Contractor Shall Produce Or Cause To Be Produced By His Sub-Contractor (If Any) As The Case May Be, The Relevant Policy Or Policies And Premium Receipts As And When Required By The Engineer.</p> <p>If The Contractor And/Or His Sub-Contractors (If Any) Shall Fail To Effect And Keep In Force The Insurance Referred Above For Any Other Insurance Which He/They May Require To Effect Under The Terms Of Contract Then And In Any Such Case The Commissioner May Without Being Bound To Effect And Keep In Force Any Such Insurance And Pay Premium Or Premia As May Be Necessary For That Purpose And From Time To Time Deduct The Amount So Paid By The Corporation Plus 20 Per Cent Of Premium Or Premia Amount As Service Charges From Any Money Due Or Which May Become Due To The Contractor Or Recover The Same As Debt From The Contractor.</p>
37.	Contractor To Preserve Peace	The Contractor Shall At All Times During The Progress Of The Work Take All Requisite Precaution And Use His Best Endeavors For Preventing Any Riotous Or Unlawful

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		Behavior By Or Amongst The Workers And Other Employed On The Works And For The Preservation Of Peace And Protection Of The Inhabitants And Security Of Property In The Neighborhood Of The Works. He Shall Also Pay The Charges Of Such Special Police (If Any) As The Engineer May Deem Necessary.
38.	Protection Of Trees	Trees Designated By The Engineer Shall Be Protected From Damage During The Course Of The Work And Earth Level Within One Metre Of Each Such Tree Shall Not Be Changed. Where Necessary, Such Trees Shall Be Protected By Temporary Fencing. All Such Cost Shall Be Borne By The Contractor.
39.	Maintenance Of Under- Ground Utility Services	<p>All The Underground Utility Services Such As Water Pipes, Gas Pipes, Drains, Sewers, Cables Etc., Which May Be Met Up In Or About Any Excavation, Shall If The Engineer Deem It Practicable, Be Properly Maintained And Protected By The Contractor Himself Or Through Other Agency By Means Of Shoring, Strutting, Planking Over, Padding Or Otherwise As Directed By The Engineer During The Progress Of The Work Without Claiming Any Extra Charges. Any Damage To These Underground Utility Services Shall Be Immediately Remedied By The Contractor Or By Other Agency At His Own Cost, Failing Which The Engineer May With Or Without Notice Adopt Such Measures As He May Deem Necessary At The Risk And Cost Of The Contractor.</p> <p>If On The Other Hand, The Engineer Considers It Impracticable For The Contractor To Maintain Any Such Underground Utility Services And That The Exigencies Of The Work Necessitate, The Breaking Down, Removal Or Diversion Of The Said Utility Services, The Cost Of Such Breaking Down, Removal Or Diversion Including That Of Rebuilding, Replacing, Diverting And Reinstating Of Any Such Utility Services Shall Be Paid To The Contractor If Done By Him. However, The Cost Of Providing Pumps, Chutes Or Other Appliances As The Engineer May Direct For The Raising Or Temporary Passage Of The Water Or Sewage And The Cost Of Pumping Out Or Removing As Often As The Engineer May Direct, Any Water Or Sewage Which May Escape From Any Such Underground Utility Services, Shall Be Borne By The Contractor.</p> <p>The Tenderer Shall Contact All The Public Bodies, Etc. To Know The Under-Ground Services That May Be Encountered By Him / Them During The Execution Of The Work And Account For The Consequences Of The Site Restraints While Submitting Their Tenders. No Compensation / Cost Shall Be Payable On Account Of Any Under-Ground Services Which Obstructs The Work And Cause Delay.</p>

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40.	Precautions For Works In Thorough-Fares	While The Execution Of Any Work Is In Progress In Any Street Or Thoroughfare The Contractor At His Own Cost Shall Make Adequate Provision For The Passage Of Traffic, For Securing Safe Access To All Premises Approached From Such Street Or Thoroughfare, And For Any Drainage, Water Supply, Or Means Of Lighting Or Any Other Utility Service Which May Be Interrupted By Reason Of Execution Of The Work. Whenever It May Be Necessary To Stop The Traffic In Any Street Or Thoroughfare Permission Must First Be Obtained From The Engineer And The Contractor Shall Then Put Up Such Barriers And Adopt Such Other Measures Or Take Precautions As May Be Necessary Or As The Engineer May Direct For Regulation Of Traffic. The Work Shall In Such Cases Be Executed Night And Day Or For As Long A Period As Practicable If So Ordered By The Engineer, And With Such Speed & Vigour As He May Require, So That The Traffic May Be Impeded For As Short A Time As Possible. The Contractor Shall Remove The Barriers As Soon As The Necessity For Them Has Ceased. Care Shall Be Taken By The Contractor To Cause The Least Possible Obstruction To Traffic During The Progress Of The Work.
41.	Traffic	The Contractor Shall Have To Make All Necessary Arrangements For Regulating Traffic Day And Night During The Period Of Construction And To The Entire Satisfaction Of The Engineer. This Includes The Construction And Maintenance Of Diversions, If Necessary, At No Extra Cost To The Corporation. The Contractor Shall Provide Necessary Caution Boards, Barricades, Flags And Lights, Watchmen Etc. So As To Comply With The Latest Motor Vehicle Rules And Regulations And For Traffic Safety. The Contractor Shall Be Responsible For All Claims For The Accidents Which May Arise Due To His Negligence Whether In Regulating Traffic Or In Stacking Materials On The Road Or By Any Other Reason.
42.	Pumping Out Water	The Contractor Will Be Required To Provide And Operate At His Own Cost All Pumps, Engines And Machinery Requisite To Keep The Trenches For The Sewer, Drains Or Foundations And All Other Excavations Clear Of Water Whether Subsoil Water, Storm Waste Or Leakage From Tanks, Wells, Drains, Sewers, Water-Mains, Tide Water Etc. So That There May Be No Accumulation Of Such Water And No Setting Out May Be Done, No Masonry May Be Laid,

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		<p>No Concrete Deposited, No Joints Made And No Measurements Taken In Water. The Pumping Shall Be Continued So Long After The Execution Of Any Portion Of The Work As The Engineer May Consider Necessary For The Work To Set. For The Purpose Of Keeping The Excavations As Dry As Possible The Work Would, If Necessary Be Divided Into Sections Or Separate Portions As Per Best Engineering Practices And Temporary Dams Will Have To Be Put Up By The Contractor, Sumps For The Suction Pipes To Work In, Will Have To Be Excavated By The Contractor At Such Distances Apart And To Such Depths As The As Per Best Engineering Practices. When The Work Progresses Other Sumps Must, From Time To Time, Be Excavated By The Contractor, Disused Sumps Being Filled Up By Him With Dry Rubble Carefully Hand Packed To The Satisfaction Of The Engineer. The Contractor Will Not Be Paid Extra For Any Temporary Dams Or Sumps Or Their Removal Or Refilling Nor Will Such Works Be Taken Into Measurement In Any Way, Unless Otherwise Provided.</p> <p>The Contractor Shall Not Allow Any Accumulation Of Water Either From The Discharge Of His Dewatering Pumps Or His Water Connections On Site Of His Work. The Contractor Shall Make Proper Provision For Leading The Pumped Discharge To The Nearest Water Entrance, Storm Water Drain, Manholes, Or Water Course By Means Of A Wooden Or G.I. Channel Or Hose Pipe. Under No Circumstances The Discharge Will Be Allowed To Flow, Along A Paved Surface. If An Accumulation Is Unavoidable, It Shall Be Treated With Insecticides To The Satisfaction Of The Engineer. In Case Of Failure To Do This On The Part Of Contractor Such Accumulation Shall Be Treated By The Corporation At The Risk And Cost Of The Contractor. The Contractors Should Note That Under No Circumstances Any Payment For Pumping Out Water Finding Its Way Into Trenches, Hill Cutting, Excavated Pits, WorksSite Etc. From Whatever Sources Will Be Permissible Unless Otherwise Specifically Mentioned In The Tender.</p>
43.	Storage Of Explosives	The Contractor Shall Obtain The Previous Permission Of The Competent Authority Such As The Chief Of Fire Services For The Site, Manner And Method Of Storing Explosives Near The Site Of Work. All Handling Of Explosives, Including Storage, Transport Shall Be Carried Out Under The Rules Approved By The “Explosives Department Of The Government”.

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44.	Facilities To The Other Contractors	The Contractor Shall, In Accordance With The Requirements Of The Engineer, Afford All Reasonable Facilities To Other Contractors Engaged Contemporaneously On Separate Contracts In Connection With The Works And For Departmental Labour And Labour Of Any Other Properly Organisation Authority Or Statutory Body Which May Be Employed At The Site On Execution Of Any Work Not Included In The Contract Or Of Any Contract Which The Corporation May Enter Into In Connection With Or Ancillary To The Works.
45.	Prevention Of Mosquito Breeding At Construction Site	(I)The Contractor Shall On The Respective Construction Site Install Mosquito Proof And Accessible Water Storage Tanks Or To Cover / Protect The Present Water Storage Tanks Properly. (Ii) The Contractor Shall Periodically Give Larvaecidal Treatment To Water Storage Tanks, Sites Of Water Stagnation, Water Collection. (Iii) Any Expenditure That May Be Incurred By The Corporation To Ensure That The Above Conditions Are Fulfilled By The Contractor Will Be Debitable To Contractors Account And Will Be Recovered From The Bills Of The Contractor From Time To Time.
46.	Sanitation	The Contractor Shall, At His Own Cost, Make All Necessary Provisions For Health And Safety Of His Labour / Employees. He Shall, When Required By The Engineer, Provide Proper Latrines And Urinals To The Satisfaction Of The Engineer In Such Numbers And In Such Localities As He May Require, And Shall Take All Steps Necessary To Compel His Labour / Employees To Resort To Such Latrines And Urinals, And Shall Dismiss From His Employment And Remove From The Works Any One Detected Obeying The Calls Of Nature In Any Place Other Than The Conveniences Allotted For Such Purposes. The Said Latrines Shall Be Under The Superintendence And Orders Of The Engineer Or His Subordinates.
47.	Not To Allow Huts	The Contractor Shall, On No Account, Allow Any Huts To Be Erected On Corporation Property Unless Otherwise Permitted By The Engineer In Writing, To Be Inhabited After Sunset By Anyone Except The Watchmen Required For The Works, And None Of His Employees, Except Such Watchmen As Aforesaid, Shall Sleep At Night On Any Part Of The Works. In Case Of Any Offence Committed By Any Of The Labour Or Employees Of The Contractor Against Any Of The Provisions Of This Condition The Contractor Shall Be

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		<p>Liabe To A Penalty Not Exceeding Rupees HunderdFor Every Such Offense And The Same Shall Be Charged To The Account Of The Contractor.</p>
48.	Treasure Trove Fossils Etc.	<p>All Fossils, Coins, Articles Of Value Or Antiquity And Structural And Other Remains Things Of Geological Or Archaeological Interest Discovered In Or Upon The Site Shall Be Absolute Property Of The Corporation And The Contractor Shall Duly Preserve Them And Shall Take Precautions To Prevent His Workmen Or Any Other Person From Removing Or Damaging Any Such Articles Or Thing And Shall Immediately Upon Discovery Thereof And Before Removal Acquaint The Engineer With Such Discovery And Shall From Time To Time Deliver The Same To Such Person Or Persons As The Engineer May From Time To Time Appoint To Receive The Same At The Expense Of The Corporation.</p>
49.	Patent' Right And Royalties	<p>The Contractor Shall Save Harmless And Indemnify The Corporation From And Against All Claims And Proceedings For Or On Account Of Infringement Of Any Patent Rights, Design Trademark Or Name Of Other Protected Rights In Respect Of Any Constructional Plant, Machine Work, Or Material Used For Or In Connection With The Works Or Any Of Them And From And Against All Claims, Proceedings, Damages, Costs, Charges And Expenses Whatsoever In Respect Thereof Or In Relation Thereto. Except Where Otherwise Specified, The Contractor Shall Pay All Tonnage And Other Royalties, Rent And Other Payments Or Compensation, If Any, For Getting Stone, Sand, Gravel, Clay Or Other Materials Required For The Works Or Any Of Them.</p>
50.	Quarry	<p>I)QuarryFor Extraction Of Murum, Stone, Rubble Or Any Other Material Shall Not Be Made Available By The Corporation The Contractor Has To Make His Own Arrangements For Quarry At His Cost. ii)The Successful Tenderer Shall Submit Quarry Permit From The Competent Authority Before Starting The Work .</p>
51.	Photographs Of The Works	<p>No Photographs Of The Work Or Any Part There Of Or Equipment Employed Thereon Shall Be Taken Or Permitted By The Contractor To Be Taken By Any Of His Employees Or Any Employees Of His Sub- Contractor Without The Prior Approval Of The Engineer In Writing And No Such Photographs Shall Be Published Or Otherwise Circulated Without The Approval Of The Engineer In Writing.</p>
52.	Notices To	<p>(I)The Contractor Shall Comply With And Give All</p>

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	Local Bodies	<p>Notices Required Under Any Government Authority, Instrument, Rule Or Order Made Under Any Act Of Parliament, State Laws Or Any Regulation Or Bye-Laws Of Any Local Authorities Or Public Utilities Concern Relating To Works. He Shall Before Making Any Variation From The Contract Drawings Necessitated By Such Compliance Give To The Engineer A Notice Giving Reasons For The Proposed Variation And Obtained Engineer's Instructions Thereon.</p> <p>(ii) The Contractor Shall Pay And Indemnify The Corporation Against Any Liability In Respect Of Any Fees Or Charges Payable Under Any Act Of Parliament, State Laws Or Any Governmental Instrument, Rule Or Order Any Regulations Or Bye-Laws Of Any Local Authority Or Public Utility Concern In Respect Of The Works.</p>
53.	Notices	<p>Subject As Otherwise Provided In This Contract All Notice To Be Given On Behalf Of The Corporation And All Other Actions To Be Taken On Its Behalf May Be Given Or Taken By The Engineer Or Any Officer For The Time Being Entrusted With The Functions, Duties And Powers Of The Engineer.</p> <p>All Instructions, Notices And Communications Etc. Under The Contract Shall Be Given In Writing And If Sent By Registered Post To The Last Known Place Or Abode Or Business Of The Contractor Shall Be Deemed To Have Been Served On The Date When In The Ordinary Course Of Post These Would Have Been Served On Or Delivered To Him.</p>
54.	Use Of B.I.S. Specifications	In Case Where No Particular Specification Is Given For Any Article To Be Used Under The Contract, The Relevant Specification, Where One B.I.S. Exists, Of The BeaurOOf Indian Standards Shall Apply.
PART – III <u>WORK PROCEDURE</u>		
55.	Possession Of Site And Access Thereto.	<p>The Corporation Will, With The Engineer's Notice To Commence The Works, Give To The Contractor Possession Of The Site.</p> <p>Such Access, As Is In Accordance With The Contract, Is To Be Provided By The Corporation As May Be Required To Enable The Contractor To Commence And Proceed With The Execution Of The Works In Accordance With The Programme Referred To In Clause 86 If Any, And Otherwise In Accordance With Such Reasonable Proposals As The Contractor Shall, By Notice To The Engineer Make.</p> <p>The Corporation Will, From Time To Time As The Works Proceed, Give To The Contractor Possession Of Such Further Portions Of The Site As May Be Required To Enable The Contractor To Proceed With The Execution Of The Works With Due Dispatch In Accordance With Such Programme Or Proposals, As The Case May Be.</p>

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56.	Failure To Give Possession	The Contractor Should Note That The Site For Work May Be Made Available By The Corporation In Full Or In Part And That The Contractor Shall Plan His Works To Commensurate With The Handing Over The Site. No Claim Of Compensation On Account Of Delay In Making Available The Site Shall Be Payable To The Contractor. However, Time Extension For Completing The Work Shall Be Given To The Contractor In Case Of Such Delay.
57.	Unforeseeable Physical Obstructions Or Conditions	If, However, During The Execution Of The Works The Contractor Encounters Physical Obstructions Or Physical Conditions, Other Than Climatic Conditions On The Site, Which Obstructions Or Conditions Were, In His Opinion, Not Foreseeable By An Experienced Contractor, The Contractor Shall Forthwith Give Notice Thereof To The Engineer. On Receipt Of Such Notice, The Engineer Shall, If In His Opinion Such Obstructions Or Conditions Could Not Have Been Reasonably Foreseen By An Experienced Contractor, After Due Consultation With The Contractor, Determine: Any Extension Of Time To Which The Contractor Is Entitled Under Clause 80.
58.	Drawings: Custody Of Drawings	The Drawings Shall Remain In The Sole Custody Of Engineer, But Two Copies Thereof Shall Be Furnished To The Contractor Free Of Charge. The Contractor Shall Provide And Make At His Own Expense Any Further Copies Required By Him. At The Completion Of The Contract, The Contractor Shall Return To The Engineer All Drawings Provided Under The Contract.
59.	One Copy Of Drawing To Be Kept On Site.	One Copy Of The Drawings, Furnished To The Contractors As Aforesaid, Shall Be Kept By The Contractor On The Site And The Same Shall At All Reasonable Times Be Available For Inspection And Use By The Engineer And The Engineer's Representative And By Any Other Persons Organisation By The Engineer In Writing.
60.	Discrepancies In Drawings Or Specifications	The Drawings And Specifications Are To Be Considered As Mutually Explanatory Of Each Other, Detailed Drawings Being Followed In Preference To Small Scale Drawings And Figured Dimensions In Preference To Scale And Special Conditions In Preference To General Conditions. Special Conditions Or Dimensions Given In The Specifications Shall Supersede All Else. Should Any Discrepancies, However Appear, Or Should Any Misunderstanding Arise As To The Meaning And Import Of The Said Specifications Or Drawings, Or As To Meaning And As To The To The Dimensions Or The Quality Of The Materials Or The Due And Proper Execution Of The Works, Or As To The Measurement Or Quality And Valuation Of The Works Executed Under This Contract, Or As Extra Thereupon The

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		<p>Same Shall Be Explained By The Engineer Be Binding Upon The Contractor And Contractor Shall Be Execute The Work According Such Explanation (Subject As Aforesaid) And Without Extra Charge Or Deduction To Or From The Contract And Shall Also Do All Such Work And Things As May Be © For The Proper Completion Of Works As Implied By The Drawings And Specifications, Even Though Such Works And Things Are Not Specifically Shown And Described In The Said Drawings And Specifications. The Final Decision Of The Commissioner In Case A Reference Be Made To Him Under Clause No. 89 Be Binding Upon The Contractor And Contractor Shall Execute The Works According To Such Explanation (Subject To Aforesaid) And Shall Also Do All Such Works And Required Things As May Be Necessary For The Proper Completion Of Works As Implied By The Drawings And Specifications, Even Though Such Works And Things Are Not Specifically Shown And Described In The Said Drawings And Specifications.</p>
61.	Engineer To Have Power To Issue Further Drawings Or Instructions	<p>The Engineer Shall Have The Power And Authority From Time To Time And At All Times To Make And Issue Such Further Drawings And To Give Such Further Instructions And Directions As May Appear To Him Necessary Or Proper For The Guidance Of The Contractor And The Good And Sufficient Execution Of The Works According To Terms Of The Specifications And Contractor Shall Receive, Execute Obey And Be Bound By The Same, According To The True Intent And Meaning Thereof, As Fully And Effectually As Though The Same Had Accompanied Or Had Been Mentioned Or Referred To In The Specification. The Engineer May Also Alter Or Vary The Levels Or Position Of Any Works Contemplated By The Specifications, Or May Order Any Of The Works Contemplated Thereby To Be Omitted, With Or Without The Substitution Of Any Other Works In Lieu Thereof, Or May Order Any Work Or Any Portion Of Work Executed Or Partially Executed, To Be Removed, Changed Or Altered, And If Needful, May Order That Other Works Shall Be Substituted Instead thereof And Difference Of Expense Occasioned By Any Such Diminution Or Alteration So Ordered And Directed Shall Be Added To Or Deducted From The Amount Of This Contract As Provided Under The Clause No. 101 And 102.</p> <p>No Work Which Radically Changes The Original Nature Of The Contract Shall Be Ordered By The Engineer And In The Event Of Any Deviation Being Ordered Which In The Opinion Of The Contractor Changes The Original Nature Of Contract He Shall Nevertheless Carry It Out And Disagreement As To The Nature Of The Work And The Rate To Be Paid Therefore Shall Be Resolved In Accordance With Clause No.114.</p> <p>The Time For Completion Of The Works, Shall In The Event Of Any Deviations Resulting In Additional Cost Over The</p>

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		Contract Sum Being Ordered, Be Extended Or Reduced Reasonably By The Engineer. The Engineer's Decision In This Case Shall Be Final.
62.	Levels	All Levels Referred To In Connection With These Works Are Based On Great Trigonometric Survey (G.T.S.) Levels. The Contractor Should Also Keep The Leveling Instrument In Good Working Condition Through Out The Period Of Construction Work On Site.
63.	Setting Out The Work.	The Engineer Shall Supply Dimensioned Drawings, Levels And Other Information Necessary To Enable The Contractor To Set Out The Works. The Contractor Shall Provide All Setting Out Apparatus At His Own Cost, Such As Leveling Instruments In Good Working Condition And Appliances, All Pegs, Ranging Rods, Long Measuring Rods, Marked Metres And Organisation And Each Metre And Organisation Numbered, Pots And Sight-Rails, Boning Rods, Moulds, Templates, Etc. Together With Any Reasonable Number Of Labourers That May Be Reuired And Set Out The Work And Be Responsible For The Accuracy Of The Same. The Contractor Shall Amend At His Own Cost And To The Satisfaction Of The Engineer Any Error Found At Any Stage Which May Arise Through Inaccurate Setting Out. The Contractor Shall Protect And Preserve All Bench Marks Used In Setting Out The Work Till The End Of Defects Liability Period Unless The Engineer Directs Its Early Removal. The Contractor Should Also Keep Leveling Instrument In Good Working Condition Throughout The Period Of Construction Work On Site.
64.	Works Closed Between Sunset And Sunrise Or On Sundays And Holidays	No Work Shall Be Done Between Sunset And Sunrise Or On Sunday Or Municipal Holidays And Except With The Special Sanction Of The Engineer In Writing Previously Obtained And The Withholding Of Such Sanctions Shall Be No Ground Of Complaint On The Part Of Contractor Or Cause For Compensation To Him, Or Excuse For Not Completing The Work Within The Contract Period. The Period Within Which The Work Has To Be Carried Out And Completed Has Been Fixed In Terms Of This Clause With The Provision That The Total Number Of Hours Of Work Permissible Shall Not Exceed 48 Hours In A Week And In No Case More Than 8 Hours On Any Working Day, The Actual Time Within Which The Said Hours Shall Be Worked Being Subject To Mutual Arrangements With The Contractor At The Commencement Of The Works Or From Time To Time As May Be Required And Provided That All Works Shall Be Stopped For Rest And Meals For One Hour At About Mid-Day Exclusive Of The Permissible Hours Aforesaid For The Works. Though Sanction May Be Accorded To The Contractor

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		<p>To Work On Days And At Times Otherwise Normally Non-Permissible Under This Contract, The Contractor Shall Be Required To Bear The Cost For Such Supervision As In The Opinion Of The Engineer May Be Necessary At These Times.</p> <p>It Should Be Distinctly Understood That The Granting Of Permission To Work Extra Hours Or To Work On Sundays And Holidays Will Be Entirely At The Discretion Of The Engineer And Cannot Be Claimed By The Contractor As A Matter Of Right.</p> <p>If On The Other Hand The Engineer Requires That The Work Shall Be Proceeded With On Days And At Times Otherwise Normally Non-Permissible Under This Contract The Contractor Shall Proceed With The Work But He Will Not Be Required In Such Cases To Bear The Cost Of The Municipal Establishment Employed At The Time.</p> <p>The Contractor At All Times During The Continuance Of This Contract Shall In All His Dealings With Local Labour For The Time Being Employed On The Works Contemplated By This Contract Have Due Regard To All Local Festivals And Religious Or Other Customs And All Disputes, Matters And Questions Arising Between The Contractor And Any Of His Agent On The One Hand And Any Local Labour On The Other Hand With Respect To Any Matter Or Thing In Any Way Connected With This Contract Shall Be Decided By The Commissioner Whose Decision Shall Be Final And Binding On All Parties.</p>
65.	Work To Be In Accordance With Contract.	The Contractor Shall Execute And Complete The Works And Remedy Any Defects Therein In Strict Accordance With The Contract To The Satisfaction Of The Engineer.
66.	Duties And Powers Of The Engineer's Representative	<p>The Duties Of The Representative Of The Engineer Are To Check, Watch And Supervise Work And To Test And Examine Any Material To Be Used Or Workmanship Employed In Connection With The Works. He Shall Have No Authority To Relieve The Contractor Of Any Of His Duties Or Obligations Under The Contract Nor To Except As Expressly Provided Here Under Or Elsewhere In The Contract To Order Any Work Involving Delay Or Any Extra Payment By The Corporation Or To Make Any Variation Of Or In The Works.</p> <p>Failure Of The Representative Of The Engineer To Disapprove Any Work Or Material Shall Not Prejudice The Power Of The Engineer Thereafter To Disapprove Such Work Or Material And To Order The Pulling Down, Removal Or Breaking Up Thereof.</p> <p>If The Contractor Shall Be Dissatisfied With Any Decision Of The Representative Of The</p>

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		Engineer He Shall Be Entitled To Refer The Matter To The Engineer Who Shall Thereupon Confirm, Reverse Or Very Such Decision.
67.	Engineer's Decision	The Whole Of The Work Shall Be Under The Direction Of The Engineer, Whose Decision Shall Be Final, Conclusive And Binding On All Parties To The Contract, On All Questions Relating To The Construction And Meaning Of Plans, Working Drawings, Sections And Specifications Connected With The Work.
68.	Instructions To Contractor	<p>The Contractor Or His Agent Shall Be In Attendance At The Site(S) During All Working Hours And Shall Supervise The Execution Of The Works With Such Additional Assistance In Each Trade As The Engineer May Consider Necessary. Orders Given To The Contractor's Agent Shall Be Considered To Have The Same Force As If They Had Been Given To The Contractor Himself.</p> <p>The Engineer Shall Communicate Or Confirm His Instruction To The Contractor In Respect Of The Execution Of Work In A "Works Site Order Book" Maintained In The Office Of The Engineer And The Contractor Or His Authorised Representative Shall Confirm Receipt Of Such Instructions By Signing The Relevant Entries In This Book. If Required By The Contractor He Shall Be Furnished A Certified True Copy Of Such Instruction(S). If The Contractor Fails To Comply With The Instruction(S) Of The Engineer, The Engineer May Impose The Daily Penalty Of Rs.500 (Rupees Five Hundred) For Each Of Such Defaults. This Penalty Will Not Prejudice The Right Of The Municipal Commissioner Or The Engineer To Claim Compensation.</p>
69.	Work Order Book	A Work Order Book Shall Be Maintained On Site And It Shall Be The Property Of Corporation And The Contractor Shall Promptly Sign Orders Given Therein By Engineer Or His Representatives And His Superior Officers And Comply With Them. The Contractor Shall Report The Compliance In Good Time So That It Can Be Checked. The Contractor Will Be Allowed To Copy Out Instruction Therein From Time To Time.
70.	Management Meeting	<p>Either The Engineer Or The Contractors May Require The Other To Attend Management Meeting. The Business Of A Management Meeting Shall Be To Review The Plans For Remaining Works.</p> <p>Engineers Shall Record The Business Of Management Meetings And Is To Provide Copies Of His Record To Those Attending The Meetings. The Responsibility Of The Parties For Actions To Be Taken Is To Be Decided By The Engineer Either At The Management Meetings Or After The Management Meetings And Stated In Writing To All Who Attend The Meetings.</p>
71.	Materials	<p>(A) Material To Be Provided By The Contractor:</p> <p>The Contractor Shall, At His Own Expense, Provide All Materials Required</p>

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	<p>For The Works.</p> <p>All Materials To Be Provided By The Contractor Shall Be In Conformity With The Specifications Laid Down In The Contract And The Contractor Shall, Furnish Proof To The Satisfaction Of The Engineer That The Materials So Comply. Contractor Shall Produce Proof Viz. Challans, Bills, Vouchers Etc. So As To Ensure That The Material Was Brought On Site And Quantities Used As Per The Norms, Specifications Etc.</p> <p>Officers Of The Corporation Concerned With The Work Shall Be Entitled At Any Time To Inspect And Examine Any Material Intended To Be Used In Or On The Works Either On The Site Or At Factory Or Workshop Or Other Places Where Such Materials Are Assembled, Fabricated Or Manufactured Or At Any Place(S) Where These Are Laying Or From Which These Are Being Obtained And The Contractor Shall Give Such Facilities As May Be Required For Such Inspection And Examination. The Materials Brought On Site Outside Working Hours Shall Be Stacked Separately Till They Are Inspected By The Engineer Or His Representative.</p> <p>All Materials Brought To The Site Shall Not Be Removed Off The Site Without The Prior Written Approval Of The Engineer. But Whenever The Works Are Finally Completed The Contractor Shall At His Own Expense Forthwith Remove From The Site All Surplus Materials Originally Supplied By Him.</p> <p>The Contractor Shall, At His Own Expense And Without Delay, Supply To The Engineer Samples Of Materials Proposed To Be Used In The Works. The Engineer Shall Within Seven Days Of Supply Of Samples Or Within Such Further Period As He May Require And Intimated To The Contractor In Writing, Inform The Contractor Whether The Samples Are Approved By Him Or Not. If The Samples Are Not Approved The Contractor Shall Forthwith Arrange To Supply To The Engineer For Approval Fresh Samples Complying With The Specifications Laid Down In The Contract.</p> <p>The Engineer Shall Have Full Powers To Require Removal Of Any Or All Of The Materials Brought To Site By The Contractor Which Are Not In Accordance With The Contract Specifications Or Which Do Not Conform In Character Or Quality To The Samples Approved By Him. In Case Of Default On The Part Of The Contractor In Removing The Rejected Materials, The Engineer Shall Be At Liberty To Have Them Removed By Other Means. The Engineer Shall Have Full Powers To Procure Other Proper Materials To Be Substituted For Rejected Materials And In The Event Of The Contractor Refusing To Comply, He May Cause The Same To Be Supplied By Other Means. All Costs, Which May Attend Upon Such Removal And/Or Substitution Shall Be Borne By The Contractor.</p>
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		<p>Subject As Hereinafter Provided In Clause No.98 All Charges On Account Of Octroi, Terminal Or Sales Tax And Other Duties On Material Obtained For The Works From Any Source Shall Be Borne By The Contractor.</p> <p>The Engineer Shall Be Entitled To Have Tests Carried Out As Specified In The Contract For Any Materials Supplied By The Contractor Other Than Those For Which As Stated Above, Satisfactory Proof Has Already Been Produced, At The Cost Of The Contractor And The Contractor Shall Provide At His Expense All Facilities Which The Engineer May Require For The Purpose.</p> <p>If No Tests Are Specified In The Contract, And Such Tests Are Required By The Engineer The Contractor Shall Provide All Facilities Required For The Purpose And Charges For These Tests Shall Be Borne By The Contractor Only If The Tests Disclose That The Said Materials Are Not In Accordance With The Provision Of The Contract.</p> <p>The Cost Of The Materials Consumed In Test Shall Be Borne By The Contractor In All Cases Except When Otherwise Provided.</p> <p>For Carrying Out Tests On Soil, Cement, Sand, Aggregate, Brick And Concrete Etc. The Standard Will Be As Prescribed In RelavantI.S. The Engineer May Direct The Contractors To Get The Samples Of Materials Tested In CIDCO, PWD, VJTI, IIT, Or Any Approved Laboratory Out Of Those Accredited By National Accreditation Board Of Laboratories, Govt. Of India. The Results Of The Tests Shall Be Binding On The Contractor AndCorporation.In Case The Contractor Disputes The Results Of Tests, It Is Open For Him To Ask For The Re-Testing In Which Case The Cost Shall Be Borne By The Contractor. The Decision Of The EngineerOn Acceptability Or Re-Testing By CorporationOr Testing Again Independently In VJTI Or IIT Will Be Binding On Both The Parties To The Contract.</p>
72.	Stock Materials Required Of	<p>(A)The Contractor Shall At His Own Expense Provide And Furnish Himself With Sheds And Yards In Such Situations And In Such Numbers As, In The Opinion Of The Engineer Are Requisite For Carrying Out The Works Under This Contract, And The Contractor Shall Keep At Each Of Such Sheds And Yards A Sufficient Quantity Of Materials In Stock So As Not To Delay The Carrying Out The Works With Due Expedition And The Engineer And His Sub-Ordinates Shall Have Free Access To The Said Sheds Or Yards At Any Time For The Purpose Of Inspecting The Stock Of Materials So Kept In Hand Any Material Or Article, Which The Engineer May Object To, Shall Not Be Brought Upon Or Used In The Work But Shall Be Forthwith Removed From The Sheds Or Yards By The Contractor At His Own Cost. The Contractor Will However Be Allowed To</p>

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		<p>Use For The Above Purpose The Completed Portion Of The Buildings If Available.</p> <p>(B) General : Cement Brought On Site By The Contractors Shall Be Stored In Waterproof Godown With Two Locks On Each Door. The Key Of One Lock Of Each Door Shall Remain With The Engineer Or His Representative And That Of The Other Lock With The Contractor's Organisation Agent At Site Of Works So That Cement Is Removed From The Godown Only According To Daily Requirements With The Knowledge Of Both The Parties.</p>
73.	Production Of Vouchers	The Contractor Shall, Produce All Quotations, Invoices Vouchers And Accounts Or Receipts Etc. To Prove That The Materials Supplied By Him Are In Conformity With The Specifications Laid Down In The Contract And The Same Are Brought To The Site And Utilized On The Said Works.
74.	Plant And' Equipment	<p>The Contractor Shall Arrange At His Own Expense All Tools, Plant And Equipment Required For Execution Of Works. If Required By The Contractor And If Available The Corporation May Supply Such Of The Tools, Plant And Equipment As Are Available, To The Contractor At The Rates And Terms To Be Specified By The Engineer. No Tools, Plant And Equipment Once Brought To The Work Site Shall Be Removed Without The Written Permission Or Order Of The Engineer, Until He Has Certified The Completion Of The Work.</p> <p>If Any Tools, Plants And Equipment Brought On Site, Are In The Opinion Of The Engineer Inefficient, Bad Or Of Inferior Quality Or Are Unsited For The Works Then Such Tools, Plant And Equipment Shall Not Be Used On The Works But Shall Be Removed By The Contractor At His Own Expense Within Twenty Four Hours After The Service Of A Written Order Or Notice From The Engineer To That Effect And Fresh Tools, Plant And Equipment Be Substituted In Lieu Of That Ordered To Be Removed By The Engineer.</p>
75.	Inspection & Approval	<p>All Works Embracing More Than One Process Shall Be Subject To Examination And Approval At Each Stage Thereof And The Contractor Shall Give Due Notice To The Engineer Or His Organisation Representative When Each Stage Is Ready. In Default Of Such Notice, The Engineer Shall Be Entitled To Appraise The Quality And Extent Thereof.</p> <p>No Work Shall Be Covered Up Or Put Out Of View Without The Approval Of The Engineer Or His Organisation Representative And The Contractor Shall Afford Full Opportunity For Examination And Measurement Of Any Work Which Is About To Be Covered Up Or Out Of View And For Examination Of Foundation Before Permanent Work Is Placed Thereon.</p>

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		The Contractor Shall Give Due Notice To The Engineer Or His Organisation Representative Whenever Any Such Work Or Foundation Is Ready For Examination And The Engineer Or His Representative Shall Without Unreasonable Delay, Unless He Considers It Necessary And Informs The Contractor In Writing Accordingly, Attend For The Purpose Of Examining And Measuring Such Work Or Examining Such Foundations. In The Event Of The Failure Of The Contractor To Give Such Notice He Shall, If Required By The Engineer, Uncover Such Work At The Contractor's Expense. Departmental Officers Concerned With The Works Shall Have Powers At Any Time To Inspect Examine Any Part Of The Works And The Contractor Shall Give Such Facilities As May Be Required For Such Inspection & Examination.
76.	Uncovering And Making Good	No Part Of The Works Shall Be Covered Up Or Put Out Of View Without The Approval Of The Engineer. The Contractor Shall Uncover Any Part Of The Works And/Or Make Opening In Or Through The Same As The Engineer May From Time To Time Direct For His Verification And Shall Reinstate And Make Good Such Part To The Satisfaction Of The Engineer, If Any Such Part Has Been Covered Up Or Put Out Of View After Being Approved By The Engineer And Is Subsequently Found On Uncovering To Be Executed In Accordance With The Contract, The Expenses Of Uncovering And/Or Making Openings In Or Through, Reinstating And Making Good The Same Shall Be Borne By The Corporation. In Any Other Case All Such Expenses Shall Be Borne By The Contractor.
77.	Contractor To Search	The Contractor Shall, If Required By The Engineer In Writing, Search Under The Direction Of The Engineer For The Cause Of Any Defect, Imperfection Or Fault Appearing During The Progress Of The Work Or In The Period Of Maintenance. Unless Such Defect, Imperfection Or Fault Shall Be One For Which The Contractor Is Liable Under The Contract, The Cost Of The Work Carried Out By The Contractor In Searching As Aforesaid Shall Be Borne By The Corporation. If Such Defect, Imperfection Or Fault Shall Be One For Which Contractor Is Liable As Aforesaid, The Cost Of The Work Carried Out In Searching As Aforesaid Shall Be Borne By The Contractor And He Shall In Such Case Repair, Rectify And Make Good Such Defect, Imperfection Or Fault, At His Own Expense.
78.	Default Of Contractor In Compliance	In Case Of Default On The Part Of The Contractor In Carrying Out Such Instruction Within The Time Specified Therein Or, If Non, Within A Reasonable Time, The Corporation Shall Be Entitled To Employ Any Other Persons To Carry Out The Same And All Costs Consequent Thereon Or Incidental Thereto Shall, After Due Consultation With The Corporation And The Contractor, Be Determined By


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		The Engineer And Shall Be Recoverable From The Contractor By The Corporation From Any Monies Due Or To Become Due To The Contractor And The Engineer Shall Notify The Contractor Accordingly.
79.	Urgent Works	If Any Urgent Work (In Respect Whereof The Decision Of The Engineer Shall Be Final And Binding) Becomes Necessary And The Contractor Is Unable Or Unwilling At Once To Carry It Out, The Engineer May By His Own Or Other Work People, Carry It Out As He May Consider Necessary. If The Urgent Work Shall Be Such As The Contractor Is Liable Under The Contract To Carry Out At His Expense All Expense Incurred On It By The Corporation Shall Be Recoverable From The Contractor And Be Adjusted Or Set Off Against Any Sum Payable To Him.


PART – IV

TIME SCHEDULE AND DELAYS


80.	Commencement Time	The Time Allowed For Execution For The Works As Specified In The Contract Documents Shall Be The Essence Of The Contract. The Execution Of The Works Shall Commence From The Date Specified By The Engineer In Writing. If The Contractor Fails Or Neglects To Commence The Execution Of The Works As Aforesaid, The Corporation Shall Without Prejudice To Any Other Right Or Remedy Be At Liberty To Forfeit The Security Deposit Absolutely.
81.	Extension Of Time For Completion Due To Monsoon.	<p>In Any Case Where The Time Prescribed For Completion Of Any Work Is Exclusive Of Monsoon Period. No New Trench Work Should Be Started After 15th May And Existing Trenches Are Required To Be Reinstated By 31st May Every Year. The Site Shall Be Cleared In All Respect Including Removal Of Surplus Material On Or Before 10th June Of Every Year. The Monsoon Period Shall Be Deemed To Be From 10th June To 30th Sept. Of The Calendar Year.</p> <p>However, If The Contractor Is Permitted By The Engineer To Work During Any Monsoon Period, All Such Period Shall Be Taken Into Account For The Calculating The Contract Period On Pro-Rata Basis As Under.</p> <p>Cost Of Work Done Effective During Monsoon</p> $\frac{\text{Days}}{\text{Total Cost Of Contract Work}} = \frac{\text{X}}{\text{No. Of Days Of Contract Period}}$

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		In The Event Of The Contractor Failing To Comply With This Condition. He Shall Be Liable To Pay As Compensation As Stated In Clause No.90.
82.	Extension Of Time Due To Unforseen Events	<p>If The Work Be Delayed By –</p> <p>(A) Force Measure Such As Acts Of God, Act Of Public Enemy, Act Of Government, Floods, Epidemics Etc. Or</p> <p>(B) Abnormally Bad Weather, Or</p> <p>(C) Serious Loss Or Damage By Fire Or</p> <p>(d) Civil Commotion, Local Combination Of Workmen, Strike Or Lockout Affecting Any Of The Trades Employed On The Work, Or</p> <p>(e) Delay On The Part Of Other Contractor Or Tradesmen Engaged By The Municipal Corporation In Executing Works Not Forming Part Of The Contract Or</p> <p>(F) The Reasons Stated In Condition No 84 And 85.</p> <p>(G) Any Other Cause, In The Absolute Discretion Of The Engineer.</p> <p>Then Upon The Happening Of Any Such Event Causing Delay, The Contractor Shall Immediately Give Notice There Of In Writing To The Engineer But Shall Nevertheless Use Constantly His Best Endeavors To Prevent Or Make Good The Delay And Shall Do All That May Be Reasonable Required To The Satisfaction Of The Engineer To Proceed With The Work.</p> <p>Request For Extension Of Time, To Be Eligible For Consideration Shall Be Made By The Contractor In Writing Within 14 (Fourteen) Days Of The Happening Of The Event Causing Delay. The Contractor May Also, If Practicable Indicate In Such A Request The Period For Which Extension Is Desired. In Any Such Case, The Engineer May Give A Fair Reasonable Extension Of Time For Completion Of Individual Items Or Groups Of Items Of Work For Which Separate Periods Of Completion Are Specified In The Contract Or The Contract As Whole. The Decision Of The Engineer In Regard To The Extension Will Be Communicated To The Contractor In Writing Within A Reasonable Time And The Contractor Shall Also Be Paid Such Compensation That In The Opinion Of The Engineer Is Fair And Reasonable To Cover The Delays Resulting From The Provisions Under The Sub Clause (E) Above.</p> <p>The Time Extended For Completing The Work Shall Be The Essence Of The Contract For The Period Extended.</p>

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83.	Network Schedule & Monthly Progress Reports	<p>(A) On Award Of The Contract, The Contractor Shall Submit The Time Schedule For The Works In The ‘ Form Of PERT Net Works Or Bar Chart.</p> <p>(B) The Schedules Shall Be Prepared In Direct Relations To The Time Stated In The Contract Documents For Completion Of Items Or Groups Of Items Of Work And Or The Contract As A Whole. It Shall Indicate The Dates Of Commencement And Completion Of Various Activities Of The Work. And Should Contain No Activities With A Duration Greater Than 28 Days. Milestones Would Be So Determined That At Least 10 Percent Of The Events Are Milestones And No Two Milestones Are More Than 3 Months Apart.</p> <p>The Engineer May Approve The Schedule As Submitted Or Suggest Modifications As He Thinks Necessary. The Contractor Shall Modify The Chart Accordingly And Obtain Engineer’s Approval.</p> <p>(C) The Finalized Network May Be Amended From Time To Time, If Felt Necessary By The Contractor, With The Approval Of The Engineer.</p> <p>(D) A Fixed Sum Shall Be Held In Abeyance At The Time Of The Next Interim Payment For Non-Attainment Of Each Milestone In The Network And Shall Be Released Only On Completion Of The Work After Deducting The Compensation For Delay If There Is Contractor’s Fault As Per Provision In Clause No. 86 And Penalty Covered Under Clause No. 53. The Fixed Sum Shall Be:</p> <p>Rs.10,000/- For All Contracts Over Rs.25 Lakhs And Upto The Value Of Rs.100 Lakhs. Rs.20,000/- For All Contracts Over Rs. 1 Crore And Upto The Value Of Rs.5 Crores Rs.35,000/- For All Contracts Over Rs. 5 Crores And Upto The Value Of Rs.10 Crores. Rs.50,000/- For All Contracts Over Rs.10 Crores.</p> <p>If The Attainment Of The Milestones Is Delayed For Reason Not Attributable To The Contractors No Moneys Will Be Held In Abeyance.</p>
84.	Disruption Of Progress For Lack Of Drawings.	<p>The Contractor Shall Give Written Notice To The Engineer Whenever Planning Or Progress Of The Works Is Likely To Be Delayed Or Disrupted Unless Any Further Drawing Or Order, Including A Direction, Instruction Or Approval, Is Issued By The Engineer Within A Reasonable Time. The Notice Shall Include Details Of The Drawing Or Order Required And Of Why And By When It Is Required And Of Any Delay Or Disruption Likely To Be Suffered If It Is Late.</p>

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85.	Delays Drawings	Of	If By Reason Of Any Failure Or Inability Of The Engineer To Issue Within A Time Reasonable In All The Circumstances Any Drawing Or Order Requested By The Contractor In Accordance With The Clause 84 Of This Condition The Contractor Suffers Delay, Then The Engineer Shall Take Such Delay Into Account In Determining Any Extension Of Time To Which The Contractor Is Entitled Under Sub-Clause (G) Of Clause No. 82 Hereof. No Monetary Claim Will Be Entertained On This Account.
86.	Monthly Report		The Contractors Will Be Required To Submit The Monthly Progress Reports By The 2 nd Day Of The Following Month To The Engineer Failure On The Part Of The Contractor To Submit Monthly Report In Time Will Attract Action As Per Clause No.83.
87.	Rate Progress.	Of	If For Any Reason, Which Does Not Entitle The Contractor To An Extension Of Time, The Rate Of Progress Of The Works Or Any Section Is At Any Time, In The Opinion Of The Engineer, Too Slow To Comply With The Time For Completion, The Engineer Shall So Notify The Contractor Who Shall Thereupon Take Such Steps As Are Necessary, Subject To The Consent Of The Engineer, To Expedite Progress So As To Comply With The Time For Completion. The Contractor Shall Not Be Entitled To Any Additional Payment For Taking Such Steps. If, As A Result Of Any Notice Given By The Engineer Under This Clause, The Contractor Considers That It Is Necessary To Do Any Work At Night Or On Locally Recognized Days Of Rest, He Shall Be Entitled To Seek The Consent Of The Engineer So To Do. Provided That If Any Steps, Taken By The Contractor In Meeting His Obligations Under This Clause, Involve The Corporation In Additional Supervision Costs, Such Costs Shall Be Determined By The Engineer And Shall Be Recoverable From The Contractor, And May Be Deducted By The Corporation From Any Monies Due Or To Become Due To The Contractor And The Engineer Shall Notify The Contractors Accordingly.
88.	Suspension Work	Of	(A)The Contractor Shall, On Receipt Of The Order In Writing Of The Engineer, Suspend The Progress Of The Works Or Any Part Thereof For Such Time And In Such Manner As The Engineer May Consider Necessary For Any Of The Following Reasons: - (I) On Account Of Continued Non-Compliance Of The Instructions Of The Engineer Or Any Other Default On The Part Of The Contractor, Or Ii) For Proper Execution Of The Works Or Part Thereof For Reasons Other Than The Default Of The Contractor,

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		<p>Or</p> <p>(Iii)For Safety Of The Works Or Part Thereof. The Contractor Shall, During Such Suspension, Properly Protect And Secure The Works To The Extent Necessary And Carry Out The Instructions Given In That Behalf By The Engineer.</p> <p>(B) If The Suspension Is Ordered For Reasons (Ii) And (Iii) In Sub-Para (A) Above, The Contractor Shall Be Entitled To An Extension Of Time Equal To The Period Of Every Such Suspension Plus A Reasonable Time As Decided By The Engineer.</p> <p>I If The Suspension Is Ordered For Reasons Of (I) In Sub-Para (A) Above, The Engineer Shall Have Powers To Suspend The Payment Under The Contract. Such Suspension Of Payment May Be Continued Until Default Shall Have Been Rectified.</p>
89.	Stoppage / Alteration / Restriction Of Work.	<p>1) If At Any Time After The Execution The Contract Documents The Engineer Shall For Any Reason Whatsoever (Other Than Default On The Part Of Contractor For Which The Corporation Is Entitled To Rescind The Contract) Desires That The Whole Or Any Part Of The Work Specified In The Tender Should Be Suspended For Any Period Or That The Whole Or Part Of The Work Should Not Be Carried Out, At All He Shall Give To The Contractor A Notice In Writing Of Such Desire And Upon The Receipt Of Such Notice The Contractor Shall Forthwith Suspend Of Stop The Work Wholly Or In Art As Required, After Having Due Regard To The Appropriate Stage At Which The Work Should Be Stopped Or Suspended So As Not To Cause Any Damage Or Injury To The Work Already Done Or Endanger The Safety There Of Provided That The Decision Of The Engineer As To The Stage At Which The Work Or Any Part Of It Could Be Or Could Have Been Safely Stopped Or Suspended Shall Be Final And Conclusive Against The Contractor. The Contractor Shall Have No Claim To Any Payment Or Compensation Whatsoever By Reason Of Or In Pursuance Of Any Notice As Aforesaid, On Account Of Any Suspension, Stoppage Or Curtailment Except To The Extent Specified Hereinafter.</p> <p>2) Where The Total Suspension Of Work Ordered As Aforesaid Continued For A Continues Period Exceeding 90 Days The Contractor Shall Be Liberty To Withdraw From The Contractual Obligations Under The Contract So Far As It Pertains To Unexecuted Part Of The Work By Giving A 10 Days Prior Notice In Writing To The Engineer, Within 30 Days Of The Expiry Of The Said Period Of 90 Days, Of Such Intention And Requiring The Engineer To Record The Final Measurement Of The Work Already Done And To Pay Final Bill. Upon Giving Such Notice The Contractor Shall Be Deemed To Have Been Charged From His Obligations To Complete The Remaining Unexecuted Work Under His</p>

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		<p>Contract. On Receipt Of Such Notice The Engineer Shall Proceed To Complete The Measurements And Make Such Payments As May Be Finally Due To The Contractor Within A Period Of 90days From The Receipt Of Such Notice In Respect Of The Work Already Done By The Contractor. Such Payment Shall Not In Any Manner Prejudice The Right Of The Contractor To Any Further Compensation Under The Remaining Provisions Of This Clause.</p> <p>3) Where The Engineer Required The Contractor To Suspend The Work For A Period In Excess Of 30 Days At Any Time Or 60 Days In The Aggregate, The Contractor Shall Be Entire To Apply To The Engineer Within 30 Days Of The Resumption Of Work After Such Suspension For Payment Of Composition To The Extent Of Pecuniary Loss Suffered By Him In Respect Of Working Machinery Remain Ideal On The Site Of On The Account Of His Having And To Pay The Salary Or Wages Of, Labour Engaged By Him During The Said Period Of Suspension Provided Always That The Contractor Shall Not Be Entitled To Any Claim In Respect Of Any Such Working Machinery, Salary Or Wages For The First 30 Days Whether Consecutive Or In The Aggregate Or Such Suspension Or In Respect Or Any Suspension Whatsoever Occasioned By Unsatisfactory Work Or Any Other Default On His Part. The Decision Of The Engineer In This Regard Shall Be Final And Conclusive Against The Contractor.</p> <p>4) In The Event Of –</p> <p>i) Any Total Stoppage Of Work On Notice From Engineer Under Sub Clause (1) In That Behalf.</p> <p>ii) Withdrawal By The Contractor From The Contractual Obligations Complete The Remaining Unexecuted Work Under Sub Clause (2) On Account Of Continued Suspension Of Work For A Period Exceeding 90 Days.</p> <p>It Shall Be Open To The Contractor, Within 90 Days From The Service Of (I) The Notice Of Stoppage Of Work Or (Ii) The Notice Of Withdrawal From The Contractual Obligations Under The Contract On Account Of The Continued Suspension Of Work (Iii) Notice Under Clause 20 (1) Resulting In Such Curtailment To Produce To The Engineer Satisfactory Documentary Evidence That He Had Purchased Or Agreed To Purchase Material For Use In The Contracted Work, Before Receipt By Him Of The Notice Of Stoppage, Suspension Or Curtailment And Require Government To Take Over On Payment Such Material At The Rated Determine By The Engineer Provided, However, Such Rates Shall In No Case Exceed The Rates At Which The Same Was Acquired By The Contractor. The Corporation Shall Thereafter Take Over The Materials So</p>
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		Offered, Provided The Quantities Offered, Are Not In Excess Of The Requirements Of The Unexecuted Work As Specified In The Accepted Tender And Are Of Quality And Specifications Approved By The Engineer.
90.	Liquidated Damages For Delay.	<p>If The Contractor Fails To Complete The Works And Clear The Site On Or Before The Contract Or Extended Date(S)/Period(S) Of Completion, He Shall, Without Prejudice To Any Other Right Or Remedy Of Corporation On Account Of Such Breach, Pay As Agreed Compensation, Amount Calculated As Stipulated Below (Or Such Smaller Amount As May Be Fixed By The Engineer) On The Contract Value Of The Whole Work Or On The Contract Value Of The Item Or Group Of Items Of Work For Which Separate Period Of Completion Are Given In The Contract And Of Which Completion Is Delayed For Every Week That The Whole Of The Work Of Item Or Group Of Items Of Work Concerned Remains Uncompleted, Even Though The Contract As A Whole Be Completed By The Contract Or The Extended Date Of Completion. For This Purpose The Term "Contract Value" Shall Be The Value Of The Work At Contract Rates As Ordered Including The Value Of All Deviations Ordered:</p> <p>(A) Completion Period For @ 1 Percent (Originally Stipulated Per Week Or As Extended) Not Exceeding 6 Months</p> <p>(B) Completion Period For @ 1/2 Percent (As Originally Stipulated Per Week As Extended) Exceeding 6 Months And Not Exceeding 2 Years</p> <p>(C) Completion Period (As @ ¼ Percent Originally Stipulated Per Week Or As Extended) Exceeding 2 Years</p> <p>The Under Noted Percentage Of The Contract Value Of The Item Or Group Of Items Of Work For Which A Separate Period Of Completion Is Given. When The Delay Is Not A Full Week Or In Multiple Of A Week But Involves A Fraction Of A Week The Compensation Payable For That Fraction Shall Be Proportional To The Number Of Days Involved. Provided Always That The Total Amount Of Compensation For Delay To Be Paid This Condition Shall Not Exceed</p> <p>(A) Completion Period (As 10 Percent Originally Stipulated Or As Extended). Not Exceeding 6 Months</p> <p>(B) Completion Period 7 ½ Percent</p>

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		<p>(As Originally Stipulated Or As Extended) Exceeding 6 Months And Not Exceeding 2 Years</p> <p>(C)Completion Period 5 Percent (As Originally Stipulated Or As Extended) Exceeding 2 Years</p> <p>The Amount Of Liquidated Damages May Be Adjusted Set Off Against Any Sum Payable To The Contractor Under This Or Any Other Contract With The Corporation Or From The Security Deposit Of The Contractor Entirely At The Discretion Of The Corporation.</p>
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PART – V
BILLS AND PAYMENTS


91.	Method Of Measurement	Except Where Any General Or Detailed Description Of The Work In Bills Of Quantities Or Schedule Of Works/Items/Quantities Expressly Shown To The Contrary, Bills Of Quantities Shall Be Deemed To Have Been Prepared And Measurements Shall Be Taken In Accordance With The Procedure Set Forth In The Schedule Of Rates /Specifications Notwithstanding Any Provision In The Relevant Standard Method Of Measurement Or Any General Or Local Custom. In The Case Of Items, Which Are Not Covered By The Schedule Of Rates/ Specifications, Measurement Shall Be Taken In Accordance With The Relevant Standard Specifications Published By PWD Govt. Of Maharashtra And For The Works Not Covered In This Publication, Measurements Shall Be Taken As Per The Codes By Bureau Of Indian Standards. .
92.	Records And Measurement	The Contractor Shall Submit To The Engineer The Monthly Statements Of The Estimated Value Of The Work Completed Less Than The Cumulative Amount Certified Previously. The Monthly Statements Shall Be In The Bill Form Specified By The Engineer And It Shall Be Submitted On Or Before The Date Instructed By The Engineer. These Monthly Bills Shall Be Supported With Detailed Measurements For The Gross Quantity Of The Work Done Duly Deducting The Gross Quantity Paid In The Previous Bill. The Contractor Is Permitted To Copy Down The Corrections In The Bills Paid As Per The Engineers Certification. Upon Receipt Of The Bill And Measurements By The Contractors, The Engineer Shall Except As Otherwise Stated Ascertain And Determine By Measurement The Value In Accordance With The Contract Of Work Done In Accordance Therewith.

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		<p>All Items Having A Financial Value Shall Be Entered In Measurement Book Etc. As Prescribed By The Corporation So That A Complete Record Is Obtained Of All The Works Performed Under The Contract.</p> <p>Measurements Shall Be Taken Jointly By The Engineer Or His Organisation Representative And By The Contractor Or His Organisation Representative. Before Taking Measurements Of Any Work The Engineer Or The Person Deputed By Him For The Purpose Shall Give A Reasonable Notice To The Contractor. If The Contractor Fails To Attend Or Send An Organisation Representative For Measurement After Such A Notice Or Fails To Countersign Or The Objection Within A Week From The Date Of Measurement , Then In Any Such Event Measurement Taken By The Engineer Or By The Person Deputed By Him Shall Be Taken To Be Correct Measurements Of The Works And Shall Be Binding On The Contractor.</p> <p>The Contractor Shall, Without Any Extra Charge, Provide Assistance With Every Appliance And Other Things Necessary For Measurements.</p> <p>Measurements Shall Be Signed And Dated By Both Parties Each Day (Of Taking Measurement) On The Site On Completion Of Measurement.</p>
93.	Payments Of Bills And Other Claims	The Payment Of Bills And Other Claims Arising Out Of The Contract Will Be Made By Account Payee Cheque Drawn In The Name Of 'Agency'.
94.	Full Provisions	<p>The Rates Inserted By The Corporation Against Various Items Of Work Detailed In Various Parts Of Scheduled Shall Be Deemed To Include Every Allowance Necessary, Without Extra Measurement Or Charge For Meeting The Requirement Of Various Components/ Parts Of The Contract Documents (Viz Particular Specifications, PWD Of Standard Specifications, Maharashtra Schedule Of Rates, MOST Specifications, BIS Specifications, Special Conditions, Preambles And Notes To Schedule Of Items Description Of Schedule Items Which Shall All Be Read Together And Any Or Of The Following Unless Specifically Provided For The Contrary.</p> <p>a) Compliance With All The Conditions Of Contract Including General Conditions Of Contract, Schedule Of Rates And Quantities, Particular Specifications, Drawings Including Notes Thereon, Specifications In Standard Specifications Of PWD Of Maharashtra And MJP Relevant Indian Standard Specifications Wherever Applicable. However, In Case Of Any Discrepancy</p>

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	<p>Between Drawing And Tender, The Tender Item And Specification Shall Prevail. If There Is Discrepancy In Tender Specifications, The Order Of Preference Shall Be 1st Specification Of Maharashtra State PWD, MJP, MOST And Lastly BIS.</p> <p>b) All Labour, Materials, Tool And Plants, Equipments And Transport Which May Be Required In Preparation For And In The Full And Entire Execution And Completion Of The Works Including Waste Of Materials, Carriage And Cartage, Carrying In, Return Of Empties, Hoisting, Setting, Fixtures And Fittings In Position.</p> <p>c) Local Conditions: Nature Of Works, Local Facilities For Supply Of Labour And Materials Accessibility's To Sites And All Other Matters Effecting The Execution And Completion Of The Works.</p> <p>d) Duties Etc: Payments Of Any Octroi, Terminal Tax, Sales Tax, Turnover Tax, Contract Sales Tax, Toll Tax, Ground Rent, Royalty, Environmental Cess, Local Bodies Cess, Taxes Or Any Duties On Materials Obtained For The Works And Any Duties In Respect Of Patent Rights.</p> <p>e) Supervision :Competent Supervision Of The Work.</p> <p>f) Labour: Reasonable Terms And Conditions Of Employment, Liability To Pay Compensation, Wages As Per Statutory Enactment's, Temporary Accommodation, Sanitation, Compliance With Contract Labour Act <u>1970</u> (Regulation And Abolition).</p> <p>g) Water: Provision Of All Water Required Including Temporary Plumbing And Connection.</p> <p>h) Temporary Work Shops, Stores, Offices, Labour Camps Etc. Provisions Of Such Structures Required For Efficient Execution Of The Works And Removing And Cleaning Up Site On Completion Of Works.</p> <p>i) Precautions Against Risks: Precautions To Prevent Loss Or Damage From All Or Any Risk, Insurance Of Sheds Or Any Temporary Accommodation Provided By The Corporation Watching And Lighting, Provisions Pertaining To The General Conditions Of Contract.</p> <p>j) Notices, Fees Etc.: Compliance With Statutory Provisions Of Regulations And/ Or Bye Laws Of Any Local Authority And/ Or Any Public Service Company Or Authority Affected By The Works.</p>
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		<p>k) Setting The Works Including All Apparatus Required.</p> <p>l) Site Drainage: Removal Of All Water That May Accumulate Due To Spring, Sub Soil Water, Flood/Tides And Any Other Causes On The Site During The Progress Of The Work.</p> <p>m) Execution Of Work In Workmanlike Manner, Facilities For Inspection Etc.</p> <p>n) Rectification Of Bad Work: Rectification And/ Or Removal And Reconstruction Of Any Work Which (As Decided By The Engineer) Has Been Executed With Unsound Or Imperfect Materials Or Unskilled Workmanship Or Of A Quality Inferior To That Contracted For, Whether During Construction Or Reconstruction Prior To The Expiry Of The Defect Liability Period.</p> <p>o) Responsibility For Damages And Loss Of All Construction Materials Etc., At The Site Until Handing Over To The Corporation.</p> <p>p) Removal Of Rubbish: Removal Of Rubbish & Debris & Cleaning Of Any Dirt Before Handing Over All Completion Of Works.</p> <p>q) Cleaning Site And Works: Removal By The Contractor Off The Site, Of Any Tools, Plats & Materials And Sweeping Building, Washing Floors, Cleaning Joineries & Removal Of Splashes Of Asphalt Leaving The Whole Site Neat And Tidy.</p> <p>r) Completion: Completing The Work To The Satisfaction Of The Engineer On Or Before Stipulated The Date Of Completion.</p> <p>s) Difficult Position: Accessibility Or Otherwise To Site, Easy Or Difficult Position In Works.</p> <p>t) Errors: Rectification Of All Defects During Construction & Defect Liability Period To The Satisfaction Of Engineer.</p> <p>u) Curved Works Etc. Works Of Any Quantity, Size Or Shape Whether Level, Inclined, Curved, Battered Etc.</p> <p>v) Maker's Instruction: Compliance With Make's Instructions In The Case Of Proprietary Articles, Factory Made Good Of Precast Items.</p> <p>w) Waste: All Waste Laps, Seams, Joints (Rough Or Fair Cutting) Straight/ Raking, Circular And Making Good.</p> <p>x) Artificial Lights: To Include All Lighting/Kerosene Or Electric Power As The Case May</p>
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		<p>Be When Need Arises For Use Of Lighting While Carrying Out Works.</p> <p>Construction Of Approaches To The Site Of Work. Making Arrangements For Proper Access To Works In The Form Of Stairs, Ladders, Lifts Etc. As Ordered By The Engineer – In – Charge For Proper Supervisions, Testing And Or Inspection Of Works Including Material During Construction & Defect Liability Period.</p>
95.	Interim Payment	<p>Interim Bills Shall Be Submitted By The Contractor From Time To Time (But At An Interval Of Not Less Than One Month) For The Works Executed. The Engineer Shall Arrange To Have The Bills Verified By Taking Or Causing To Be Taken, Where Necessary, The Requisite Measurement Of Work. The Joint Measurement Shall Not Be An Excuse For The Contractor To Submit Intermediate Bills At Monthly Or Intervals Not Less Than A Month. All Interim Bills Shall Be First Submitted By The Contractor With Detailed Measurements And Thereafter Only The Engineer Or His Organisation Representative Shall Carry Out Joint Verifications Or Otherwise On Record In The Measurement Book Before Certification Of The Bills.</p> <p>Payment On Account For Amount Admissible Shall Be Made On The Engineer Certifying The Sum To Which The Contractor Is Considered Entitled By Way Of Interim Payment For All The Work Executed, After Deducting There From The Amount Already Paid, The Security Deposit/Retention Money And Such Other Amounts As May Be Deductible Or Recoverable In Terms Of The Contract.</p> <p>No Interim Payment Will Be Admitted Until Such Time The Contractor Have Fully Complied With The Requirement Of The Condition 84 Concerning Submission And Approval Of Network Schedule For The Works, As Detailed In Condition 83. A Fixed Sum Shall Be Held In Abeyance At The Time Of Next Interim Payment For Non Attainment Of Each Milestone In The Network And Shall Be Released Only On Attainment Of The Said Milestone</p>
96.	Modification Of Interim Certificate.	<p>An Interim Certificate Given Relating To Work Done Or Material Delivered May Be Modified Or Corrected By Any Subsequent Interim Certificate Or By The Final Certificate. No Certificate Of The Engineer Supporting An Interim Payment Shall Of Itself Be Conclusive Evidence That Any Work Or Materials To Which It Relates Is/Are In Accordance With The Contract.</p>
97.	Income Tax	<p>The Contractor Shall Pay Indian Income Tax On All Payments Made To Him Under The Contract, Other Than</p>

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		Reimbursements Made To Him By The Corporation To Cover Payment By Contractor Of Minor Custom Duties Etc., Or Any Other Payment Which The Contractor May Make On The Corporation's Behalf. Under The Provisions Of Sec. 194-C Of The Indian Income Tax Act, The Corporation Is Required To Deduct Tax With Surcharge At Source At Prevailing Rates From The Gross Amount Of Each Bill Submitted. Any Expatriate Site Staff Or Staff Not Normally Residents Of India, Employed By The Contractor Shall Pay Personal Income Tax On All Money Earned And Paid In India. The Contractor Shall Perform Such Duties In Regard To Such Deductions Thereof As May Be Imposed On Him By Such Laws And Regulations.
98.	Payment Of Taxes	<p>The Contractor Shall Pay All The Taxes Directly To Respective Organizations & To The Government. The Corporation Shall Not Take Any Responsibility For Any Kind Of Tax Payment To The Government Or Semi Government Bodies At Any Point Of Time.</p> <p>The Prices Quoted By The Contractor Shall Include All Customs Duties, Import Duties, Excise Duties, Business Taxes, Income And Other Taxes That May Be Levied In Accordance To The Laws And Regulation In-Force On The Contractor's Equipment, Materials, Supplies (Permanent, Temporary And Consumables) To Be Used On Or Furnished Under The Contract And On The Services To Be Performed Under The Contract. Nothing In The Contract Shall Relieve The Contractor From His Responsibility To Pay Any Tax That May Be Levied Or On Profits Made By Him In Respect Of The Contract. The Contractor Shall Perform Such Duties In Regard To Such Deductions Thereof As May Be Imposed On Him By Such Laws And Regulations.</p> <p>All C Charges On Account Of Octroi, Terminal Or Sales Tax And Other Duties On Material Obtained For The Works From Any Source Including The Tax Applicable As Per Maharashtra Sales Tax Act On The Transfer Of Property In The Goods Involved In The Execution Of Works Contract (Re-Enacted) Act, 1991 Etc. Shall Be Borne By The Contractor. Under The Provisions Of The Maharashtra Sales Tax Act, The Corporation Is Required To Deduct Turnover Tax At Source At The Rates Prevailing At The Time Of Payments.</p> <p>The Contractor Shall Submit Form – 31 Or Such Other</p>

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		Forms As Are Prescribed Under The Said Act Which Is Required To Be Produced By The Principle Employer In The Events Of Any Notice By The Sales Tax Department Within One Month Of Issue Of Letter Of Acceptance.
99.	Deduction Of Contract Sales Tax / Turnover Tax.	The Contractors Are Required To Produce Their Registration For Contract Sales Tax/Turnover Tax To The Department Before Releasing The 1 st R.A. Bill For The Work Executed By Them, Failing Which, No Payment Shall Be Release.
100.	Provisional Sums.	<p>(1)"Provisional Sum" Means A Sum Included In The Contract And So Designated In The Bill Of Quantities For The Execution Of Work Or Supply Of Goods, Materials Or Services Or For Contingencies, Which Sum May Be Used, In Whole Or In Part, Or Not At All, At The Direction And Discretion Of The Engineer. The Contract Price Shall Include Only Such Amounts In Respect Of The Work, Supply Or Service To Which Such Provisional Sum Relate As The Engineer Shall Approve Or Determine In Accordance With This Clause.</p> <p>(2) In Respect Of Every Provisional Sum The Engineer Shall Have Power To Order To Execute The Work, Including Goods, Materials Or Services To Be Supplied By The Contractor. The Contract Price Shall Include The Value Of Such Work Executed Or Such Goods, Material Or Services Supplied Determined In Accordance With Clause No. 102.</p> <p>(3) The Contractor Shall Produce All Quotations, Invoices, Vouchers And Accounts Or Receipts In Connection With Expenditure In Respect Of Provisional Sums.</p>
101.	Rates For Excess Items.	<p>Quantities Shown In The Tender Are Approximate And No Claim Shall Be Entertained For Quantities Of Work Executed Being Either More Or Less Than Those Entered In The Tender Or Estimate. For Purpose Of This Contract, The Variations/Deviations In Carrying Out The Items Of Work Shall Not Exceed Plus Or Minus 25 Percent Of Contract Sum. The Deviation/Variation In The Quantity Of Individual Items Shall Not Be Taken As Deviation Or Variation In The Contract. The Difference Between The Total Value Of The Work Done And The Contract Sum As Defined Above Will Be Only Be Considered For Deviation/Variation.</p> <p>The Contractor Shall Arrive At The Rates After Carefully Preparing The Rate Analysis Taking Into Consideration Site Conditions. For Increase Upto 25</p>

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		<p>Percent Over The Quantity Shown In The Bill Of Quantities Shall Be Paid At, The Rate Mentioned In The Bill Of Quantities. However, If The Quantity Increases Beyond 25 Percent Of Quantity Shown In The Bill Of Quantities The Excess Quantity Beyond 25 Percent Shall Be Priced As Under:</p> <p>The Rate Shall Be Worked Out Based On Schedule Rate With Contractor'S Quoted Percentage Or Current District Schedule Of Rates Without Contractor'S Quoted Percentage, Which Ever Is Less.</p>
102.	Rates For Extra Items.	<p>Rates For Such Additional Altered Or, Substituted Work Shall Be Determined As Follows:</p> <p>I) If Rate For Additional, Altered Or Substituted Item Of Work Is Specified In The Bill Of Quantities And Rates, The Contractor Shall Carry Out The Additional, Altered Or Substituted Item At The Same Rate, Subject To 100 Above.</p> <p>Ii) If Rate For Any Additional, Altered Or Substituted Item Of Work Is Not Included In The Bill Of Quantities And Rates, Such Item Of Work Shall Be Carried Out At The Relevant Corporation's Schedule Of Rates (Public Works Department And M.J.P. Schedule Of Rates For Thane District) Prevailing At The Time Of Execution Of Extra Work (Quoted Percentage Will Not Be Applicable)</p> <p>Iii) If The Rate For Any Additional, Altered Or Substituted Item Of Work Cannot Be Determined In The Manner Specified In (I) & (Ii) Above, Or The Rate So Determined Is Found To Be Unreasonable, Then The Contractor Will Be Paid At Such Fair And Reasonable Rates As Worked Out By The Engineer On The Basis Of Material, Labour And Operations Of Construction Equipment Required To Execute The Item And Allowing 10 Percent To Cover Profits And Overhead Charges.</p> <p>(Iv) The Contractor Shall Submit To The Engineer His Detailed Rate Analysis For Carrying Out Variation Duly Supported With Quotations And Other Supporting Documents Within 7 Days Of Written Instructions To Carry Out Variations. If The Contractor's Quotation Is Unreasonable, The Engineer Orders The Variation And Makes Change To The Contract Price Which Is Based On His Own Forecast Of The Variations On The Contractor's Cost. In Case, The Rates Decided By The Engineer Are Not Acceptable To The Contractor, He Shall Continue</p>

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		With The Work And Maintain Contemporary Records Of Actual Expenses On Day-To-Day Basis With Joint Assessment/ Verification. The Contractor Is Not Entitled For Payment Of Actual Expenses As Per Joint Records Added With 10% For Profit And Overheads. Disagreement With The Rate Fixed By The Engineer Shall Be Informed By The Contractor Before Commencing The Work Of Variations, Failing Which The Rate Fixed By The Engineer Shall Be Final And Binding On The Parties To Contract.
103.	Overpayment And Underpayment	<p>Whenever Any Claim For The Payment Of A Sum To The Corporation Rises Out Of Or Under This Contract Against The Contractor The Same May Be Deducted By The Corporation From Any Sum Then Due Or Which At Any Time Thereafter May Become Due To The Contractor Under This Contract And Failing That Under Any Contract With The Corporation Or From Any Other Sum Due To The Contractor From The Corporation (Which May Be Available With The Corporation) Or From His Security Deposit/Retention Money, Or He Shall Pay The Claim On Demand.</p> <p>The Corporation Reserves The Right To Carry Out Post Payment Audit And Technical Examination Of The Final Bill Including All Supporting Voucher, Abstracts Etc. The Corporation Further Reserves The Right To Enforce Recovery Of Any Over Payment When Detected.</p> <p>If As A Result Of Such Audit And Technical Examination Any Overpayment Is Discovered In Respect Of Any Work Done By The Contractor Or Alleged To Have Been Done By Him Under The Contract, It Shall Be Recovered By The Corporation From The Contractor By Any Or All Of The Methods Prescribed Above Or If Underpayment Is Discovered The Amount Shall Be Duly Paid To The Contractor By The Corporation.</p> <p>Provided That The Aforesaid Right Of The Corporation To Adjust Overpayment Against Amount Due To The Contractor Under Any Other Contract With Corporation Shall Not Extend Beyond The Period Of Two Years From The Date Of Payment Of The Final Bill Or In Case The Final Bill Is A “Minus” Bill, From The Date Of The Amount Payable By The Contractor Under The “Minus” Bill Is Communicated To The Contractor.</p>

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		Any Amount Due To The Contractor Under This Contract For Underpayment May Be Adjusted Against Amount Then Due Or Which May At Any Time Thereafter Become Due Before Payment Is To The Contractor, From Him To Corporation On Any Other Contract Or Account Whatsoever.
104.	Payment Of Final Bill	<p>Final Joint Measurement Along-With The Representatives Of The Contractor Should Be Taken, Recorded And Signed By The Contractors. Contractor Should Submit The Final Bill Within 1 Month Of Physical Completion Of The Work.</p> <p>If The Contractor Fails To Submit The Final Bill Within 1 Month, The Corporation Staff Will Prepare The Final Bill Based On The Joint Measurement Within Next 3 Months.</p> <p>Engineer's Decision Shall Be Final In Respect Of Claims For Defect And Pending Claims Against Contractors.</p> <p>No Further Claims Should Be Made By The Contractor After Submission Of The Final Bill And These Shall Be Deemed To Have Been Waived And Extinguished. Payment Of Those Items Of The Bills In Respect Of Which There Is No Dispute And Of Items In Dispute, For Quantities And Rates As Approved By The Commissioner Shall Be Made Within A Reasonable Period As May Be Necessary For The Purpose Of Verification Etc.</p> <p>After Payment Of The Final Bill As Aforesaid Has Been Made, The Contractor May, If He So Desires, Reconsider His Position In Respect Of A Disputed Portion Of The Final Bill And If He Fails To Do So Within 84 Days, His Disputed Claim Shall Be Dealt With As Provided In The Contract.</p>


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105.	Receipts To Be Signed In Firm's Name By Any One Of The Partners	Every Receipt For Money Which May Become Payable Or For Any Security Which May Become Transferable To The Contractor Under These Present Shall, If Signed In The Partnership Name By Any One Of The Partners, Be A Good And Sufficient Discharge To The Commissioner And Corporation In Respect Of The Money Or Security Purporting To Be Acknowledged Thereby, And In The Event Of Death Of Any Of The Partners During The Pendency Of This Contract, It Is Hereby Expressly Agreed That Every Receipt By Any One Of The Surviving Partners Shall, If So Signed As Aforesaid, Be Good And Sufficient Discharge As Aforesaid Provided That Nothing In This Clause Contained Shall Be Deemed To Prejudice Or Effect Any Claim Which The Commissioner Or The Corporation May Hereafter Have Against The Legal Representatives Of Any Partners So Dying Or In Respect Of Any Breach Of Any Of The Conditions Thereof, Provided Also That Nothing In This Clause Contained Shall Be Deemed Prejudice Or Affect The Respective Rights Or Obligations Of The Contractor And Of The Legal Representative Of Any Deceased Contractors Interest.
106.	Payment On Account Of Price Variation Of Labour, Material And POL Component	As Per The Separate Clause Attached.
107.	No Payment On Account Of Price Variation Of Labour, Material And POL Component	No Material Price Variation Wages Escalation On Individual Item On Account Whatsoever And Compensation For 'Force Majeure' Etc. Shall Payable Under This Contract.


PART-VI

TERMINATION OF CONTRACT AND SETTELEMENT OF DISPUTES


108.	Cancellation Of Contract In Full Or In Part.	<p>If The Contractor:</p> <p>(A) At Any Time Makes Default In Proceeding With The Work With Due Diligence And Continues To Do So After Notice In Writing Of Fourteen Days From The Engineer; Or</p> <p>B) Commits Default In Complying With Any Of The Terms And Conditions Of Contract And Does Not Remedy It Within Fourteen Days After A Notice In Writing Is Given To Him In That Behalf By The Engineer, Or</p>
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		<p>(C)Fails To Complete The Works Or Items With Individual Dates Of Completion, On Or Before The Date(S) Of Completion, And Does Not Complete Them Within The Period Specified In A Notice Given In Writing In That Behalf By The Engineer, Or</p> <p>(D)Shall Offer Or Give Or Agree To Give To Any Person In Corporation's Service Or To Any Other Person On His Behalf Any Gift Or Consideration Of Any Kind As An Inducement Or Reward For Doing Or Forbearing To Do Or For Having Done Or Forborne To Do Any Act In Relation To The Obtaining Or Execution Of This Or Any Other Contract For The Corporation, Or</p> <p>(E)Shall Obtain A Contract With The Corporation As A Result Of Ring Tendering Or Other Non-Bona-Fide Methods Of Competitive Tendering Or</p> <p>F) Being An Individual Or A Firm, Any Partner Thereof, Shall At Any Time Be Adjudged Insolvent Or Have A Receiving Order Or Order For Administration Of His Estate Made Against Him Or Shall Take Any Proceedings For Liquidation Or Composition (Other Than Voluntary Liquidation For The Purpose Of Amalgamation Or Reconstruction) Under Any Insolvency Act For The Time Being In Force Or Make Any Conveyance Of Assignment Of His Effects Or Composition Or Arrangement For The Benefit Of His Creditors Or Purport So To Do, Or If Any Application Be Made Under Any Insolvency Act For The Time Being In Force For The Sequestration Of His Estate Or If A Trust Deed Be Executed By Him For His Creditors, Or</p> <p>G) Being A Company, Shall Pass A Resolution Or The Court Shall Make An Order For The Liquidation Of His Affairs, Or A Receiver Or A Manager On Behalf Of The Debenture Holders Shall Be Appointed Or Circumstances Shall Arise Which Entitle The Court Or Debenture Holders To Appoint A Receiver Or A Manager, Or</p> <p>H) Shall Suffer An Execution Being Levied On His Goods And Allow It To Be Continued For A Period Of 21 Days, Or Assigns, Transfers, Sublets (Engagement Of Labour On A Piece Work Basis Or Labour With Materials Not To Be Incorporated In The Work, Shall Not Be Deemed To Be Sub-Letting) Or Attempts To Assign, Transfer Or Sub-Let The Entire Works Or Any Portion Thereof Without The Prior Written Approval Of The Commissioner; The Commissioner May, Without Prejudice To Any Other Right Or Remedy</p>
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		<p>Which Shall Have Accrued Or Shall Accrue Thereafter To The Corporation By Written Notice Cancel The Contract As A Whole Or Only Such Items Of Work In Default From The Contract.</p> <p>I) In The Case Of Abandonment Of The Work Owing To Serious Illness Or Death Of The Contractor.</p>
109.	Action When Whole Of Security Deposit Is To Be Forfeited	<p>In The Cases Mentioned In Above Clause No. 107 The Engineer, On Behalf Of The Corporation Shall Have Power To Adopt Any Of The Following Forces, As He May Deem Best Suited To The Interest Of The Corporation.</p> <p>a) To Rescind The Contract (For Which Rescission Notice In Writing To The Contractor Under The Head Of Engineer Shall Be Conclusive Evidence) And In That Case The Security Deposit Of The Contractor Shall Stand Forfeited And Be Absolutely At The Disposal Of Corporation</p> <p>b) To Carry Out Work Or Any Part Of The Departmentally Debiting The Contractor With The Cost Of The Work, Expenditure Incurred On Tools And Plan And Charges On Additional Supervisory Staff Including The Cost Of Work Charge Establishment Employed For Getting The Unexecuted Part Of The Work Completed And Crediting Him With The Value Of The Work Done Departmentally In All Respects In The Same Manner And At The Same Rates As If It Had Been Carried Out By The Contractor Under The Terms Of His Contract. The Certificate Of The Engineer As To The Costs And Other Allied Expenses So Incurred And As To The Value Of The Work So Done Departmentally And Shall Be Final And Conclusive Against The Contractor.</p> <p>c) To Order That The Work Of The Contractor Be Measured Up And To Take Such Part There Of As Shall Be On Executed Out Of His Hands, And To Give It To Another Contractor To Complete, In Which Case All Expenses Incurred On Advertisement For Fixing A New Contracting Agency, Additional Supervisory Staff Including The Cost Of Work Charge Establishment And A Cost Of Work Executed By The New Contract Agency Will Be Debited To The Contractor And The Value Of The Work Done Or Executed Through A New Contractor Shall Be Credited To The Contractor In All Respects And In The Same Manner And At The Same Rates As If It Had Been Carried Out By The Contractor Under The Terms Of This Contract. The Certificate Of The Engineer As To All The Cost Of The Work And Other Expenses Incurred As Aforesaid For Or In Getting The Unexecuted Work Done By The New Contractor And As To The Value Of The Work So Done Shall Be Final And Conclusive Against The Contractor.</p>

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		In Case The Contract Shall Be Rescinded Under Clause (A) Above The Contractor Shall Not Be Entitled To Recover Or Be Paid, Any Sum For Any Work Therefore Actually Performed By Him Under This Contract Unless And Until The Engineer Shall Have Certified In Writing The Performance Of The Such Work And The Amount Payable To Him In Respect Thereof And He Shall Only Be Entitled To Be Paid The Amount So Certified In The Event Of Either Of The Courses Referred To In Clauses (B) Or (C) Being Adopted And The Cost Of The Executed Departmentally Or Through A New Contractor And Other Allied Expenses Exceeding The Value Of The Such Work Credited To The Contractor The Amount Of Excess Shall Be Deducted From Any Money Due To The Contractor, By Corporation Under The Contractor Otherwise Howsoever Or From His Security Deposit Or The Sale Proceeds There Of Provided, However, That Contractor Shall Have No Claim Against Corporation Even If The Certified Value Of Work Done Departmentally Or Through A New Contractor Exceed The Certified Cost Of Such Work And Allied Expenses, Provided Always That Which Ever Of The Three Courses Mentioned In Clauses (A), (B) Or (C) Is Adopted By The Engineer, The Contractor Shall Have No Claim To Compensation For Any Loss Sustained By Him By Reason His Having Purchased Or Procured Any Materials, Or Entered Into Any Engagements, Or Made Any Advance On Account Of Or With A View To The Execution Of The Work Or The Performance Of The Contract.
110.	Action When The Progress Of Any Particular Portion Of The Work Is Unsatisfactory	If The Progress Of Any Particular Portion Of The Work Is Unsatisfactory The Conditions Mentioned In Clause 108(B), Be Entitled To Take Action Under Clause After Giving The Contractor 14 Days Notice In Writing. The Contractor Will Have No Claim For Compensation, For Any Loss Sustained By Him Owing To Such Action.
111.	Contractor Remains Liable To Pay Compensation If Action Not Taken Under Clause 108 And 109	In Any Case In Which Any Of The Powers Conferred Upon The Engineer By Clauses 108 & 109 Hereof Shall Have Become Exercisable And The Same Shall Not Have Been Exercised The Non Exercise There Of Shall Not Constitute A Waiver Of Any Of The Conditions Thereof And Such Powers Shall Not Withstanding The Exercisable In The Event Of Any Future Case Of Default By The Contractor For Which Under Any Clause Hereof He Is Declared Liable To Pay Compensation Amounting To The Whole Of This Security Deposit And The Liability Of The Contractor For Past And Future Compensation Shall Remain Unaffected.
112.	Power To Take Possession Of Or Require Removal Or Sell	In The Event Of Engineer Taking Action Under Sub Clauses (A) Or (C) Clause 108, He May If He So Desires, Take Possession Of All Any Tools And Plant, Materials And Store In Or Upon The Work Of The Site Thereof Or Belonging To The Contractor, Or Procured

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	Contractors Plant.	By Him And Intended To Be Uses For The Execution Of The Work Or Any Part Thereof Paying Or Allowing For The Same In Account At The Contract Rates Or In The Case Of Contract Rates Not Being Applicable At Current Market Rates To Be Certified By The Engineer Whose Certificate Thereof Shall Be Final. In The Alternative The Engineer May After Giving Notice In Writing To The Contractor Or His Clerk Of The Work Foreman Or Other Authorises Agent Requires Him To Remove Such Tools And Plant, Material, Or Stores From The Premises Within A Time To Be Specified In Such Notice And In The Event Of The Contractor Failing To Comply With Any Such Requisition, The Engineer May Remove Them At The Contractor's Expenses Or Sell Them By Auctions Or Private Sale On Account Of The Contractor And At This Risk In All Respect And The Certificate Of The Engineer As To The Expenses Of Any Such Removal And The Amount Of The Proceeds And Expensed On Any Such Sale Shall Be Final And Conclusive Against The Contractor.
113.	No Interest For Delayed Payments Due To Disputes Etc.	<p>It Is Agreed That The Corporation Of Or Its Engineer Or Officer Shall Not Be Liable To Pay Any Interest Or Damage With Respect To Any Moneys Or Balance Which May Be In Its Or Its Engineer's Or Officer's Hands Owing To Any Dispute Or Difference Or Claim Or Mis-Understanding Between The Corporation Of Or Its Engineer Or Officer On The One Hand And The Contractor On The Other, Or With Respect To Any Delay On The Part Of The Corporation Of Navi Mumabi Or Its Engineer Or Officers In Making Periodical Or Final Payments Or In Any Other Respect Whatever.</p> <p>Payment To The Contractor Of The Amount Due Under Each Of The Interim Payment Certificate Issued By The Engineer Shall Be Made By The Corporation Within 45 (Forty Five) Days If Such Certificate Being Delivered. If The Corporation Makes Late Payment, The Contractor Is To Be Paid Interest On The Late Payment In The Next Payment. Interest Shall Be Calculated From The Date By Which The Payment Should Have Been Made Upto The Date When The Late Payment Is Made At 6% Per Annum. It Is A Term Under This Contract That Payment Of Interest In Excess Of 6% Is Barred On Any Amount Payable To The Contractor On Any Account.</p> <p>It Is Distinctly Understood And Agreed Between The Parties Hereto That Payment For Work Already Executed By The Contractor Is Not A Condition Precedent Under This Contract For The Execution Of The Remaining Work.</p>
114.	Jurisdiction	In Case Of Any Claim, Dispute Or Difference Arising In Respect Of A Contract, The Cause Of Action Thereof

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		Shall Be Deemed To Have Arisen In Navi Mumbai And All Legal Proceedings In Respect Of Any Such Claim, Dispute Or Difference Shall Be Instituted In A Competent Court In The City Of Navi Mumbai Only.
115.	Finality Of Decision And Non-Arbitrability	<p>SETTLEMENT OF DISPUTES</p> <p>If A Dispute/ Disputes Of Any Kind Whatsoever Arises Between The Contractor And Engineers Representative The Same Shall Be Referred To The Engineer For His Decision With Detailed Justification. Such Reference Shall Be Stated That It Is Inpersuance To This Clause For Review And Giving Decisions By The Engineers. The Engineer Shall Give His Decision Within 14 Days Of Receipt Of Notice. If Either Party Is Not Satisfied With The Decision Of The Engineer Or The Engineer Fails To Give The Decision Within The Period Of 14 Days From The Date Of Receipt Of Notice Under This Clause, Such A Dispute May Be Referred To Arbitration As Per Clause No. 115.</p>
116.	Arbitration	<p><u>If there is no resolution of dispute after discussions between concerned HOD and the contractor the said dispute shall be referred to the commissioner of municipal corporation for the purpose of endeavoring to settle the dispute amicably. If such amicable settlement is not arrived at between the parties the disputes between the parties shall be subject to exclusive jurisdiction of court of Navi Mumbai & Thane only. It is made clear that this clause is not and arbitration clause and nothing in this clause shall be constructed to mean that Municipal commissioner will act as a arbitrator.</u></p> <p>Except Where, Otherwise Provided For In This Contract, All Questions And Disputes Relating To The Meaning Of Instruction Hear In Before Mentioned Or As To Any Other Question, Claim, Right, Matter Of Handing Whatsoever, If Any Arising Out Of Or Relating To This Contract, Specification, Estimates, Instructions, Orders Or These Conditions Or Otherwise Concerning The Works, Or The Execution Or Failure To Execute The Same Where Arising During The Progress Of The Work Or After Completion Or Abandonment Thereof Of Any Matter Directly Or Indirectly Connected With This Agreement Shall Be Referred To The Sole Arbitration Of The Municipal Commissioner Of Navi Mumbai Corporation, C.B.D., Navi Mumbai And If The Municipal Commissioner Is Unable Or Unwilling To Act As Such, Then The Matter In Dispute</p>

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		<p>Shall Be Referred To Sole Arbitration Or Such Other Person Appointed By The Municipal Commissioner Who Is Willing To Act As Such Arbitrator. In Case, The Arbitrator So Appointed Is Unable To Act For Any Reasons, The Municipal Commissioner In The Event Of Such Inability, Shall Appoint Another Person To Act As Arbitrator In Accordance With The Terms Of The Contract. Such Person Shall Be Entitled To Proceed With The Reference From The State At Which It Was Left By His Predecessors. It Is Also A Term Of This Contract That No Person Other Than A Person Appointed By The Municipal Commissioner As Aforesaid Should Act As An Arbitrator.</p> <p>As Aforesaid The Provisions Of The Arbitration And Conciliation Act 1996 Or Any Statutory Modification Or Reinactment There Of And The Rules Made There Under And For The Time Being In Force Shall Apply To The Arbitration Proceedings Under This Clause.</p>
117.	Laws Governing The Contract–	This Contract Shall Be Governed By The Indian Laws For The Time Being In Force.
PART –VII WORK COMPLETION & DEFECT LIABILITY		
118.	Clearance Of Site On Completion	Upon The Issue Of Any Taking Over Certificate The Contractor Shall Clear Away And Remove From That Part Of The Site To Which Such Taking-Over Certificate Relates All Contractor's Equipment, Surplus Materials, Rubbish And Temporary Works Of Every Kind, And Leave Such Part Of The Site And Works Clean And In A Workman Like Condition To The Satisfaction Of The Engineer. If The Contractor Does Not Clear The Site Within 15 Days All Material Will Be Confiscated And No Compensation Shall Be Paid And The Site Will Be Cleared At Risk And Cost Of The Contractor.
119.	Submissions Of Final Completion Drawings.	On Completion Of The Work, The Contractors Shall Furnish Free Of Cost 1 Set Of R.T.F. Of Final Completion Drawings And 6 Bound Sets Of Copies Of Drawings, Showing All The Details Checked And Signed By The Engineer Within 2 Months Of Completion Of Works. The Payment Of Final Bill Shall Be Made To The Contractors After Receipt Of Above Sets. In Case The Contractor Fails To Submit The Completion Drawings, A Compensation At The Rate Of Rs.5000/- Per Drawing Shall Be Recovered From The Final Bills
120.	Completion Certificate	(1) As Soon As Work Is Completed, The Contractor Shall Give Notice Of Such Completion To The Engineer

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	<p>And Within 28 (Twenty-Eight) Days Of Receipt Of Such Notice The Engineer Shall Inspect The Works And Shall Furnish The Contractor With A Certificate Of Completion Indicating (A) The Date Of Completion (B) The Defects To Be Rectified By The Contractor, And/OR (C) Items For Which Payment Shall Be Made At Reduced Rates.</p> <p>When Separate Periods Of Completion Have Been Specified For Items Or Groups Of Items, The Engineer Shall Issue Separate Completion Certificates For Such Items Or Groups Of Items. No Certificate Of Completion Shall Be Issued, Nor The Works Be Considered To Be Complete Till The Contractor Shall Have Removed From The Premises On Which The Works Has Been Executed, All Scaffolding, Sheds And Surplus Materials, Except Such As Required For Rectification Of Defects, Rubbish And All Huts And Sanitary Arrangements Required For His Workers On The Site In Connection With The Execution Of Works As Shall Have Been Erected By The Contractor Or The Workmen And Cleaned All Dirt From All Parts Of Building(S) In, Upon Or About Which The Work Has Been Executed Or Of Which He May Have Had Possession For The Purpose Of Execution Thereof And Cleaned Floors, Gutters And Drains, Eased Doors And Sashes, Oiled And Fastenings, Labeled The Keys Clearly And Handed Them Over To The Engineer Or His Representative And Made The Whole Premises Fit For Immediate Occupation Or Use To The Satisfaction Of The Engineer. If The Contractor Shall Fail To Comply With Any Of The Requirements Of This Condition As Aforesaid, On Or Before The Date Of Completion Of Works, The Engineer May At The Expense Of The Contractor Fulfill Such Requirements And Dispose Of All The Surplus Material And Rubbish Etc. As He Thinks Fit And The Contractor Shall Have No Claims In Respect Of Any Such Material Except For Any Sum Actually Realised By The Sale Thereof Less The Cost Of Fulfilling The Requirements And Any Other Amount That May Be Due From The Contractor. If The Expense Of Fulfilling Such Requirement Is More Than The Amount Realises On Such Disposal As Aforesaid, The Contractor Shall Forthwith On Demand Pay Such Excess. The Contractor`S Notice Of Completion As Aforesaid Shall Have To Accompanied With One Set Of Tracings Of Final Completion Drawings On RTF And Six Bound Sets Of Copies Of As Built Drawings, Failing Which The Notice Shall Be Deemed To Have Not Been Issued At All.</p> <p>(2) If At Any Time Before Completion Of The Entire Work, Items Or Groups Of Items For Which Separate Periods Of Completion Have Been Specified, Have Been Completed,</p>
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		<p>The Engineer With The Consent Of The Contractor Takes Possession Of Any Part Or Parts Of The Same (Any Such Part Or Parts Being Hereinafter In This Condition Referred To As "The Relevant Part") Then Not- Withstanding Anything Expressed Or Implied Elsewhere In This Contract.</p> <p>(a) Within 28days (Twenty-Eight Days) Of Date Of Completion Of Such Items Or Group Of Items Or Possession Of The Relevant Part The Engineer Shall Issue A Completion Certificate For The Relevant Part Provided The Contractor Fulfills His Obligation For The Relevant Part As In Sub-Para (1) Above</p> <p>(b) The Defects Liability Period In Respect Of Such Items And Relevant Part Shall Be Deemed To Have Commenced From The Certified Date Of Completion Of Such Items Or Relevant Part As The Case May Be.</p> <p>(c) For The Purpose Of Ascertaining Compensation For Delay Under Clause No. 88 In Respect Of Any Period During Which The Works Are Not Completed The Relevant Part Shall Be Deemed To Form A Separate Item Or Group, With Date Of Completion As Given In The Contract Or As Extended Under Clause No.80 And Actual Date Of Completion As Certified By The Engineer Under This Condition.</p> <p>(3) If Any Part Of The Work Shall Have Been Substantially Completed And Shall Have Satisfactorily Passed Any Final Test That May Be Prescribed Under The Contract, The Engineer May Issue A Certificate Of Completion In Respect Of That Part Of The Works Before Completion Of The Whole Works And Upon The Issue Of Such Certificates, The Contractors Shall Be Deemed To Have Undertaken To Complete Any Outstanding Works In That Part Of The Works During The Period Of Maintenance.</p>
121.	Taking Over Of Work	Corporation Will Take Over The Work At Any Stage Whenever Required In The Interest Of Public By Giving 10 Days Notice To The Contractor.
122.	Defects Liability Period	The Contractor Shall Be Responsible To Make Good And Remedy At His Own Expense Within Such Period As May Be Stipulated By The Engineer Any Defects Which May Develop Or Be Noticed Before The Expiry Of The Period Mentioned In The Schedule 'A' Hereto From Certified Date Of Completion And Intimation Of Which Has Been Sent To The Contractor Within 7 Days Of Expiry Of The Said Period By Letter Sent By Hand Delivery Or By Registered Post

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123.	<p>Liability For Defects Or Imperfections And Rectification Thereof</p>	<p>If It Shall Appear To The Engineer Or To His Representative At Any Time During Construction Or Reconstruction Or During The Defects, Liability Period, That Any Work Has Been Executed With Unsound, Imperfect Or Unskillful Workmanship Or That Any Material Or Article Provided By The Contractor For Execution Of Thereof The Work Is Unsound Or Of A Quality Inferior To That Contracted For, Or Otherwise, Not In Accordance With The Contract, Or That Any Defect, Shrinkage Or Other Faults Have Appeared In The Work Arising Out Of Defective Or Improper Materials Or Workmanship, The Contractor Shall, Upon Receipt Of Notice In Writing In That Behalf From The Engineer Forthwith Rectify Or Remove Or Reconstruct The Work So Specified In Whole Or Part, As The Case May Require Or, As The Case May Be, And / Or Remove The Materials Or Articles So Specified And Provide Other Proper And Suitable Materials Or Articles At His Own Expense Notwithstanding That The Same May Have Been Inadvertently Passed, Certified And Paid For, And In The Event Of His Failing To Do So Within The Period To Be Specified By The Engineer In His Notice Aforesaid The Engineer May Rectify Or Remove And Re-Execute The Work And/Or Remove And Replace With Others The Materials Or Articles Complained Of, As The Case May Be, By Other Means At The Risk And Cost Of The Contractor.</p> <p>In Case Of Repairs And Maintenance Work, Splashes And Droppings From Whitewashing, Painting Etc. Shall Be Removed And Surfaces Cleaned Simultaneously With Completion Of These Items Of Work In Individual Rooms, Quarters Or Premises Etc. Where The Work Is Done, Without Waiting For Completion Of All Other Items Of Work In The Contract. In Case The Contractor Fails To Comply With Requirement Of This Condition, The Engineer Shall Have The Right To Get The Work Done By Other Means At The Risk And Cost Of The Contractor.</p> <p>The Engineer Shall Give Three Days Notice In Writing To The Contractor Before Taking Such Action.</p> <p>The Engineer Reserves The Right To Decide The Rates And Prices Of The Works As Executed By Other Means At The Risk And Cost Of The Contractor.</p> <p>The Cost And Expenses Thereby Incurred On The Works And Also Such Penalty As The Engineer May Impose For Such Wrongful Conduct Of The Contractor (Which Penalty, The Engineer Shall Be Competent To Impose And Against The Imposition Of Which Or The Amount Thereof By The Engineer An Appeal Shall Lie Only To The Commissioner Within Seven Days Of The Order In That Behalf Of The</p>
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		Engineer And The Decisions Of The Commissioner Shall Be Final And Binding Upon The Contractor) May Be Deducted From Any Money Due Or To Become Due To The Contractor, Under This Or Any Other Contract Between The Contractor And The Corporation.
124.	Maintenance	<p>The Contractor Shall Maintain The Finished Surface Of The Road For A Period As Specified In Contract Document, After The Completion Of Work Without Any Extra Cost To Corporation Irrespective Of The Designs, Standards And Specifications And Actual Traffic Etc. The Contractor Shall Get The Potholes Filled Up With Asphalt Mix Materials And Keep The Road Surface In Good Condition Throughout The Year. 5 Percent Amount Of The Total Work Done Shall Be With Held From Running Account Bill For The Period Specified In The Contract Document From The Date Of Completion Of Work As Maintenance Charges Of Maintaining And Keeping The Road In Good Condition. This 5 Percent Amount Withheld Towards Maintenance Charges Shall Be Allowed To Be Replaced With Bank Guarantee Or Other Recognised Forms At Intermediate Stage, If So, Desired In Writing. This Maintenance Charges Shall Be In Addition To Security Deposit.</p> <p>On Completion Of The Work In All Respects, Necessary Certificates Will Be Issued By The Engineer And The Defect Liability Period Will Be Counted From The Date Of Issue Of Such Certificates</p> <p>All Damages During Execution Shall Be Made Good By The Contractor At His Cost. He Will Be Responsible For Any Damage To The Road Surface Including B.T. Surface In Rainy Season And During Construction And Guaranteed Maintenance Period And No Separate Payment Will Be Made For Resorting Such Damages.</p> <p>Defective Work Is Liable To Be Rejected At Any Stage. The Contractor On No Account Can Refuse To Rectify Defects Merely On Reasons That Further Work Has Been Carried Out. No Extra Payments Shall Be Made For Such Rectification.</p>
125.	Defects Liability Certificate	The Contract Shall Not Be Considered As Completed Until A Defects Liability Certificate Shall Have Been Signed By The Engineer And Delivered To The Contractor, Stating The Date On Which The Contractor Shall Have Completed His Obligations To Execute And Complete The Works And Remedy Any Defects Therein To The Engineer's Satisfaction. The Defects Liability Certificate Shall Be Given By The Engineer Within 28 Days After The Expiration Of The Latest Such Period, Or As Soon Thereafter As Any Works Instructed, Pursuant To Clauses 121 And Have Been Completed To The Satisfaction Of The Engineer, Provided That The Issue Of The Defects Liability Certificate Shall Not Be A Condition Precedent To Payment To The Contractor Of The Retention Money.

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126.	Unfulfilled Obligations	Notwithstanding The Issue Of The Defects Liability Certificate The Contractor And The Corporation Shall Remain Liable For The Fulfillment Of Any Obligation Incurred Under The Provisions Of The Contract Prior To The Issue Of The Defects Liability Certificate Is Issued And, For The Purposes Of Determining The Nature And Extent Of Any Such Obligation, The Contract Shall Be Deemed To Remain In Force Between The Parties To The Contract. Notwithstanding The Issue Of The Defects Liability Certificate The Contractor And The Corporation Shall Remain Liable For The Fulfillment Of Any Obligation Incurred Under The Provisions Of The Contract Prior To The Issue Of The Defects Liability Certificate Is Issued And, For The Purposes Of Determining The Nature And Extent Of Any Such Obligation, The Contract Shall Be Deemed To Remain In Force Between The Parties To The Contract.
127.	Refund Security Deposit	Of The Amount Of Security Deposit Lodged By A Contractor Shall Be Refunded Along With The Payment Of The Final Bill, Or After The Expiry Of The Defect Liability Period Which Ever Is Later Unless The Engineer Is Of The Opinion That In Order To Safeguard Against Defects And Pending Claims Against The Contractor It Is Necessary To Retain More Amount Retained As Retention Money.

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Section - V Special Conditions of Contract

1.0 GENERAL:

A systems approach may be adopted for construction of the bridge, and the Method Statement for carrying out the work, detailing all the activities including indication of time-cycle, equipment, personnel etc., shall be got approved from the Engineer before the commencement of the work. The above shall include the type, capacity and make of the batching and mixing plant.

2.0 BATCHING AND MIXING:

Batching and mixing of the concrete shall be done at a central batching and mixing plant with automatic controls, located at a suitable place which takes into account sufficient space for stockpiling of cement, aggregates and stationary water tanks. This shall be, however, situated within a distance of 30 km in Navi Mumbai area only.

3.0 EQUIPMENT FOR PROPORTIONING OF MATERIALS:

Proportioning of materials shall be done in the batching plant by weight, each type of material being weighed separately. The cement from the bulk stock may be weighed separately from the aggregates and water shall be measured by volume. Wherever properly graded aggregate of uniform quality cannot be maintained as envisaged in the mix design, the grading of aggregates shall be controlled by appropriate blending techniques.


Batching plant and equipment

General

The batching plant shall include minimum four bins, weighing hoppers, and scales for the fine aggregate and for each size of coarse aggregate. If cement is used in bulk, a separate scale for cement shall be included. The weighing hoppers shall be properly scaled and vented to preclude dust operation. Approved safety devices shall be provided and maintained for the protection of all personnel engaged in plant operation, inspection and testing. The batch plant shall be equipped with a suitable non-resettable batch counter which will correctly indicate the number of batches proportioned.

Bins and hoppers

Bins with minimum number of four adequate separate compartments shall be provided in the batching plant.

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Automatic weighing devices

Batching plant shall be equipped to proportion aggregates and bulk cement by means of automatic weighing devices using load cells.

Mixers

Mixers shall be pan type, reversible type or any other mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the specific mixing period, and of discharging the mixture, without segregation. Each stationary mixer shall be equipped with an approved timing device which will automatically lock the discharge lever when the drum has been charged and release it at the end of the mixing period. The device shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is released. In case of failure of the timing device, the mixer may be used for the balance of the day while it is being repaired, provided that each batch is mixed 90 seconds or as per the manufacturer's recommendation. The mixer shall be equipped with a suitable non-resettable batch counter which shall correctly indicate the number of batches mixed.

The mixers shall be cleaned at suitable intervals. The pickup and throw-over blades in the drum or drums shall be repaired or replaced when they are worn down 20 mm or more. The Contractor shall (1) have available at the job site a copy of the manufacturer's design, showing dimensions and arrangements of blades in reference to original height and depth, or (2) provide permanent marks on blade to show points of 20 mm wear from new conditions. Drilled holes of 5 mm diameter near each end and at midpoint of each blade are recommended. Batching Plant shall be calibrated in the beginning and thereafter at suitable interval not exceeding 1 month.

Control cabin


An air-conditioned centralized control cabin shall be provided for automatic operation of the equipment.

4.0 FIELD LABORATORY:

The Contractor shall provide field laboratory with the required laboratory equipment as per clause 121 of MORT&H Specifications

5.0 CONSULTANT APPOINTMENT:

NMMC will monitor and supervise the Project. However, NMMC shall appoint a consulting engineering firm for this purpose. The name of the finally selected such Project Management

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Consultant will be communicated to the Contractor.

Engineer: A person appointed by the Employer to act as Engineer for the purpose of contract from time to time

The Engineer shall take all decisions which have impact on the design and construction aspects of the facility with prior concurrence of the Employer. In case of any dispute on matters, including the interpretation of requirements as spelt out in this schedule, the decision of the Employer shall be final and binding.

6.0 UTILITIES

All the underground utility services such as water pipes, gas pipes, drains, sewers, cables, etc., which may be met up in or about any excavation, shall if the Engineer deem it practicable, be properly maintained and protected by the contractor by means of shoring, strutting, planking over, padding or otherwise as directed by the Engineer during the progress of the work without claiming any extra charges. Any damage to these underground utility services shall be immediately remedied by the contractor at his own cost, failing which the Engineer may with or without notice adopt such measures as he may deem necessary at the risk and cost of the contractor.

The tenderer shall contact all the public bodies, etc., to know the underground services that may be encountered by him during the execution of the work and account for the consequences of the site restraints while submitting their tenders. No compensation/cost shall be payable on account of any underground services which obstructs the work and cause delay.


7.0 SHIFTING OF UTILITY

Shifting of utility services has been included in the tender as a payable item. However, proper care shall be taken by the contractor while shifting so that these utility services are not damaged. Care shall also be taken while shifting that the nearby utility lines which need not be shifted are not damaged. Any damage to these underground utility services shall be immediately remedied by the contractor at his own cost, failing which the Engineer may with or without notice adopt such measures as he may deem necessary at the risk and cost of the contractor.

8.0 DOCUMENTATION, INSTRUMENTATION

The following items shall be deemed to be included in the tendered cost.

- a. All final drawings and Compact Discs of all approved drawings and “as built” drawings and calculations shall be supplied by the contractor free of cost.

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- b. Three Video film cassettes of 180 minute duration each of the bridge covering the different phases of construction from start to finish shall be supplied by the Contractor free of cost.


9.0 DESIGNS AND DRAWINGS

Successful bidder shall be fully responsible for getting all the necessary designs (Survey, Pavement, bridge, Structural and Hydraulic) and all working drawings for roads, SWD, Box culverts etc. and proof checking of the same from NMMC's appointed PMC at no extra cost to the Corporation. The Contractor shall be fully responsible for submission of as built drawings after completion of the work with no extra cost.

10.0 REPAIRS AND MAINTENANCE MANUAL

A "Maintenance Manual" describing access arrangements, important obligatory precautions from the point view of structural safety and procedure for minor and major repairs of each component of the bridge, renewals of finishes and treatments periodically shall be supplied by the Contractor free of cost.

- A) The following MORTH and IRC publications shall be referred for basic maintenance activities for road and bridges respectively:
 - I) MORTH Manual for Maintenance of Roads IRC – New Delhi – 1989.
 - II) IRC–SP–35-1990, Guidelines for Inspection and Maintenance of Bridges, New Delhi – 1990.
- B) The specifications for items of repairs and maintenance shall be those adopted for construction mentioned earlier and shall generally conform to latest version of manual of maintenance of roads published by I.R.C.
- C) The operation and maintenance manual shall include a maintenance and management plan for trees, shrubs, turfing and hedges to sustain their development in a manner pleasing in appearance.
- D) A "Quality Assurance Manual" covering design and drawings, mix-designs, material, testing, soil and rock properties, statistical quality control etc. shall be prepared by the Contractor free of cost well before starting the work.
- E) A "Construction Manual" covering various aspects of construction methods, difficulties faced and how they are overcome during execution etc. shall be supplied by the Contractor free of cost at the time of finalization of work.

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F) The Contractor shall install fixtures and fastenings provided by the Corporation for housing any instrumentation that may be useful for the Corporation at his cost.

11.0 Contractor shall be responsible for obtaining necessary permission/approvals from other departments like MIDC/Tree Authority. If there is delay in obtaining such approval/permissions, only time extension will be granted and no escalation shall be paid for this delayed period.

12.0 TESTS, TESTING & TRAINING REQUIREMENTS

Tests, Testing and Training Requirements as envisaged under GCC shall comprise of

1. Regular testing of materials / works as per the provisions given in the respective specifications and or the frequency laid down therein or at the frequency accepted as per International practice shall be carried out.
2. After completion test shall broadly cover Testing and Performance of the completed works shall be as per the provisions given in different IS, BIS and MORT&H standards as well related Foreign International standards.

The broad tests to be carried out are listed below:

I. Testing Road works

- (a) Road materials
- (b) Ground improvement works

II. Viaduct


A) Test of materials

- i) Testing of Cement
- ii) Testing of aggregates
- iii) Testing of concrete

- a) Tests of fresh concrete
- b) Tests on hardened concrete
- c) Flexure test

iv) Test on High performance Concrete (HPC)

- a) Tests on cement
- b) Testing of reinforcement-HYSD and Low relaxation strands

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B) Testing of Piles

- i) Initial load test for vertical load
- ii) Initial load test for horizontal
- iii) Routine load test for integrity test & Pile Dynamic test.
- iv) NDT Test at regular intervals as directed by the ER for at least 10% of total number of piles shall have to be carried out by the contractor with no cost to the employer.

C) Completed span of Super structure

D) Frequency testing requirements

- Plate load test for open foundation for each structure as per specifications.
- Piles- initial load test – 1 nos for every 200 piles
- Routine test – 2 nos per 100
- Integrity test – 100%
- Expansion joints – As per MoRT&H specifications
- Bearings – As per MoRT&H specifications
- Routine Quality Test for each structure as per specifications.

13.0 PRICE VARIATION CLAUSE (Attachment for Clause No. 106 of GCC)


Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants excluding bitumen, cement and steel in accordance with the following principles and procedures.

(a) The price adjustment shall apply for the work done from the start date given in the contract data upto end of the initial intended completion date or extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.

(b) The price adjustment shall be determined during each month from the formula given in the contract data.

(c) Following expressions and meanings are assigned to the work done during each month:

R = Total value of work done during the month. It would include the amount of secured advance granted, if any, during the month, less the amount of secured advance recovered, if any during the month. It will exclude value for works executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.

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To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.


The formula (e) for adjustment of prices are: $R = \text{Value of work}$

I- Adjustment for Labour component

- i. Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula:
- ii. $V_L = 0.85 \times P_L / 100 \times R \times (L_I - L_o) / L_o$
- iii. V_L = Increase or decrease in the cost of work during the month under consideration due to changes in rates for local labour.
- iv. L_o = the consumer price index for industrial workers for the State on 28 days preceding the date of opening of Bids as published by Labour Bureau, Ministry of Labour, Government of India.
- v. L_I = The consumer price index for industrial workers for the State for the under consideration as published by Labour Bureau, Ministry of Labour, Government of India.
- vi. P_L = Percentage of labour component of the work.

II- Adjustment for Other Material component (Excluding Bitumen, Steel and Cement).

- i. Price adjustment for increase or decrease in cost of local materials other than cement, steel, bitumen and POL procured by the contractor shall be paid in accordance with the following formula:
- ii. $V_m = 0.85 \times P_m / 100 \times R \times (M_1 - M_o) / M_o$
- iii. V_m = Increase or decrease in the cost of work during the month under consideration due to changes in rates for local materials other than cement, steel, bitumen and POL.
- iv. M_o = The all India wholesale price index (all commodities) on 28 days preceding the date of opening of Bids, as published by the Ministry of Industrial Development, Government of India, New Delhi.
- v. M_1 = The all India wholesale price index (all commodities) for the month under consideration as published by Ministry of Industrial Development, Government of India, New Delhi.

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- vi. P_m = Percentage of local material component (other than cement, steel, bitumen and POL of the work.

III- Adjustment of POL (Fuel and Lubricant) component

- Price adjustment for increase or decrease in cost of POL (fuel and lubricant) shall be paid in accordance with the following formula:
- $V_f = 0.85 \times P_L / 100 \times R \times (F_1 - F_0) / F_0$
- V_f = Increase or decrease in the cost of work during the month under consideration due to changes in rates for fuel and lubricants.
- F_0 = The official retail price of High Speed Diesel (HSD) at the existing consumer pumps of IOC at nearest centre (Thane) on the day 28 days prior to the date of opening of Bids.
- F_1 = The official retail price of HSD at the existing consumer pumps of IOC at nearest centre (Thane) for the 15th day of month of the under consideration.
- P_L = Percentage of fuel and lubricants component of the work.

Note: For the application of this clause, the price of High Speed Diesel oil has been chosen to represent fuel and lubricants group.

Star rates shall be provided for Bitumen, Cement and Steel. The difference between purchase price of contractor and the star rate shall be recoverable/ payable to/from the contractors in accordance with the following formula:

Adjustment for Cement Component

$$V_1 = Q_C \times (C_1 - C_0)$$

V_1 = Amount to be added to or deducted from IPC for changes in cost due to cement.


Q_C = Quantity of cement consumed during the period under consideration.

C_0 = Base rate of cement as stated in Table.

C_1 = Average rate of cement during the period under consideration. (This shall be the average purchase price of contractor during the period under consideration including all taxes and levies).

Adjustment for Steel Grade Fe 500 (HYSD /TMT) / HTS /Liners/ Structural steel of all grades.

$$V_2 = Q_Y \times (S_1 - S_0)$$

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V_2 = Amount to be added to or deducted from IPC for changes in cost due to steel Grade Fe 500 (HYSD /TMT) /HTS/Structural steel of all grades.

Q_Y = Quantity of steel Grade Fe 500 (HYSD /TMT) /HTS/Liners/Structural steel of all grades consumed during the period under consideration.

S_0 = Base rate of steel Grade Fe 500 (HYSD /TMT) /HTS/ Liners/Structural steel of all grades as stated in the Table.

S_1 = Average rate of Grade Fe 500 (HYSD /TMT) /HTS/ Liners/Structural steel of all grades during the period under consideration (This shall be the average purchase price of contractor during the period under consideration including all taxes and levies).

Formula for Bitumen Component (V6) -

$$V_3 = Q_B \times (B_1 - B_0)$$

V_3 = Amount to be added to or deducted from IPC for changes in cost due to Bitumen.

Q_B = Quantity of Bitumen consumed during the period under consideration.


B_0 = Base rate of Bitumen as per the Table given below.

B_1 = Official price of Bitumen of respective grade at refinery Mumbai for period under consideration. (This shall be the average purchase price of contractor during the period under consideration including all taxes and levies).

The base material shall be treated as HYSD/TMT Steel Grade Fe 500, Cement and Bitumen as stated in the Table given below. All steel bars used in work shall be treated as grade Fe. 500 for escalation payment (basic rate and current rate shall be of grade Fe. 500 only. The cost of base materials will be worked out by quantity consumed of base material related to the Interim payment Certificate x corresponding base rate given in the Table given below.

The following percentages will govern the price adjustment for the entire contract: [13.8]

Description	As Per PWD SSR
1. Labour	22.50%
2. Materials	65.00%
3. POL	12.50%
Total	100.00%
Material	Base Rate
Cement	6000/- per M.T.
Steel	
i) HYSDFE-500	61,000/- per M.T.

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ii) High Tensile Strands	74,000/- per M.T.
iii) M S Liner / Sheet piles /Structural steel all Grades	62,575/- per M.T.
iv) Bitumen VG-40 (Bulk)	52,764/- per M.T.
v) Bitumen VG-30 (Bulk)	49,862/- per M.T.
vi) Bitumen VG-10 (Bulk)	49,488/- per M.T.
vii) Bitumen Emulsion	40,000/ per M.T.
Consumer Price Index for Industrial workers for Center	Mumbai

For Extra Items Rates escalation will not be paid.


- Basic Price Indices for labour & materials component shall be on Base Date.

The following conditions shall prevail for adjustment of changes in cost.

i) The operative period of the contract shall mean the period commencing from the date of work order issued to the Contractor and ending on the date on which the time allowed for the completion of the works specified in the contract for work expires, taking into consideration the extension of time, if any, for completion of the work granted by the Engineer under the relevant clause of the Conditions of Contract in cases other than those where such extension is necessitated on account of default of the Contractor, the decision of the Engineer as regards the operative period of the contract shall be final and binding on the Contractor. Where any liquidated damages is levied on the Contractor on account of delay in completion or inadequate progress under the relevant contract provisions, the price adjustment amount for the balance of work from the date of levy of liquidated damages shall be worked out by pegging the respective indices to the levels corresponding to the date from which such liquidated damages are levied.

ii) The price variation under this clause shall not be payable for any additional (extra / excess) items required to be executed during the completion of the work.

iii) This clause is operative both ways, i.e. if the price variation as calculated above is on the plus side, payment on account of the price variation shall be allowed to the Contractor and if it is on the negative side, the Employer shall be entitled to recover the same from the Contractor and the amount shall be deductible from any amounts due and payable under the contract. To the extent that full compensation for any rise or fall in costs to the Contractor is not entirely covered by the provision of this or other clauses in the contract, the contract prices

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included in the contract shall be deemed to include amount to cover the contingency of such other actual rise or fall in costs.

Upper Limit of Price Adjustment- at the percentage below cost.

The maximum amount due to price variation will be restricted to 5% of the accepted contract value excluding the compensation payable for the materials (Bitumen, Steel and Cement)

Note: Price variation will not be payable for extension of time period beyond the project completion period.

14.0 NUMBER OF COPIES OF CONSTRUCTION DOCUMENTS

The Contractor shall supply to the Engineer or his representative printed paper copies (hard copies) of each of the Contractor's Documents. Additionally, two 'soft' copies in Acrobat PDF format and two copies in editable format should be supplied. The number of copies to be submitted shall be as mentioned in the Designs Criteria below.


15.0 PERMISSIONS AND COORDINATION WITH AUTHORITIES

The Contractor shall have to maintain liaison with the various authorities such as municipal authorities, traffic police, and revenue officials and secure the necessary clearances and permissions as may be required for carrying out the construction activities. Engineer or his representative/NMMC will provide the necessary assistance as may be required.

16.0 SITE POSSESSION SCHEDULE:

The Employer shall provide access to the Site and possession of the Right of Way for the Bridge work in stages. The Contractor has to plan the completion of activities as per availability of land in stages. The Contractor shall have to make his own arrangements for any additional or alternative land required by him for casting yard, borrow areas, quarries, site offices, crusher, batching plant, laboratory, labor camp, other camp etc. Contractor has to establish the STP at labour camp location for proper disposal of waste, which shall be removed by him after the completion of work at his own cost.

In the event of non-availability of part of land required for particular section of the Bridge, the Contractor shall carry out the work as per alternative alignment as approved by the Engineer. The reduction in scope of work as per Contract shall not entitle the Contractor for any claim towards such

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deletion. The payment towards such alteration shall be made as per the rates given in Schedule of Variation.

17.0 SETTING OUT POINTS:

The details of horizontal and vertical alignment shall be as shown in the Designs Criteria, Design Data and the Drawings.

18.0 ENVIRONMENTAL CONSTRAINTS

The Contractor shall prepare an Environmental Management Plan and get it approved from the Engineer or his representative and ensure that he adheres to the stipulations of various environmental laws and regulations in force.

19.0 PLANNING AND EXECUTION OF THE WORKS


Some part of the proposed bridge is on busy trafficked roads. The contractor therefore needs to regulate traffic and plan the work in such a fashion that minimum inconvenience is caused to the traffic. He may even have to work in restricted working hours. The contractor shall plan and schedule the construction program accordingly. The contractor should take care of all such eventualities while preparing the bid. The contractor shall ensure a minimum road width of two lanes on either side / one side as the case may be, of barricaded area for movement of vehicular traffic. The conditions mentioned above or any other such relevant condition not spelt out here shall not cause the reason for extension of contract period.

20.0 ELECTRIC POWER SUPPLY

The Contractor shall make all the necessary arrangement for procurement of electric power required for the work. The Contractor shall submit his requirement of Electric Power Supply for carrying out permanent works, operating plants and equipment's, labourers camp and field offices etc., as a part of his work plan. The employer will issue the necessary certificates, letters of recommendation etc., to the contractor for obtaining the power supply. However, the employer shall accept no responsibility for any delays in obtaining the power connections. In addition, the contractor shall maintain standby diesel generators of adequate capacity. Non-availability of electric power will not be considered as a reason for delay in progress.

21.0 WATER SUPPLY FOR CONSTRUCTION, LABOUR CAMPS, OFFICES ETC.

The Contractor shall make all necessary arrangements for the procurement of water required for construction and labour complete. The employer shall issue the necessary certificates, letters of

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recommendation etc., for obtaining the necessary permissions. The employer shall assume no responsibility for delay in progress due to delay in obtaining the permissions. The Contractor may drill bore wells as a source of construction water. The water shall be got tested by the contractor at his own expense and certificates regarding the suitability for construction shall be submitted to the Engineer regularly as per his requirements.

22.0 TELEPHONES/ WIRELESS COMMUNICATION FACILITIES

These will be arranged by contractor at his own cost. The employer shall give the necessary certificates and letters of recommendation etc., to the contractor.

23.0 LAND FOR TEMPORARY USE

Land for labour camps, storage yards temporary site sheds, Casting Yard etc., will be arranged by the contractor at his own cost. Land for batching plant, casting yard may be provided if available as per prevailing NMMC rates & policy.

24.0 CONTRACTOR'S MATERIALS, LABOUR ETC.

The Contractor shall provide everything necessary (except for items to be provided by the Employer specifically mentioned in the conditions) for the proper execution of the works according to the intent and meaning of the Drawings, Notes, and Specifications taken together, whether the same is or is not particularly shown or described therein; provided the same can be reasonably inferred therefrom. If the contractor finds any discrepancy therein he shall immediately and in writing refer the same to the Engineer. The decision of the Engineer shall be final and binding on the contractor. Figured dimensions shall be followed and the drawings shall not be scaled from.


25.0 CEMENT FOR WORKS

The Contractor shall make his own arrangement for cement. The cement shall be as per MORT&H clause 1006 for Structure by approval of Engineer. The supply of cement shall be of approved brand by the Engineer.

26.0 QUARRIES

The contractor will have to make his own arrangement of acquiring land for quarries. The contractor shall carry out all quarrying operations without endangering the environment and natural beauty of surrounding.

All excess and un-useful excavated materials shall be stacked at dumping places if available, identified by the Employer as directed by the Engineer; otherwise the contractor has to make his own

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arrangement for the same.

27.0 ENABLING WORKS

The Contractor shall supply, fix and maintain at his own cost during the execution of works, all the necessary centering, and scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, hoarding, watching and lighting by night as well as the necessary equipment for protection of public and safety of any adjacent roads/railway lines. The contractor shall remove any or all such centering scaffolding, staging planking and equipment when ordered to do so by the Engineer and make good all matters and things disturbed during the execution of works to the satisfaction of the Engineer.

28.0 TEMPORARY DIVERSIONS, MAINTENANCE OF SAME AND TRAFFIC MANAGEMENT (WHEREVER REQUIRED)


In addition to provisions made in the technical specifications, it is stipulated that the contractor shall construct, maintain and carryout the traffic management by providing all safety features like safety barricading etc. as per IRC specifications.

29.0 OPPORTUNITIES AND FACILITIES FOR OTHER CONTRACTORS AGENCIES ETC.

The contractor shall, in accordance with the requirements of the Engineer afford all reasonable opportunities for carrying out their work to any other contractors employed by the Employer and their workmen and to the workmen of the Employer and of any other duly constituted authorities who may be employed in the execution on or near the site of any work not included in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the works. If, however, the contractor shall on the written request of the Engineer or Engineer make available to any such other contractor or to the Employer or any such authority any roads or ways for the maintenance of which the contractor is responsible or permit the use of by any such of the Contractor's scaffolding or any other plant on the site or provide any other service of whatsoever nature, for any such the Employer shall pay to the Contractor in respect of such use of service such sum or sums as shall in the opinion of the Engineer be reasonable.

30.0 A. ENVIRONMENTAL CONSTRAINTS

The Contractor shall prepare an Environmental Management Plan and get it approved from the Engineer or his representative and ensure that he adheres to the stipulations of various environmental laws and regulations in force.

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The Contractor is supposed to take following mitigation measures:-

The contractor has to fulfil all the conditions as per environmental clearances attached in the Annexures, at his own cost.

a) Water Environment :-

- Wastage of water used for construction curing shall be avoided.
- The sewage generated from construction workers and staff will be treated in soak pit.
- Sedimentation of outside drains shall be avoided by using screens and silt traps.
- Proper management of channelization of water to avoid water logging at site.
- Soil excavated during bridge construction should be cleared regularly for free flow of water and ingress of salinity.
- Wherever water flow is stopped due to piling works water should be pumped ahead to maintain channelization of water to avoid water logging. Once the piling work is completed debris along bank of creek and bottom of creek must be cleared immediately.

b) Air Environment :-


- Adequate parking provision and proper traffic management for smooth traffic flow.
- Stack height of DG sets shall be as per norms of Central Pollution Control Board to allow effective dispersion of pollutants.
- Plantation of trees of various varieties on ground around project area.

c) Noise Environment :-

- Provision of proper parking arrangement, traffic management plan and smooth flow of vehicles helps to abate noise pollution due to vehicular traffic.
- It is suggested to provide Noise Barrier (with transmission loss rating 15db) as shown in drawings.

d) Biological Environment :-

- Periphery plantation of fast growing trees is recommended to act as air & noise pollution barrier during construction as well as operational phase.
- Use of covering sheets to prevent dust dispersion from vehicle use for carrying construction material at site.
- Use of covering sheets for covering construction material stored at site.

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- Vehicle having pollution under control certificate should be allowed to ply in site.
- Use of mask by workers to prevent dust.
- Sprinkling of water and fine spray from nozzles at regular intervals to suppress the dust.
- Regular health checkup for workers.
- Since animals are not sedentary, they will move to nearby areas.

30.0 B. ENVIRONMENTAL SAFEGUARDS


The Contractor shall take action of following points and note the stipulations as under as regards environmental safeguards as stipulated by the Ministry of Environment and Forests and by the SEIAA and by the local competent authority.

- Appropriate measures shall be undertaken while undertaking digging activities to avoid degradation of water quality.
- Borrow pits and other scars created during the road construction shall be properly leveled and treated.
- Adequate provision for infrastructures facilities, i.e. water supply, fuel, sanitation, etc. shall be ensured for labourers during construction period in order to avoid damage to the environment.
- No excavation from or dumping of waste materials into any water body / wetlands shall be done.
- Borrow sites for earth, quarry sites for road construction and dump site shall be identified keeping in view:
 - a. No excavation or dumping on private property is carried out without written consent of the owner.
 - b. No excavation or dumping shall be allowed or wetlands, forests areas or other ecologically valuable or sensitive locations.
 - c. The excavation work shall be done in consultation with soil conservation and watershed development agencies working in the area:
 - d. Material and other hazardous material must not be allowed to contaminate water course and the dump sites.

For such materials must be identified well in advances before construction and lined properly so that they do not leach into the ground water.

31.0 WORK ORDER BOOK

A work order book shall be maintained on the work and the Contractor of his authorised representative shall acknowledge and sign the orders given therein by the Engineer or his representative and shall comply these promptly and correctly.

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32.0 DISCOVERIES

In the event of discovery by the Contractor or his employees, during the progress of work, of any treasure, fossils materials or other articles of value or interest, the Contractor shall give immediate notice thereof to the Engineer or his representative of such treasure or things which shall be the property of the Government of India and shall not be removed by the Contractor under any circumstances.

33.0 TAXES


The rates quoted by the contractor shall be deemed to be inclusive of all the taxes excluding GST. Any further increase in Central or State Sales Tax / VAT/ Royalty or other taxes on completed items of work of this contract as may be levied and paid by the contractor shall be dealt with as per relevant provisions in the GCC.

34.0 CRITERIA FOR CONTRACTOR'S PERSONNEL

- Design Team:** The Contractor shall get the Project Designs prepared through an in house design team or outsource the designs to a specialist design consultant (the Contractor shall be solely responsible for the design of Structures). The contractor's in-house design team or the specialist design firm should have wide experience on similar projects and the dedicated team for the Project should have following personnel:


No.	Position	No. of Persons	Minimum Qualification by number of years of Experience
1	Team Leader	1	ME/M. Tech (Structures) 20 Years in Bridge/ Bridge Designs.
2	Bridge Designs Engineer or his representative (Structural Engineer)	1	ME/M. Tech(Structures) 15 Years Relevant experience.
3.	Highway Design Engineer or his representative	1	ME/M. Tech ME (Transportation) 10 Years' experience.
4.	Geotechnical Expert	1	ME/M. Tech (Geotechnical engineering) 10 Years' Experience.

- Project Management Team:** The Contractor shall possess with him a team for Project Management comprising Chief Project Manager, Project Managers, Resident Engineer or his representatives, Quality Control Engineer or his representatives, Materials Engineer or his representatives, and Safety

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Engineer or his representatives with adequate expertise and experience. The Contractor shall supply to the Engineer or his representative the details of all the Supervisory and other staffs employed by the Contractor and notify changes when made and satisfy the Engineer or his representative regarding the quality and sufficiency of the staff thus employed. The Engineer or his representative will have the unquestionable right to ask for changes in the quality and number of Contractor's Supervisory staff. The Contractor shall comply with such orders and effect replacement to the satisfaction of the Engineer or his representative. The minimum requirements in respect of the Key personnel (full time) are as follows:

Sr. No.	Position	No. of Persons	Minimum Qualification by number of years of Experience
1	Chief Project Manager	1	Graduate Civil Engineer or his representative with experience of 20 years in handling similar works/projects.
2	Project Managers/Sr. Site Engineer or his representative	1	Graduate Civil Engineer or his representative with experience of 10 years in handling similar works/projects.
3	Site Engineer or his representative (RE)	5	Graduate Civil Engineer or his representative with experience of 5 years in handling similar works/projects.
4	Bridge Engineer (RE)		Graduate Civil Engineer or his representative with experience of 5 years in handling Bridges/Bridges.
5	Site Supervisor	4	Graduate/Diploma Civil Engineer or his representative with experience of 5 years in handling similar works/projects.
6	Surveyor	1	Graduate/Diploma Civil Engineer or his representative with experience of 5 years in handling similar works/projects.
7	Quality Control Engineer or his representative	2	Graduate Civil Engineer or his representative with experience of 7 years in handling similar works/projects.
8	Materials Engineer or his representative	1	Graduate Civil Engineer or his representative with experience of 7 years in handling similar works/projects.
9	Safety Engineer or his representative	2	Graduate Civil Engineer or his representative with experience of 7 years in handling similar works/projects.

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Sr. No.	Position	No. of Persons	Minimum Qualification by number of years of Experience
10	Contract Expert	1	Graduate Civil Engineer or his representative with experience of 7 years in handling similar works/projects.
11	BIM Expert	1	Graduate Civil Engineer or his representative with experience of 5 years in handling similar works/projects.
12	Lab Technician	4	Graduate/Diploma Civil Engineer or his representative with experience of 5 years in handling similar works/projects.
13	Electrical Engineer	1	Graduate Electrical Engineer or his representative with experience of 7 years in handling similar works/projects.
14	Mechanical Engineer	1	Graduate Mechanical Engineer or his representative with experience of 7 years in handling similar works/projects.
15	Traffic Expert	1	Post Graduate Transportation Engineer or his representative with experience of 7 years in handling similar works/projects.

Contractor shall provide the list of persons authorized to sign the documents related to construction work.

35.0 PRIORITY OF DOCUMENTS

The documents forming the contract are to be taken as mutually explanatory of one another. For the purpose of interpretation, the priority of document shall be as follows

1. Notice to proceed with works (Work-Order)
2. The Contract Agreement
3. The letter of Acceptance
4. Correspondence post bid and letter of bid
5. Addendums issued by NMMC
6. Special Conditions of Contract
7. The General Conditions of Contract
8. Employer's Requirements
9. Additional Technical Specifications.
10. Technical Specifications.
11. Employer's Drawings.

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12. Completed Schedules

Other documents forming part of the Contract including contractor's technical proposal. If ambiguity or discrepancy is found Engineer shall issue necessary clarifications, instructions. The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless they agree otherwise. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The Costs of stamp duties and similar charges (if any) imposed by law in connection with entering into the Contract Agreement shall be borne by the Contractor.


36.0 AS-BUILT DRAWINGS

On the basis of all Drawings relating to the work, the Contractor, at his own expense, shall prepare. "As- Built Drawings" using the latest software AutoCAD to record the precise details of the work completed.

A copy of the AutoCAD Drawings shall be provided to the Engineer or his representative on a monthly basis for approval and to record all details relating to progress and developments. The final copy of the AutoCAD Drawings shall be provided on CD as well as 8 sets of hard copies (A1 size) at the time of issue of the Statement of Completion. Failure to provide within 60 days of completion project, the amount will be withheld as per Contract Data / Appendix to Tender.

The Contractor shall also arrange to take photographs as directed by the Engineer or his representative, depicting various details and stages of progress of works and submit them in duplicate in proper albums for records.

All detailed working drawings, design calculations and fabrication drawings for temporary works (such as form work, staging, centering, scaffolding, specialized construction, handling and launching equipment and the like) as well as bar bending schedule for reinforcement, material list for structural fabrication as well as detailed drawings for templates and anchorage and temporary support details for pre-stressing cables etc. shall be prepared by the contractor at his own cost and forwarded to the Engineer or his representative at least 2 weeks in advance of actual constructional requirements. Within one week of receipt, the Engineer or his representative will check and return one copy of the same for the contractor's use with amendments if any, marked on them after due discussion and agreement with the contractor. Such approval shall not relieve the contractor of any of his responsibilities in connection with temporary works. The contractor will supply two copies of the approved drawings for the Engineer or his representative's use. The cost of preparing all such items

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of work shall be deemed to have been included in the respective rates or price quoted by the Contractor.

37.0 COMPLIANCE WITH LAWS

The Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, such as Permission from NMMC, Traffic Police, PWD, MSETCL, MSEDCL, MIDC, RAILWAY DEPT., CIDCO, High Court, Utility Agencies, etc, licenses and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so.

38.0 INSPECTION AND AUDIT BY EMPLOYER

The contractor shall permit the Employer or the persons appointed by the Employer to inspect the site and /or the Contractors accounts and records relating to the performance of the Contract and to have such accounts audited by the Employer or the Auditors appointed by the Employer if required by the Employer.

39.0 DETAILS TO BE CONFIDENTIAL


The Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out obligations under it or as agreed with the Employer. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere except with the written consent of the Engineer and subject to such conditions as he may prescribe.

40.0 ENGINEER'S DUTIES AND AUTHORITY

The Engineer's duties and Authority will in principle comprise the following with approval of Employer:

- (i) Approving Contractor's design
- (ii) Granting claims to the Contractor
- (iii) Granting extensions of time to the Contractor
- (iv) Ordering suspension of Work
- (v) Instructing additional work and /or varying quantities of work included in the contract under clause 13 of the conditions of Contract.
- (vi) Fixing rates for additional works.

Notwithstanding anything contained in this sub-clause, it, in the opinion of the Engineer, an

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emergency occurs affecting the safety of life or of the works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer.

41.0 SITE MEETINGS

The Engineer shall summon all parties concerned to the first Site Meeting where he shall decide upon the future meetings.

It is the duty of the Contractor or his Representative to participate in the Site Meetings.

The purpose of the Site Meetings is to coordinate the various work components with the Contractor, to register the time in relation to the Program and to record agreements made.


42.0 SETTING OUT

The Contractor shall be responsible for:

- a) the accurate setting- out of the Works in relation to original points, lines and levels of reference given by the Engineer or his representative in writing,
- b) the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the Works, and
- c) the provisions of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.

If, at any time during the execution of the Works, any error appears in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required so to do by the Engineer or his representative, shall, at his own cost, rectify such error to the satisfaction of the Engineer or his representative, unless such error is based on incorrect data supplied in writing by the Engineer or his representative.

The checking of any setting- out or of any line or level by the Engineer or his representative shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench- marks, sight-rails, pegs and other materials used in setting- out the Works. In addition to above, the checking at all the setting out of the proposed works, relative to existing ground features shall be undertaken prior to the commencement of fabrication of structural steel works for substructure / foundation / superstructures etc., including providing the

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facility for the Engineer or his representative to undertake a timely check on this setting out and alerting the Engineer or his representative to any likely problems foreseen.

The Contractor shall give to the Engineer or his representative a notice not less than 48 hours in advance of his intention to set out or layout for any part of the works, so that timely assignment can be made for checking the same.

43.0 HEALTH AND SAFETY OBLIGATIONS


The Contractor shall have his own staff at the Site, an officer dealing only with issues regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for this work and shall have the Authority to issue instructions and shall take protective measures to prevent accidents. The Engineer shall have the Authority to seek deployment of a suitably qualified officer for the above position or seek replacement of the officer already deployed by the Contractor in case the Engineer considers that the officer deployed is unsuitable for this work.

HIV-AIDS Prevention – The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

44.0 WORKING METHODS

The Contractor shall submit within the time stipulated by the Engineer or his representative in writing, the details of actual methods that would be adopted by the Contractor for the execution of any item as required by the Engineer or his representative at each of the locations, supported by necessary detailed drawings and sketches including those of the equipment and machinery that would be used, their locations, arrangements for conveying and handling materials etc. and obtain prior approval of the Engineer or his representative well in advance of starting of such item of work. The Engineer or his representative reserves the right to suggest modifications or make complete changes in the methods proposed by the Contractor, whether accepted previously or not, at any stage of work with prior approval of the Employer to obtain the desired accuracy, quality, safety and progress of work which shall be binding on the Contractor and no claims on account of such change in methods of execution will be entertained by the Employer, so long as specifications of the items remains unaltered.

The Contractor shall furnish sufficient plant, equipment and labour as may be necessary to maintain

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the progress schedule. The working and shift hours for operations to be done under the supervision shall be such as may be approved by the Engineer or his representative. They shall not be varied without prior approval of the Engineer or his representative. The Contractor shall provide necessary lighting arrangements etc. for night work, as directed by the Engineer or his representative with no extra cost.

A work order book shall be maintained on the site and it shall be the property of the Employer and the Contractor shall promptly sign orders given therein by the Engineer or his representative or his authorized representatives to comply with them. The compliance shall be reported by the Contractor to the Engineer or his representative in good time so that it can be checked. The blank work order book with machine numbered pages in quadruplicate with perforated sheet for three copies to be detached will be maintained by the Engineer or his representative for this purpose. Whenever any instructions are written in the work order book, the Contractor will be supplied the first carbon copy.

45.0 USE OF SITE DATA


The Contractor shall be deemed to have obtained all necessary information as to risks, Contingencies and other circumstances which may influence or affect the Tender or Works. The Contractor shall be deemed to have inspected and examined the Site, its surroundings, the data made available by the Employer and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- a. *form and nature of the Site, including sub-surface conditions,*
- b. *hydrological and climatic conditions,*
- c. *extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,*
- d. *Laws, procedures and labour practices of the Country, and*
- e. *Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.*

The Contractor shall be responsible for his interpretation of the data without any liability there for on the Employer.

46.0 UNFORESEEABLE PHYSICAL CONDITIONS

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other

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physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give.

47.0 QUARIES

The Contractor will have to make his own arrangement of acquiring land for quarries including all necessary permissions from concern Authorities. The contractor shall carry out all quarrying operations without endangering the environment and natural beauty of surrounding.


No land shall be made available by the Employer for dumping / stacking of all excess and un- useful excavated materials and the Contractor has to make his own arrangement for the same at his cost.

48.0 MAINTENANCE OF EXISTING ROADS/FLYOVERS/BRIDGES

In case of works of improvement to the existing roads / Flyovers / Bridges, including widening of the roads / Flyovers / Bridges (subject to the amendments if any, as specified), the Contractor shall be responsible for the maintenance (Ordinary Repairs) of the complete length of the road right from the date of the work order, even though he proposes to take up the length for improvement in phases. His offer / rates shall be deemed to be inclusive of the cost of such repairs and no separate payment towards maintenance (Ordinary Repairs) would be payable to him. In case the Contractor neglects or fails to carry out maintenance to the satisfaction of the Engineer or his representative, the Engineer or his representative shall have the Authority to get the same carried out through any other agency at the risk and cost of the Contractor.

49.0 ELECTRICITY, WATER AND GAS

The Contractor shall be responsible to make his own arrangement at his own cost and to pay all charges for connections, consumptions, deposits etc., for supplies of electricity, water, gas and other services at his sites, camps, and other locations of his activities related to the Works. However, the Employer will assist the Contractor in obtaining necessary permissions from the concerned Authorities by way of recommending / certifying the requirement for the Works.

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50.0 PROGRESS SCHEDULES

- a) The Contractor shall submit the progress of work in prescribed forms and statements at periodical intervals in the form of progress charts, forms, statements and / or reports as may be approved by the Engineer or his representative.
- b) The Contractor shall maintain pro-forma, charts, and details regarding machinery, equipment, labour, materials, and periodical returns thereof as may be specified by the Engineer or his representative.

51.0 TAXATION

The Contractor and his staff shall pay all taxes, duties, levies, outgoings etc. (present as well as future) of the Government of India and the Government of the State of Maharashtra or other Competent Authorities as per the laws for the time being in force and applicable in India or in the said State in relation to the work.


Deduction of Income Tax and other taxes, if any, shall be made from each certificate of payment as per the relevant provision of the Income Tax Act or the rules framed there under and as per the prevailing Tax laws.

52.0 FOREIGN TAXATION

The Tendered Amount by the Contractor shall include all the duties and other charges (present as well as future) imposed outside the Employer's country on the production, manufacture, sale and transport of the Constructional Plant, Materials and Supplies to be used on or furnished under the Contract and on the service performed under the Contract. It shall be the exclusive responsibility of the Contractor to bear the same.

53.0 LOCAL TAXATION

The Bid is deemed to include all excise duties, custom duties, import duties, local tax (Excluding GST), Royalties, toll charges and other local direct / indirect taxes etc. that may be levied according to the laws and regulations for the time being in force, on the construction plants materials and supplies (both permanent, temporary and consumable) acquired for the purpose of the contract and on the services performed under the contract. Nothing in the contract shall relieve the Contractor from his responsibilities to pay any tax that may be levied in the Employer's country on profits made by him in respect of the contract.

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Income Tax on Staff

The Contractor's staff, personnel and labour will be liable to pay personal income taxes in the Employers country in respect of such of their salaries and wages as are chargeable under the laws and regulations in force and the Contractor shall perform such duties in regard to such laws and regulations.

54.0 RECORDS OF CONTRACTOR'S PERSONNEL AND EQUIPMENT

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer or his representative may from time to time prescribe.

The Contractor shall report to the Engineer or his representative details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer or his representative immediately by the quickest available means.

55.0 OBJECTION TO CONTRACTOR'S EMPLOYEES


If the proficiency in the English Language and capabilities required of the Contractor's key staff proves not to be acceptable, the Engineer may require the employee replaced by one acceptable to the Engineer.

56.0 MEASURES AGAINST INSECT AND PEST NUISANCE

The Contractor shall at all times take the necessary precautions to protect all staff and labour employed on the site from insect nuisance, rats and other pests and reduce the dangers to health and the general nuisance occasioned by the same. The Contractor shall provide his staff and labour with suitable prophylactics for the prevention of malaria and take steps to prevent the formation of stagnant pools of water. He shall comply with all the regulations of the local health Authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticide all buildings erected on the Site. Such treatment shall be carried out at least once a year or as instructed by the Engineer. The Contractor shall warn his staff and labour of the dangers of Bilharzia and wild animals.

57.0 FESTIVALS AND RELIGIOUS CUSTOMS

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs. The Contractor shall in all dealings with his staff and labour have due regard to all recognized festivals, days of rest and religious or other customs.

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58.0 EMPLOYMENT RECORDS OF WORKERS

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and shall be available for inspection by the Engineer during normal working hours.

59.0 LABORATORY FOR TESTING

The Contractor shall, for the purpose of testing the material, establish a field Laboratory of approximate 50 Sq.m floor area as approved by the Engineer or his representative at the Contractor's cost. The Contractor shall provide all equipment's as per list attached elsewhere in this document. Minimum 10% of testing shall be carried out at approved NABL certified Lab.


The material, for which tests cannot be carried out at the field laboratory, shall be tested at the laboratory approved by the Engineer or his representative and in presence of the Engineer or his representative.

60.0 VISIT OF CONTRACTOR DURING DEFECT LIABILITY PERIOD

The Contractor shall carry out inspection once in every 3 months during the first year after completion of the work and carry minimum 2 inspections per year for the remaining years of Defect Liability Period. The inspection shall be in the company of the representative of Engineer and representative of Employer. The defects noticed during the inspections shall be recorded and signed by the Contractor and representative of Engineer and representative of Employer. The Contractor shall rectify the defects, if any, within 15 days or such period as may be notified by the Engineer or his representative. The defect liability period shall be 5 years for Bituminous Road works / Wearing course, 10 years for Concrete Road and 20 years for All Bridge structures. Epoxy and Painting works 3years. All other Works including Electrical etc 5 years.

61.0 VARIATIONS AND ADJUSTMENTS

- 1.Extra or additional work likely to crop up is included in schedule of items (Schedule of Variation) for which applicable rates are mentioned in Schedule of Rates for Variation works in Vol - II.
- 2.Rates for all rebates arising out of deletion / reduction in scope of Design – Build & Turnkey Construction part of work shall be **100%** of the rate of extra work, when a certain item / componentis deleted / reduced.

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3.Rebate in case of deletion of any item / component in full or part which is replaced or substituted by another item / component, due to requirements of the Employer shall be 100% of the rate extra work for the item deleted partially / fully.

4.Any item not covered by schedule of variation shall be paid as extra items and for such items no escalation will be paid. The rate for such items shall be worked out based on the current Schedule of rates i.e. relevant current e-SSR, Maharashtra and in case items not available in this Schedule then TMC / NMMC / MIDC / MCGM/MJP Schedule of Rates applicable. If rates are not available, it may be paid on the basis of actual expenses to be incurred on the basis of mutually acceptable for the item by preparing Rate Analysis (RA).

5.Rates for extra works for Controlled Concrete Mixes, for which the rates are not provided in schedule of variation, shall be derived from corresponding rates the nearest designated mixes by linear interpolation.

62.0 TERMS UNDER PROVISIONAL SUMS

- a. Utility Shifting/Relocation.
- b. Any other Contingency work to main work as directed by Engineer in charge.

The rate for such items shall be worked out based on the current Schedule of rates i.e. relevant current e-SSR, Maharashtra and in case items not available in this Schedule then T M C / N M M C / M I D C / MCGM/MJP Schedule of Rates applicable, if rates are not available in above said SSR then it may be paid on the basis of actual expenses to be incurred on the basis of mutually acceptable for the item by preparing Rate Analysis (RA).


63.0 SCHEDULE OF PAYMENTS

The Schedule of Payments is annexed to these Particular Conditions (Billing Schedule in Vol. II).

In respect of Interim Payment Certificate, the 75% of the amount of Interim Payment Certificate excluding recoveries and deductions proposed by the Contractor will be paid to him on production of bills pending the scrutiny by the Engineer or his representative. The remaining balance payment will be made after certification by the Engineer or his representative and scrutiny by the NMMC.

64.0 TIME OF PAYMENTS

The amount certified in each Interim Payment Certificate as far as possible within 60 days after the Engineer receives the Statement and supporting documents; and Substitute (c) with the following:

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The amount certified in Final Payment Certificate as far as possible within **90** days after the Employer receives this Payment Certificate.

Payment of the amount due in INR shall be made by issuing a cheque in favour of the Contractor or into the bank account in India nominated by the Contractor.

65.0 CURRENCIES OF PAYMENT

The currency of account shall be the Local currency and all payments made in accordance with the contract shall be in Local Currency.


66.0 PERMISSION FROM AUTHORITY

If it is found necessary for the Contractor to move one or more loads of heavy constructional plant and equipment, materials of pre-constructed units or part of units of work over roads, highways, Flyovers on which such oversized and over-weight items are not normally allowed to be moved, the Contractor shall obtain prior permission from the relevant Authorities. Payments for complying with the requirements, if any, for protection of or strengthening of the roads, highway or Flyovers shall be made by the Contractor and such expenses shall be deemed to be included in his bid price.

67.0 URGENT REPAIRS

If, by reason of any accident, or failure, or other event occurring to or in connection with the Works, or any part thereof, either during the execution of the Works, or during the Defects Liability Period, any remedial or other work or repair shall, in the opinion of the Engineer, be urgently necessary for the safety of the Works and the Contractor is unable or unwilling at once to do such work or repair, the Employer may employ and pay any other Contractor to carry out such work or repair as the Engineer may consider necessary.

If the work or repair so done by the Employer is work which, in the opinion of the Engineer, the Contractor was liable to do at his own expense under the Contract, all expenses properly incurred by the Employer in so doing shall be recoverable from the Contractor by the Employer, or may be deducted by the Employer from any monies due or which may become due to the Contractor. Provided always that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof in writing.

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Annexure –1

FORM OF BANK GUARANTEE BOND

In Consideration Of The Navi Mumbai Municipal Corporation (Hereinafter Called 'The NMMC') Having Agreed To Exempt _____ (Hereinafter Called "The Said Contractor(S)') From The Demand Under The Terms And Conditions Of An Agreement Dated _____ Made Between _____ And _____ For _____ (Hereinafter Called "The Said Agreement Of Security Deposit For The Due Fulfillment By The Said Contractor (S) Of The Terms And Conditions Contained In The Said Agreement, On Production Of A Bank Guarantee For Rs. _____ (Rupees _____ Only) We, _____ (Hereinafter Referred To As 'The Bank') At The Request

(Indicate The Name Of The Bank)

Of _____ [(Contractor (S) Do Hereby Undertake To Pay The NMMC An Amount Not Exceeding Rs. _____ Against Any Loss Or Demand Caused To Or Suffered Or Would Be Caused To Or Suffered By The NMMC By Reason Of Any Branch By The Said Contractor (S) Of Any Of The Terms Or Conditions Contained In The Said Agreement.

2. We _____ Do Hereby Undertake To Pay The
(Indicate the Name of the Bank)

Amounts Due And Payable Under This Guarantee Without Any Demur, Merely On A Demand From The NMMC Stating That The Amount Claimed Is Due By Way Of Loss Or Damage Caused To Or Would Be Caused To Or Suffered By The NMMC By Reason Of Breach By The Said Contractor (S) Of Any Of The Terms Or Conditions Contained In The Said Agreement Or By Reasons Of The Contractor (S) Failure To Perform The Said Agreement . Any Such Demand Made On The Bank Shall Be Conclusive As Regards The Amount Due And Payable By The Bank Under This Guarantee. However, Our Liability Under This Guarantee Shall Be Restricted To An Amount Not Exceeding Rs.

3. We, Undertake To Pay To The NMMC Any Money So Demanded Not With Standing Any Dispute Or Disputes Raised By The Contractor (S) / Supplier (S) In Any Suit Or Proceeding Pending Before Any Court Or Tribunal Relating Thereto Our Liability Under This Present Being Absolute And Unequivocal.


The Payment So Made By Us Under This Bond Shall Be A Valid Discharge Of Our Liability For Payment There Under And The Contractor (S) / Supplier (S) Shall Have No Claim Against Us For Making Such Payment.

4. We, _____ Further Agree That The Guarantee Herein
(Indicate The Name Of Bank)

Contained Shall Remain In Full Force And Effect During The Period That Would Be Taken For The Performance Of The Said Agreement And That It Shall Continue To Be Enforceable Till All The Dues Of The NMMC Under Or By Virtue Of The Said Agreement Have Been Fully Paid And Its Claims Satisfied Or Discharged Or Till The City Engineer Of NMMC (Indicate The Name Of Administrative Department) Certifies That The Terms And Conditions Of The Said Agreement Have Been Fully And Properly Carried Out By The Said Contractor (S) And Accordingly Of The Said Agreement Have Been Fully And Properly Carried Out By The Said Contractor (S) And Accordingly Discharges This Guarantee. Unless A Demand Or Claim Under This Guarantee Is Made On Us In Writing On Or Before The We Shall Be Discharged From All Liability Under This Guarantee Thereafter.

5. We Further Agree With The NMMC That
(Indicate The Name Of Bank)

The NMMC Shall Have The Fullest Liberty Without Our Consent And Without Affecting In Any Manner Our Obligations Hereunder To Vary Any Of The Terms And Conditions Of The Said Agreement Or To Extend Time To Performance By The Said Contractor (S) From Time To Time Or To Postpone For Any Time Or From Time To Time Any Of The Powers Exercisable By The NMMC Against The Said Contractor (S) And To Forbear Or Enforce Any Of The Terms And Conditions Relating To The Said Agreement And We Shall Not Be Relieved From Our Liability By Reason Of Any Such Variation, Or

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Extension Being Granted To The Said Contractor (S) Or For Any Forbearance, Act Or Commission On The Part Of The NMMC Or Any Indulgence By The NMMC To The Said Contractor (S) Or By Any Such Matter Or Thing Whatsoever Which Under The Law Relating To Sureties Would But For This Provision, Have Effect Of So Relieving Us.

6. This Guarantee Will Not Be Discharged Due To The Change In The Constitution Of The Bank Or The Contractor (S) / Supplier (S).

7. We, Lastly Undertake Not To Revoke This


(Indicate The Name Of Bank)

Guarantee During Its Currency Except With The Previous Consent Of The NMMC In Writing.

Dated The Day Of20

For

(Indicate The Name Of Bank)

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Annexure –2
UNDERTAKING
(On A Rs. 500/- Stamp Paper)

The Information / Documents Submitted by Us Are True to Our Knowledge And If The Information / Documents So Furnished Shall Be Found To Be Untrue Or False, The Tender Shall Be Liable To Be Disqualified And Our Earnest Money Accompanying Tender Will Be Forfeited.

Also, I/We Aware That If the Information / Document Found to Be Untrue Or False During The Currency Of Contract, Our Contract Liable To Be Terminated.

..... I / We Hereby Declare That I / We Have Made Myself / Ourselves Thoroughly Conversant with The Sub-Soil Conditions Regarding All Materials (Such as Stone, Murum, Sand, Etc.) and Labour of Which I / We Have Based My / Our Rates for This Work. The Specifications, Conditions Bore Results and Lead of Materials on This Work Have Been Carefully Studied and Understood By Me / Us Before Submitting This Tender. I / We Undertake to Use Only the Best Materials Approved by The City Engineer, N.M.M.C. Or His Duly Authorized Assistant, Before Starting the Work and To Abide by His Decision.

I/ We Agree That The Amount Of Earnest Money Shall Not Bear Interest And Shall Be Liable To Be Forfeited To The Corporation, Should I/We Fail To (I) Abide By The Stipulation To Keep The Offer Open For The Period Of 120 Days From The Date Fixed For Opening The Same And Thereafter Until It Is Withdrawn By Me/ Us By Notice In Writing Duly Addressed To The Authority Opening The Tenders. (Ii) Security Deposit as Specified in Schedule 'A' And Within the Time Limit Laid Down In 24 Of Detailed Tender Notice. The Amount of Earnest Money May Be Adjusted Towards the Security Deposit or Refunded To Me /Us If So Desired By Me/Us In Writing, Unless The Same Or Any Part Thereof Has Been Forfeit As Aforesaid.

Should This Tender Be Accepted I/ We Hereby Agree To Abide By And Fulfill All The Terms And Provisions Of The Conditions Of Contract Annexed Hereto So Far As Applicable And In Default Thereof To Forfeited And Pay To NMMC The Sums Of Money Mentioned In The Said Conditions.

On line payment receipt No.....Dated From The Nationalized/ Scheduled Bank At..... In Respect of The Sum Of *Rs..... Is Herewith Forwarded Representing the Earnest Money (A) The Full Value of Which Is To Be Absolutely Forfeited To N.M.M.C. Should I/ We Not Deposit The Full Amount Of Security Deposit Specified In The Detailed Tender Notice.

Tenderer


Address
.....

Date The Day Of 20

Signature Of Tenderer

(Witness) **Signature Of Witness**

Address


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Annexure –3 Firm Details

1.	Name Of Firm And Class Of Registration With Validity Date & Value Of Registration		
2.	Address For Communication & Telephone No. E - Mail		
3.	Details Of Proprietor/Partners/Director		
	Name	Address	Qualification And Experience
4.	Annual Turnover Previous Financial Year (Y-1) 2 nd Previous Financial Year (Y-2) 3 rd Previous Financial Year (Y-3) 4 th Previous Financial Year (Y-4) 5 th Previous Financial Year (Y-5)		Certified Copy of Audited Balance Sheet Profit / Loss Statement Attested (Yes/No.)
5.	Details Of Blacklisted & Litigation		
6.	Remarks		

Signature Of Proprietor or Authorized Person Of The Firm

Note: - The Turnover Amount Should Be Certified And Audited By CA Of Firm And Separate Sheet Should Be Enclosed

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Annexure –4

Details Of Works Of Similar Type And Magnitude Carried Out By The Tenderer (Last 5 Years)

Name Of The Tenderer:

Sr. No.	Name Of Work	Type Of Work	Name Of Department & Address	Cost Of Work	Date Of Starting	Stipulated Date Of Completion	Actual Date Of Completion	Remarks
1	2	3	4	5	6	7	8	9
1)								
2)								
3)								


Note: - The Completion certificates issued by the client rank not below Executive Engineer should be submitted.

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Annexure –5

List Of Work In Hand As On The Date Of Submission Of This Tender


Sr. No.	Name Of Work	Name Of Dept. & Address	Work In Hand		Anticipated Date Of Completion	Remark
			Tender Cost	Cost Of Remaining Work		
1.	2.	3.	4.	5.	6.	7.

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Annexure –6

List Of Works Tendered As On The Date Of Submission Of This Tender

Sr. No.	Name Of Work	Name Of Dept. & Address	Works Tendered For			Remark
			Estimated Cost	Date When Decisions Expected	Stipulated Date Of Period Of Completion	
1.	2.	3.	4.	5.	6.	7.


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Annexure –7

List Of Relevant Plant And Machinery along with ownership documents

Sr. No.	Name Of Equipment	No. Of Units	Kind And Make	Capacity	Age & Conditions	Present Location	Remarks
1	2	3	4	5	6	7	8
A)	Immediately Available						
B)	Proposed To Be Procured For The Work.						

Note: Purchase order/ Ownership document shall be submitted

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Annexure – 8

Details of Technical Personnel Available With the Contractor

Name of the Tenderer:

Sr. No.	Name Of Work	Technical Qualification	Whether Working In Field Or In Office	Experience Of Execution Of Similar Works	Period For Which The Person Is Working With The Tenderer	Remarks
1	2	3	4	5	6	7

Note : Technical Qualification Certificates from recognized institutes / Universities shall be submitted

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Annexure – 9

AFFIDAVIT ON STAMP PAPER OF VALUE OF RS. 500/-

I/We Hereby State That We Are Aware of The Provisions Of Section 10(1) 10(F) & (G) Of The MMC Act. 1949 Which Is Reproduced Below, And Solemnly State That We Have No Partnership Or Any Share Of The Any Corporator Of Any Corporation In Our Company And Are Not Associated Presently Or In The Past With Any Of The Office Bearers Of The Navi Mumbai Corporation Either Directly Or Indirectly.
Extract Of Sec 10 Of MMC Act 1949.

10 (E) Subject to The Provision of Section 13 And 404, A Person Shall Be Disqualified For Being Elected And For Being A Counciller.

10 (F) Subject to The Provisions Sub-Section (2) Has Directly, By Himself or His Partner Any Share Or Interest In Any Contract Or Employment With By Or On Behalf Of The Corporation.”

10(G) “Having Been Elected A Councilor Is Retained Or Employed In Any Professional Capacity In Connection With Any Cause Of Proceeding In Which By Or On Behalf Of The Corporation.”

We Are Aware That the Above Information If Found to Be Untrue or False, We Are Liable to Be Disqualified And The Earnest Money Accompanying The Tender Shall Stand Forfeited To The Corporation. We Are Also Aware That If the Information Produced Above If Found to Be Untrue Or False During The Currency Of The Contract. We Shall Be Held to Default and The Contract, If Any Awarded To Us, Shall Be Liable To Be Terminated With All Its Concurrences.

Tenderer

Address

.....

Date The Day Of 20

Signature Of Tenderer


Witness

Address

.....

Occupation

Signature Of Witness

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Annexure - 10

(Affidavit on Rs.100/- Stamp Paper)

I.....age.....address.....(Authorized signatory to sign the contract), hereby submit, vide this affidavit in truth, that I am the owner of the contracting firm / authorized signatory and I am submitting the document in envelope no.1 for the purpose of scrutiny of the contract of work name ----- . I hereby agree to the conditions mentioned below :-

1. I am liable for action under Indian Penal Code for submission of any false/ fraudulent paper / information submitted in envelope no.1.
2. I am liable for action under Indian Penal Code if during contract period and defect liability period, any false information, false bill of purchases supporting proof of purchase, proof of testing submitted by my staff, subletting company or by myself, I will be liable for action under Indian Penal Code.
3. I am liable for action under Indian Penal Code if any paper is found false / fraudulent during contract period and even after the completion of contract (finalization of final bill).

(Signature of contract)
(seal of company)

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Annexure - 11

INDEMNITY BOND

ON STAMP PAPER OF VALUE OF RS. 500/-

In consideration of Navi Mumbai Municipal Corporation incorporated under MMC act 1949 and having its office at plot no 1., Palm Beach Junction Sector 15A, C.B.D. Belapur, Navi Mumbai-400614. (hereinafter referred to as the Corporation, which expression, shall unless it be repugnant to the context or meaning thereof includes its successors or assigns) having awarded to M/s. _____

_____ a Partnership/Proprietorship/Pvt. Ltd./Ltd. firm carrying in such name and style the business of construction (hereinafter referred to as the Contractor which expression shall, unless it be repugnant to the context or meaning thereof, includes its partners or Partner/Proprietor for the time being or its surviving Partner or his heirs and executors) for the work of _____

_____ at an _____ percent above / below estimated cost of Rs. _____ and in compliance with one of the terms and conditions of the said Contract.


We, M/s. _____ being the Contractor do hereby agree and undertake and indemnify and save harmless the Corporation in consequence of the manufacturing defect, patent manufacturing defect and construction defect found in the constructed work at any time in a defect liability period of _____ years with the grant of completion certificate by the Corporation to the Contractor in accordance with and subject to the provision of the said contract.

It is hereby agreed and declared that the City Engineer of the Corporation or any officer acting as such City Engineer of the Corporation shall be the Competent Authority to decide upon the question as to the defects in the construction of works and the remedy to be applied by the Contractor for their rectification at his cost and his decision shall be final, conclusive and binding upon both the Corporation and the Contractor, provided that the City Engineer shall so decide after giving an opportunity to the Contractor to represent his case.

We hereby agree and undertake irrevocable and unconditionally to carry out duly each and every decision, order, direction or instruction as may be issued by the said City Engineer or as the case may be, the officer of the Corporation in his behalf and to rectify properly and promptly the defect found by him.

Bidder

NMMC

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=====

FOR AND ON BEHALF OF M/S. _____

Place: - _____

Date: - _____

S E A L

Notary, Maharashtra State

BEFORE ME

Notary,


Maharashtra State

Noted and Registered at _____

Serial Number _____

For & on Behalf of Corporation

Accepted By

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(ON LETTER HEAD OF FIRM/AGENCY)

(Details of Litigation/Blacklist History)

(with all supporting documents)

Seal & Signature of Proprietor or Authorised Person of the firm

Annexure - 12

**Minutes of the 159th (Day 4) meeting of Maharashtra Coastal Zone
Management Authority (MCZMA) held on 28th June, 2022**

All concern local bodies of coastal districts while submitting the proposals shall take into consideration the following guidelines:

Guidelines:

- 1) Proposals wherein there is pure renovation /repair / minor addition & alteration of existing authorized structure which has necessary approvals from all competent authorities or existing old authorized structures existing prior to 19.02.1991, without increase in FSI, then local body can take decision as per MCZMA circular no. MCZMA/2017/CR 28/TC 4 dated 27.04.2017. No need of MCZMA recommendation for such miscellaneous proposals.
- 2) Proposals wherein new construction on vacant plot OR reconstruction of existing authorized structure is done without prior approval from the competent Authority such cases, will require examination as per Office Memorandum (OM) dated 19th Feb, 2021 issued by MoEF, New Delhi. However, applicability of said OM issued by MoEF, New Delhi is subject to outcome of ongoing High Court matter wherein said OM is challenged and currently stayed.
- 3) The para 6(d) of the CRZ Notification, 2011 stipulates the provision of regularization of dwelling units of the traditional coastal communities including fisherfolk, tribals as were permissible under the provisions of the CRZ notification, 1991, but which have not obtained formal approval from concerned authorities under the aforesaid notification, subject to certain conditions stipulated therein.
- 4) Proposals wherein construction on vacant land or reconstruction of existing authorized structure is proposed, such matters will be examined as per current applicable CRZ Notification, 2011 and approved CZMP, 2011 thereunder. Once the CRZ Notification, 2019 come into effect, the proposals would be examined as per provisions of the CRZ Notification, 2019.

The Authority opined that the above guidelines to be communicated to local bodies of all 7 coastal districts.

Item No. 41: Proposed development of RCC Bridge from Ghansoli to Airoli by Navi Mumbai Municipal Corporation (NMMC).

The Authority noted that the proposal is for development of RCC Bridge from Ghansoli to Airoli by Navi Mumbai Municipal Corporation (NMMC). It involves construction of segmental bridge over length of 3.05 km with 6 lane divided carriageway. It further merges into proposed four Lane Bridge ending

**Minutes of the 159th (Day 4) meeting of Maharashtra Coastal Zone
Management Authority (MCZMA) held on 28th June, 2022**

at chainage 3+050 connecting existing road near sector 14 of Airoli. The road on embankment continues into 6 lane bridge and ends at chainage 2+850 connecting Mulund-Airoli bridge with required interchanges. The project involves construction of bridge in mangrove area along east bank of Thane creek over length of 1.05 km.

As per approved CZMP, the project falls in CRZ -I (A) & II areas. The project involves construction of bridge in mangrove area along east bank of Thane creek over length of 1.05 km. As per approved CZMP, the project falls in CRZ -I (A) & II areas. The PP has submitted the Rapid EIA / EMP for the project. The PP presented that appropriate measure are planned in order to minimize the impact of the project on marine ecology, mangrove and flamingos in the airoli creek.

The proposal was earlier deliberated in 152nd, 154th and 158th meeting of MCZMA held on 16.02.2021, 15.04.2021 and 25.5.2022 respectively.

As per the decision of the MCZMA in the said meetings, reports were received from the NMMC and Mangroves Cell.

1) NMMC Report:-

The NMMC vide letter dated 17.2.2021 submitted its report. The report states as follows:

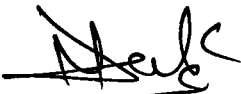
Temporary impact: The total 15 m of ROW will be required for construction purpose. Mangroves under this are will be affected temporarily. Permanent Impact: There will be 25 nos of piers for which the mangrove will be affected permanently.

	Mangrove area (Sqm)	Nos of mangrove
Temporary impact	10,125	2640
Permanent Impact	2025	810
Total	12150	3540

- a) The embankment was a part of CIDCO development for sector 10A of Airoli or peripheral road. It is understood that this was done 20 years back.

2) Mangrove Cell Report:

The Mangrove cell vide letter dated 26.03.2021 submitted its report. As per the report, the site visit was done at proposed site on 08.03.2021 & following observation was made during the site visit.


Member Secretary


Chairperson

Minutes of the 159th (Day 4) meeting of Maharashtra Coastal Zone Management Authority (MCZMA) held on 28th June, 2022

- 1) The proposed bridge is constructed from Ghansoli sector 14 to sector 10 A and the GPS regarding are.
 - 19 07 32.63N 72 59 20.88E (Ghansoli)
 - 19 09 3.16N 72 59 11.93E (Airoli)
- 2) The proposed bridge is passing through Reserve Forest (Mangrove) villages Dive survey no. 150A, Talvali survey no. 195, Navi Mumbai survey no. 184 and Ghansoli survey no. 109. Approximately 4ha. forest area will be affected due to the proposed project.
 - Total number of mangroves affected will be approximately 5,500 to 6000 trees which fall in the alignment of the proposed bridge. However, approximately 1000 mangroves will be cut for the purpose of construction of piers (25 numbers).
 - Part of bridge and embankment is passing through 50m buffer zone of Reserve mangrove forest (Dive village S. N. 150A)
 - As the proposed project is an important public infra project to improve connectivity in Navi Mumbai region, it is recommended by the mangrove cell on the condition that PP has to obtain necessary permission under FCA 1980 and also from the Hon'ble High Court.

The Authority in the earlier meetings noted that as per the report of the mangrove cell, total number of mangroves affected will be approximately 5,500 to 6000 trees which fall in the alignment of the proposed bridge. However, approximately 1000 mangroves will be cut for the purpose of construction of piers. Taking into the order dated 18th Sep, 2018 in PIL 87/2006 by Hon'ble High Court, which bars the construction in mangroves area except in public interest project, the Authority after deliberation decided that NMMC need to submit the explicit note on the public interest involved in the project to the MCZMA. Accordingly, the matter was deferred for the want of above said information from the NMMC. Accordingly, the NMMC vide letter dated 15.04.2021 submitted a note. Further, following the decision of the MCZMA in its 158th meeting, the NMMC vide letter dated 13.6.2022 submitted the mangrove plantation plan.

The Authority discussed that the PP should make active efforts to minimize impact on mangroves in order to have lesser temporary loss of mangroves during construction phase of the activity. Mangroves cutting should be restricted to bare minimum. Spacing between pillars of bridge should be designed in such a way that it will have minimum footprint in the mangroves area. Adequate Culverts/ channels should be provided at appropriate locations while constructing approach road so as to ensure the free movement of the tidal water in the mangrove vegetation.

**Minutes of the 159th (Day 4) meeting of Maharashtra Coastal Zone
Management Authority (MCZMA) held on 28th June, 2022**

The Authority noted that as per para 8.I. CRZ I (ii) (g) of the CRZ Notification, 2011, construction of roads on stilts or pillars without affecting the tidal flow of water is a permissible activity.

Further, as per amended CRZ Notification dated 28th November, 2014 published by MoEF, For the projects specified under 4(i)(except with respect to item (d) thereof relating to building projects with less than 20,000 sqm of built up area) and for the projects not attracting EIA Notification, 2006, clearance from SEIAA is required based on the recommendation from MCZMA.

In the light of above, the Authority after detailed discussion and deliberation decided to recommend the proposal to SEIAA subject to strict compliance of following conditions:

1. The proposed Ghansoli to Airoli Bridge should be carried out strictly as per the provisions of CRZ Notification, 2011 as amended from time to time and with a commitment of protection and conservation of coastal environment.
2. PP should strictly ensure that mangroves cutting should be restricted to bare minimum. Spacing between pillars of bridge should be designed in such a way that it will have minimum footprint in the mangroves area. Adequate Culverts/ channels should be provided at appropriate locations while constructing approach road so as to ensure the free movement of the tidal water in the mangrove vegetation
3. PP should make active efforts to minimize impact on mangroves in order to have lesser temporary loss of mangroves during construction phase of the activity.
4. PP to obtain the prior High Court permission since, the project involve cutting of the mangroves.
5. PP to obtain the Forest clearance under Forest (Conservation) Act, 1980.
6. PP to obtain the NoC from the mangrove cell. Compensatory afforestation of the mangroves should be carried out with the help of the Forest Department.
7. Construction debris and dredged material should not be disposed of in the mangrove area & creek water to avoid any adverse impact on mangroves and marine water quality.
8. Debris generated during the project activity should not be dumped in CRZ area. It should be processed scientifically at a designated place.
9. PP to ensure that best industrial practices should be followed for fire safety measures and for conservation of coastal environment


Member Secretary


Chairperson

**Minutes of the 159th (Day 4) meeting of Maharashtra Coastal Zone
Management Authority (MCZMA) held on 28th June, 2022**

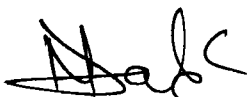
10. PP to install the Sewage Treatment plant (STP) for the treatment of the waste water treatment.
11. Project proponent should implement Mitigation measures and Environment Management plan as stipulated in the EIA report, effectively and efficiently in letter and spirit during construction and operational phase of the project to ensure that coastal environment is protected.
12. All other required permissions from different statutory authorities should be obtained prior to commencement of work.

-----Meeting ended with vote of thanks to chair-----

Annexure I

List of members/officials present in the online meeting:

1. Commissioner, Fisheries, Member, MCZMA
2. Mr. P. K. Mirashe, Representative from the Industry Dept, Member MCZMA
3. Dr. Mahesh Shindikar, College of Engineering, Pune, Expert Member, MCZMA
4. Dr. A. K. Chaubey, Ex Regional Director NIO, Expert Member, MCZMA
5. Mr. Sunil Bhat, DYChE, MCGM, Representative from the MCZMA, Member, MCZMA
6. Mr. Narendra Toke, Director, Environment &CC and Member Secretary, MCZMA.


Member Secretary


Chairperson

Annexure - 13



भारतसरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS
& CLIMATE CHANGE

Integrated Regional Office
Ground Floor, East Wing
New Secretariat Building
Civil Lines, Nagpur - 440001
apccfcetral-ngp-mef@gov.in

F.No. FC-I/MH-260/2022-NGP /10618

Date: 22.11.2022

To,

The Principal Secretary (Forests),
Revenue and Forest Department,
Hutatma Rajguru Chowk
Madam Cama Marg
Mantralaya, Mumbai - 400032.

Sub: Diversion of 4.0122 ha Reserved Forest and Un-notified Mangrove Forest in favour of Navi Mumbai Municipal Corporation for construction of proposed Ghansoli to Airoli Creek Bridge at Villages- Ghansoli, Talavali & Dive, Taluka- Navi Mumbai, District- Thane in the State of Maharashtra- regarding.

Sir,

The undersigned is directed to refer to The APCCF & Nodal Officer (FCA), Maharashtra letter no. Desk-17/Nodal/Mangrove Cell/I.D-12925 (73)/2638/2021-22 dated 08.03.2022 on the above subject seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980 and letter no. Desk-17/Nodal/Mangrove/I.D-12925/549/2022-23 dated 07.06.2022 and letter no. Desk-17/Nodal/Thane/ID-12925/1874/2022-23 dated 20.10.2022 forwarding additional information as sought vide this office letter of even number dated 31.03.2022 and 26.08.2022 and to say that the said proposal has been examined in the Integrated Regional Office in light of the relevant provisions of the Forest (Conservation) Act, 1980 and Guidelines issued thereunder.

After careful examination of the proposal and on the basis of the recommendation of State Government, Maharashtra, the Central Government hereby accords 'in-principle' approval under Section- 2 of the Forest (Conservation) Act, 1980 for diversion of 4.0122 ha Reserved Forest and Un-notified Mangrove Forest in favour of Navi Mumbai Municipal Corporation for construction of proposed Ghansoli to Airoli Creek Bridge at Villages- Ghansoli, Talavali & Dive, Taluka- Navi Mumbai, District- Thane in the State of Maharashtra subject to the fulfilment of the following conditions:

- i. Legal status of the forest land shall remain unchanged;
- ii. Forest land will be handed over only after required non-forest land for raising CA is handed over by the User Agency;
- iii. **Compensatory afforestation**
 - a) Compensatory afforestation shall be taken up by the Forest Department over 4.0122 ha non-forest land in Sur. No. 96/21 at Village- Saravali, Taluka- Dahanu, District- Palghar at the cost of the User Agency. As far as possible, a mixture of local indigenous species along with 10% RET species of Palghar District shall be planted and monoculture of any species may be avoided. Atleast one water body shall be constructed in the form of tank/ stop dams etc if the same are not available in the area or in nearby vicinity. Further, if existing tanks/ stop dams are available and needs desilting/ repair; same shall be carried out to meet the water requirement of wild animals throughout the year;
 - b) The non-forest land proposed for CA shall be transferred and mutated in the name of Forest Department and notified as RF/PF prior to Stage-II approval. A copy of the original notification declaring the non-forest land under Section 4 or Section 29 of the Indian Forest Act, 1927, or under the relevant section of the State Forest Act as the case may be, will be submitted by the State Government prior to Stage-II approval;


- iv. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars if required on the CA land shall be deposited in advance with the Forest Department by the project authority. The CA will be maintained for 10 years. The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years;
- v. **NPV:**
- a) The State Government shall charge the Net Present Value (NPV) for the 4.0122 ha forest area to be diverted under this proposal from the User Agency as per the orders of the Hon'ble Supreme Court of India dated 30/10/2002, 01/08/2003, 28/03/2008, 24/04/2008 and 09/05/2008 in IA No. 566 in WP (C) No. 202/1995 and as per the guidelines issued by the Ministry vide letters No. 5-1/1998-FC (Pt.II) dated 18/09/2003, letter No. 5-2/2006-FC dated 03/10/2006, letter No. 5-3/2007-FC dated 05/02/2009, letter No. 5-3/2011-FC(Vol-I) dated 06.01.2022 and letter No. 5-3/2011-FC(Vol-I) dated 22.03.2022 in this regard;
- b) Additional amount of the NPV of the diverted forest land, if any, becoming due after finalization of the same by the Hon'ble Supreme Court of India on receipt of the report from the Expert Committee, shall be charged by the State Government from the User Agency. The User Agency shall furnish an undertaking to this effect;
- vi. User agency shall restrict the felling of trees to minimum number in the diverted forest land and the trees shall be felled under the strict supervision of the State Forest Department and the cost of felling of trees shall be deposited by the User Agency with the State Forest Department;
- vii. All the funds received from the user agency under the project shall be transferred/ deposited to CAMPA fund only through **e-portal** (<https://parivesh.nic.in/>);
- viii. The State Government, Maharashtra/ Nodal Officer (FCA), Maharashtra shall ensure settlement of rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (No. 2 of 2007) before issuing an order for handing over of forest land to the User Agency as per Rule- 9 (6) (b) (ii) of Forest (Conservation) Rules, 2022 dated 28.06.2022;
- ix. As per recommendation of PCCF, Wildlife, User Agency shall carry out bird survey at every 6 monthly interval in consultation with APCCF, Mangrove Cell, Mumbai and all recommendation based on the observations made in bird survey shall be implemented by the User Agency or by the State Government at the cost of User Agency. A copy of the bird surveys carried out by the User Agency shall be submitted along with Stage- I compliance report;
- x. To improve the Forest/ Tree cover and to reduce pollution in the State, as mandated in National Forest Policy, 1988 and Environmental (Protection) Act, 1986 respectively, the User Agency with involvement of Joint Forest Management Committees (JFMC's) and in consultation with local DCF shall raise at least 5,000 seedlings of forestry species along with bamboo, fruit bearing, medicinal, ornamental and indigenous/local for 10 years. At least 50% of seedlings shall be planted in the vicinity of project area and remaining 50% of seedlings shall be distributed among villagers as per choice of villagers. The concerned JFMC's shall maintain record of plantation/ seedling distribution to villagers;
- xi. User Agency shall strictly adhere to the conditions mentioned by Thane Creek Flamingo Sanctuary Eco Sensitive Zone Monitoring Committee meeting held on 05.04.2022 and Maharashtra Coastal Zone Management Authority meeting held on 28.06.2022;
- xii. User Agency shall obtain CRZ clearance before commencement of the project and copy of the same shall be submitted along with Stage- I compliance report;
- xiii. Speed regulating signage will be erected along the road at regular intervals in the Protected Areas/ Forest Areas;

- xiv. The State Government/ User Agency shall take prior permission from Hon'ble High Court for Mangrove cutting before issue of order for diversion of the forest land in accordance with Hon'ble Mumbai High Court order dated 27/1/2010 in PIL 87 of 2006;
- xv. User Agency shall obtain Environmental Clearance as per the provisions of the Environmental (Protection) Act, 1986, if applicable;
- xvi. The layout plan of the proposal shall not be changed without prior approval of Central Government;
- xvii. No labour camp shall be established on the forest land;
- xviii. Sufficient firewood, preferably the alternate fuel, shall be provided by the User Agency to the labourer after purchasing the same from the State Forest Department or the Forest Development Corporation or any other legal source of alternate fuel;
- xix. The boundary of the diverted forest land shall be suitably demarcated on ground at the project cost, as per the directions of the concerned Divisional Forest Officer;
- xx. No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;
- xxi. The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;
- xxii. The forest land shall not be used for any purpose other than that specified in the project proposal;
- xxiii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agencies, department or person without prior approval of Govt. of India;
- xxiv. Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEF&CC Guideline F. No. 11-42/2017-FC dt 29/01/2018;
- xxv. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife;
- xxvi. The compliance report shall be uploaded on e-portal (<https://parivesh.nic.in/>);

After receipt of a report on the compliance of conditions no iv, v (a), vi, vii, ix, xii and undertakings, duly authenticated by the competent authority in the State Government, in respect of all other conditions, from the State Government, formal approval will be considered in this regard under Section-2 of the Forest (Conservation) Act, 1980.


This issues with the approval of DDGF (C)/ Regional Officer (Central), Integrated Regional Office, MoEF & CC, Nagpur.

Yours faithfully,


(C. B. Tashildar)
AIGF (Central)

Copy to:

- i. The IGF (RoHQ), Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jorbagh Road, Aliganj, New Delhi- 110003
- ii. The PCCF (HoFF), Government of Maharashtra, Nagpur.
- iii. The Addl. PCCF & Nodal Officer (FCA), Government of Maharashtra, Nagpur.
- iv. User agency.
- v. Guard file.


(C. B. Tashildar)
AIGF (Central)

Annexure - 14



दूरध्वनीक 022-25220097

Email: dfommcu@gmail.com



महाराष्ट्र शासन

वनविभाग

विभागीय वन अधिकारी, मुंबई कांदळवन संधारण घटक
सांचे कार्यालय

ब.फ.ट. कामगार नगर, टिळकनगर स्टेशन जवळ, कुर्ली(पूर्व), मुंबई ४०००२४

No. Desk - 9/Land / ESZ / 1012 /2022-23

Date:- 25/07/2022.

To,

The City Engineer,

Navi Mumbai Municipal Corporation.

Sub: - Consideration by Thane Creek Flamingo Sanctuary (TCFS) Eco Sensitive Zone (ESZ) Monitoring Committee for the Proposal "Construction of Ghansoli to Airoli Creek Bridge by NMMC at Navi Mumbai.

- Ref:-
1. Ministry of Environment, Forest and Climate Change Notification No. S.O. 4293 (E) Dated 14.10.2021.
 2. Your letter no. NMMC/C.E./8681 dated. 10/12/2021.
 3. Thane Creek Flamingo Sanctuary Eco Sensitive Zone Monitoring Committee's meeting dated. 05/04/2022
 4. Your letter no. NMMC/C.E./2013 dated. 01/07/2022.

1. Ministry of Environment, Forest and Climate Change, Government of India vide Notification No. S.O. 4293 (E) dated 14.10.2021 Constituted a Monitoring Committee under the Chairmanship of Additional Principal Chief Conservator of Forests, Mangrove Cell, Mumbai for effective monitoring of Eco Sensitive Zone of the Thane Creek Flamingo Sanctuary.
2. Your proposal was received by this committee vide reference no.2 for the proposed "Construction of Ghansoli to Airoli Creek Bridge by NMMC at Navi Mumbai.
3. The proposal was discussed in Thane Creek Flamingo Sanctuary (TCFS) Eco Sensitive Zone (ESZ) Monitoring Committee's meeting held on dated 05.04.2022. The proposal was considered and was found to be in the scope of regulated activities in point no.18 as per above mentioned notification under reference no.1
4. The Project authority was asked to deposit 2 % of the project cost for the area of the project falling within Eco Sensitive Zone as "Conservation and Protection Fund" for Conservation and Protection of Mangroves and Marine Biodiversity. The project proponent has deposited Rs.1,58,46,000/-as Conservation and Protection Fund and intimated this office vide letter no. NMMC/C.E./2013/2022, dated. 01/07/2022.
5. The Thane Creek Flamingo Sanctuary Eco Sensitive Zone Monitoring Committee approves the Proposal 'Construction of Ghansoli to Airoli Creek Bridge by NMMC at Navi Mumbai.' subject to fulfilling the following conditions.

6. Specific Conditions: -

1	This order is only an approval of Monitoring Committee of Eco Sensitive Zone of TCFS as constituted vide notification dated 14.10.2021 and shall not be considered as environmental clearance. Environmental clearance and other permissions as applicable shall be separately obtained by project proponent as applicable to the project.
2	As the proposal involves diversion of forest land it shall be considered subject to obtaining permission of the Central Government under Forest (Conservation) Act 1980 and clearance of National board for wildlife wherever required.
3	This order is applicable only for layout plan submitted by project authority. If the project authority want to carry out any activity / development which is not shown in layout plan a separate proposal shall be submitted for the same.
4	The project authority shall keep adequate fire fighting equipment for forest fire incidences happening in the vicinity of the project. The quantity and type of forest fire equipment / man power shall be communicated and made available to the fire fighting agency / Forest Department as and when needed.
5	The proposal has been approved by the monitoring committee subject to obtaining all the relevant approvals from MCZMA, SEIAA and permission of the Hon'ble High Court wherever required.
6	Safety of any wild animal visiting the proposed facility during and after construction/development phase shall be the responsibility of the project proponent, should a rescue and rehabilitation of any visiting wild animal becomes necessary, Project proponents shall be bound to provide sufficient resources for it.

7. General Conditions: -

All activities in the Eco Sensitive Zone shall be governed by the provisions of the Indian Forest Act 1927 (IFA), Forest Conservation Act 1980 (FCA), Hon'ble High court Judgment 87/2006 dated. 17/09/2018 and Environment (Protection) Act 1986 (29 of 1986) and the rules made thereunder and are regulated in the manner specified hereunder vide clause no. 4 listing activities prohibited, regulated and promoted within the Eco-Sensitive Zone as shown Notification No. S.O.4293 (E) dated 14.10.2021.

1	The said project has been considered for TCFS ESZ monitoring Committee's clearance with reference to the scope of prohibited, regulated and promoted activities of the notification mentioned earlier for the ESZ of the TCFS.
2	The TCFS ESZ monitoring Committee's clearance has been considered without prejudice to the action initiated under EP Act or any court case pending in the court of law and it does not mean that project proponent has not violated any environment loss in the past and whatever decision under IFA, FCA, EP Act and of the Hon'ble Court will be binding of the Project Proponent. Hence this order does not give immunity to the project proponent in the case filed against him, if any or action initiated under the different acts.

3	In case of submission of false document and non-compliance of the stipulated conditions, ESZ TCFS Committee / authority / Environment Department will revoke or suspend this order without any intimation and initiate appropriate legal action under EPA 1986, IFA 1927 and FCA 1980.
4	The ESZ TCFS committee reserves the rights to add any stringent condition or to revoke the order if condition stipulated are not implemented to the satisfaction of the department or for that matter, for any other administrative reason.
5	In case of any deviation or alteration in the project proposed from those submitted to this department for clearance, a fresh reference should be made to the department to assess the adequacy of the condition(s) imposed and to incorporate additional environmental protection measures required, if any.
6	The above stipulations would also be enforced among others under the Water (Prevention and control of pollution) Act, 1974, the Air (Prevention and control of pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling) Rules, 1989 and its amendments, The Public Liability Insurance Act, 1991 and its amendments.
7	This ESZ clearance is issued subject to obtaining NOC from the statutory bodies as applicable to this project.
8	If applicable, consent for establishment shall be obtained from MPCB under Air and Water Act and copy shall be submitted to the Environment Department before start of any construction work at the site.
9	All required sanitary and hygienic measures should be in place before starting construction activities and should be maintained throughout the construction phase.
10	Adequate drinking water and sanitary facilities should be provided for construction workers at the site. Provision should be made for mobile toilets. The safe disposal of waste water and solid waste generated during the construction phase should be ensured.
11	The solid waste generated should be properly collected and segregated. Dry / Inert solid waste should be dispose off to the approved sites for land filling after recovery of recyclable material.
12	Arrangements shall be made to ensure that waste water and sea water do not get mixed.
13	The diesel generators sets to be used during construction phase should be low sulphur diesel type and confirm to Environment (Protection) Rules prescribed for air and noise emission standards.
14	The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from concern authority shall be taken.
15	Vehicle hired for bringing construction material to the sites should be in good condition and should have a pollution check certificate and should confirm to applicable air and noise emission standards and should be operated only during non-peak hours.
16	Ambient noise level should be confirmed to residential standard both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should make to reduce ambient air and noise level during construction phase, so as to confirm to the stipulated standard by CPCB / MPCB.

17	Ready mix concrete must be used in building construction.
18	Under the provisions of Environment (Protection) Act 1986 legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.
19	Regular supervision of the above and other measures for monitoring should be in place all through the construction phase, so as to avoid disturbance to the surroundings.
20	A complete statement of all the documents submitted to department should be forwarded to the local authority and MPCB.
21	A separate environment management cell within the PP with qualified staff shall be set up for implementation of the stipulated environmental safeguards.



(M. Adarsh Reddy)

Member Secretary

Thane Creek Flamingo Sanctuary

ESZ Monitoring Committee

And

Divisional Forest Officer

Mumbai Mangrove Conservation Unit