PIMPRI- CHINCHWAD MUNICIPAL CORPORATION

PIMPRI, PUNE- 18

ADDENDA

FOR

INTERNATIONAL COMPETITIVE BIDDING

OF

Design and Construction of Bridge on Pawana River, Flyover/Viaduct and ROB with Approaches & Ramps on Kalewadi Phata to Dehu Alandi Road.

INDEX

CORRIGENDUM -1

FOR INVITATION FOR BIDS

PIMPRI CHINCHWAD MUNICIPAL CORPORATION
PCMC Main Building, Mumbai- Pune Road, Pimpri, Pune -411 018.
INVITATION FOR BIDS – CORRIGENDUM -1
FOR

Design and Construction of Bridge on Pawana River, Flyover/Viaduct and ROB with Approaches & Ramps on Kalewadi Phata to Dehu Alandi Road
Date:-16/08/2010.
IFB No.:- **17 /2010-11**
Project ID: P110371

INTERNAIONAL COMPETITIVE BIDDING (ICB)

The addenda according to prebid meeting held on 03rd Sept 2010 for this bid is available at the following address. Bidders are requested to collect their copy of addenda.

The Following dates are amended pertaining to the bids.-

1. Last Date of Sale of Bid Documents : - 25/10/2010 up to 15.00 Hrs.
2. Last date of receipt of Bid Documents : - 26/10/2010 up to 15.00 Hrs.
3. Date of Opening of Bid Documents : - 26/10/2010 at 15.30 Hrs.

Adv No:-136
No:-Engg/TD/1/ws/654/2010.
Date:- 01/10/2010

Sd/-
Commissioner
Pimpri Chinchwad Municipal Corporation,
Mumbai Pune Road, Pimpri – 411 018
Maharashtra State, India.
Phone No.:91-20-67333333
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REPLIES TO QUERIES

Text of Questions (Queries) raised by intending Bidders and PCMC's Response (Clarifications) thereon.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
1	Drawings	Vol. IV		**Clear Drawings**: - Dimensions and details on the drawings are smudged and not visibly clear. Please provide clear drawings. Also, we request your good self to please issue soft copy of all drawings.	Please refer Sr. No. 19 of addendum.
2	Cl.4.19	Vol-I, Pg 110,	Contractor shall obtain his own supply of water, electricity, fuel, etc.	**Electricity, Water & Gas: -** We request you to please provide electricity and water required for the works nearby the site area free of cost.	IFB conditions shall prevail.
3				**Land for Labour Camp, Offices, Stores, Batching Plants, Casting Yards, etc**. :- We request your good self to please provide free of cost land for establishing Site Office, Godowns, stores, Workshops, Fabrication & Assembly yards, casting yard, plants, labour camp, etc near by the site. This will help in reducing the leads and travel times.	IFB conditions shall prevail.
4	Cl. 1.1.3.7	Vol-I, Pg 134,	1825 days	**Defects Notification Period: -** We request you to please reduce the DFP to 2 years from Completion of Project.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
5	Cl. 14.2, 14.2(b)	Vol-I, Pg 135,	5% of Accepted Contract Amount, Recovery at 10% of each IPC	**Advance Payment: -** We request your goodself to please provide interest-free advance of 10% of Accepted Contract Amount within 15 days from LoA and recovery at pro-rata basis.	IFB conditions shall prevail.
6				**Machinery Advance: -** We request your goodself to please provide interest-free equipment advance of 5% of Contract Price within 15 days from LoA and recovery at pro-rata basis.	IFB conditions shall prevail.
7	Cl. 20.3	Vol-I, Pg 137,	Appointment of DB : President, IRC, New Delhi	**Disputes & Arbitration: -** We request as per the Arbitration & Conciliation Act 1996, three arbitrator panels should be allowed to conduct the proceedings. Also, two arbitrators should be appointed one by either party and the third to be appointed by selected two arbitrators.	IFB conditions shall prevail.
8	Details of Provisional Sums	Vol-I, Pg 74,	Details of utility shifting given.	**Shifting of Utilities, Electric Towers: -** We request you to please hand over encroachment-free and clear RoW to the Contractor. We further request you to please keep shifting and relocation of utilities in Employer's Scope.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
9				**Second Prebid Meeting: -** We request you to please arrange a second prebid meeting so as to clarify some queries further.	IFB conditions shall prevail.
10		Vol IV		Please provide the all tender Drawing in Cad format in 2009 version	Please refer Sr. No. 19 of addendum.
11	Clause 2 .4.2	Vol I Pg. No.48		Refer Volume-1, Clause 2A.2, Specific Experience; we request to consider the Certified value of ongoing works similar works of value 800Million or more.	IFB conditions shall prevail.
12	Clause 2 .4.2	Vol I Pg. No.48		Refer Volume-I, Clause 2.4.2, I, II, Ill, Specific experience, we request to consider last 10 years experience.	IFB conditions shall prevail.
13		Vol II		Kindly clarify the scope of works?, the Scope of Design & Construction limited to only design & Construction of bridge or near by service lane road , Storm water drain, Sewage water line also to be designed?	Please refer Sr. No. 18 of addendum.
14				Can we design the Bridge with PSC I Girder?	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
15				The entire construction area for Bridge Construction will be handed over to Contractor? Or Should we allow the below traffic, in such case what is the right way allowed for project execution.	IFB conditions shall prevail.
16				Kindly Clarify the price quoted inclusive of all taxes like custom duty / VAT / Royalty etc? Or VAT shall be reimbursed at actual	IFB conditions shall prevail.
17				This project exempt from service tax?	IFB conditions shall prevail.
18				Kindly Clarify In case any delay of handing over of site from employer as specified in tender, the idle charges for machinery, Labour shall be paid extra?	IFB conditions shall prevail.
19				We request the Material advance of 90% of Materials received at site against submission of indemnity bond.	IFB conditions shall prevail.
20				This project requires heavy machinery; We request to provide Plant & Machinery advance 5%, against Machinery received site.	IFB conditions shall prevail.
21				Can we submit the Bank guarantee to	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				substitute the retention money?	
22				Kindly approve the Price Variation Clause for Reinforcement steel as per Sail Prices and Cement as RBI Index and fuel as per Indian Oil Price up to 85% of price. Otherwise it is very difficult to arrive and upfront load the cost in the project.	IFB conditions shall prevail.
23				The existing utilities will be shifted by the employer well before handing over of site to contractor.	IFB conditions shall prevail.
24				If any existing permanent building/structure falling with in the flyover line will be demolished and handed over to contractor.	IFB conditions shall prevail.
25				Kindly furnish the drawing for Existing Charted utilities and permanent Structures with in Fly over portion?	Please refer Sr. No. 19 of addendum.
26				If any uncharted utility encountered during project execution, we request to pay the actual +20% for OH & Profit.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
27	2.4.2 Specific Experience	Page No 48 Vol I	Participation as contractor, or subcontractor, in at least one each with a value of at least INR Eight Hundred Million (800) million, that have been successfully and substantially completed and that are similar to the proposed works.	We understand that if tender is be quoted by Joint Venture, technical specific has to be fulfilled by all partners collectively and not in proportion to their percentage participation in joint venture. It is also mentioned that each partner must meet requirement of one characteristic. Please clarify that.	IFB conditions shall prevail, Please refer Sr. No. 8 of addendum.
28	ITB 22.1	Page No 35 of Vol I	Deadline for bid submission.	You are requested to extend the bid submission at least 30 days after clarification of prebid quarries or 15th October 2010 whichever is later.	Please refer Sr. No. 15 of addendum.
29	Clause 2.3.2 of Section III	Vol.1, Page No 43, 44		As per Clause 2.3.2 of Section III Vol.1, average annual turnover is stipulated as 600 million within last three years. It is requested to clarify whether annual turnover is to be updated to 10-11 price, as in case of bid capacity mentioned in Clause No.2.3.4 of the same volume.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
30	Clause No.2.3.3 of Section III of	Vol.1 Page No 43,		It is presumed that cash flow of one partner should be 51% of 99 million. Please confirm.	IFB conditions shall prevail.
31	Clause 2.4.2 of Section III	VoI.I pg. no. 35		This clause pertains to specific experience. It is mentioned that participation as contractor, management contractor, or subcontractor in at least one contract, within the last five years should be 800 million and at least one partner should meet 51% requirement. In this case there is some ambiguity about physical work & cost of work. Vehicular river bridge of minimum 100 metres/the vehicular flyover of minimum 100 metres/ or railway bridge,taken all together may not cost Rs.800 million as per the requirement. Therefore a bidder who has constructed all the three categories can not qualify for this work. Thereforewe we wish the condition may be relaxed in view of the following. a] For want of bid capacity/annual turnover we were not in a position to quote for such single work. However within a period of three years i.e.between Feb.2006 to Feb.2009. Our partner has simultaneously	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				completed each of similar type of work as under : Name of bridge Cost in [Rs.Crs] 1] Bridge across Kajirbhati Creek at Ratnagiri 110 m - Rs.2.18 2] Bridge across Godawari River at Kopergaon City 217 m - Rs. 3.26 3] Bridge across Godawari River at Nanded City 374 m - Rs. 14.81 4] Minor bridges at Nanded City. - Rs.6.09 5] Bridge across Karha River at Baramati,Pune. -Rs.2.10 6] Bridge across Ghod River at Kashti Tandali,Ahmednagar. - Rs.4.60 7] Bridge across Godawari River at Kumbhari,Ahmednagar250 M - Rs. 5.14 8] R.O.B.at Autogems near Dapodi,Pune. ROB,-45m Flyover 220 m -Rs. 12.37 **Total Rs. 50.55 crores** Cost of these works, works out to Rs.50.55 crores and meets the requirement. Similarly	

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				we have worked as subcontractor for the works cost of which is Rs.300 crores and our participation is to the extent of Rs.30 crores. It is worth noting that we are specialized in pile foundations with rotary rigs and are doing the job successfully for last 15-20 years. In this particular work foundations is the critical activity.	

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
32	Clause 12 of ITB Section IV Bidding Forms	Vol.I pg. no. 16 Vol.I pg. no. 55		As per this clause bidder has to provide the information of bill of quantities & prices thereof in the forms specified in the Section IV of bidding forms. In Section IV for bill of Quantities it is commented that "bookmark is not defined" It is presumed that the bill of quantities & prices are not to be supplied along with bid. Please confirm.	IFB conditions shall prevail. Please refer Sr. No. 1 of addendum.
33	Clause 1 of Section III f evaluation & qualification	Vol.I Page 37 & 38		As per this Clause technical alternatives are not permitted. If such is the case, is the bidder to execute the work as per drawings supplied by the employer? Please confirm. In case alternative designs are to be submitted, period for submission of bid on the bidder's design is very small and therefore alternative designs after the offer is accepted at the same cost quoted in the bid may be allowed.	IFB conditions shall prevail.
34				Date of submission of bids may be extended to one month after receipt of Common Set of Deviations.	Please refer Sr. No. 15 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
35	IX	Page No 41 of Vol II	Minimum length of span for Flyover shall not be less than 25m. Other ramps shall have span arrangements as approved by Engineer.	Please clarify both the points and we hereby requesting you to allow minimum length of span as 20m.	Please refer Sr. No. 18 of addendum.
36	(f)	Page No 51 of Vol II	The depth of the superstructure shall be such that span to depth ratio is not less than 15 for box girder and 12 for I Girder	Please clarify this point.	Please refer Sr. No. 18 of addendum
37	2. XI	Page No 41 of Vol II	RESTRICTION ON TYPE OF STRUCTURES : Any type of RCC Superstructure	You are requested to allow us RCC type of Superstructure.	IFB conditions shall prevail.
38	5	Page No 69 of Vol II	Land for labour camps, storage yards temporary site sheds etc, will be arranged by the contactor at his own cost.	You are requested to provide us the rent free land for Storage yard, Labour camp, site office and Batching plant etc.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
39	12, 18, 24 and 31	Page No 63 to 66 of Vol I	Tree cutting,shifting of poles, Elecrtical lines , cable etc.	Total percentage kept under this head in specified limit of payment as percentage of accepted contract Amount is 8.2 % . The same scope is given in Provisional Sum refer Vol I Page no 74 and provisional sum is not included in lumpsum quotated cost, please clarify the same. ie The payment of Tree cutting , shifting of poles Electrical Lines , cable etc will be from Payment breakup schedule or from Provisional Sum.	Please refer Sr. No. 2 of addendum.
40	10,23 and 29	Page No 63 to 66 of Vol I	Payment for electrification (Not covered under provisional sum) etc	Total percentage kept under this head in Specified limit of payment as percentage of accepted contract Amount is 8.25 % . We hereby requesting you to revise the above said percentage as it is on higer side.	Please refer Sr. No. 2 of addendum.
41	32	Page No 66 of Vol I	Payment on account of providing and erecting noise barriers in between River Bridge to ROB and from ROB to Pune Mumbai Highway of Flyover / Viaduct portion.	Total percentage kept under this head in Specified limit of payment as percentage of accepted contract Amount is 15 %. We hereby requesting you to revise the above said percentage as it is on higher side. Also clarify that if you delete the same scope from contract then?	Please refer Sr. No. 2 of addendum. IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
42	34	Page No 66 of Vol I	Payment on account of completion of Rigid pavement of main carriageway of Existing Mumbai Pune Highway in balance portion.	We hereby requesting you to clarify detail scope of work which is not given in tender document of Vol II.	Please refer Sr. No. 18 of addendum.
43	19	Page No 64 of Vol I	Payment of Miscellaneous items like kerb, painting/ protective coat to ROB , Wearing coat, lane marking , traffice sinages , gantries & Construction of all stairacses etc. of Rail Over Bridge On Pune Mumbai Rail Line.	Please refer Vol II, Page no 21 component 8 wherein which you have defines scope of work ie four numbers of individual dog legged staircases, each number consist of One Escalator (up & dn) and one electrically operated Lift for Physically Handicapped. But in payment break up schedule you have mentioned only the payment of Staircases what about the Payment break-up of Escalator and Lift. Also clarify that how you will do the payment of Escalator and staircase which is to be provided at the Bus stop location. In the view of above we hereby requesting you to clarify how you will do the payment break-up of Component 8.	Please refer Sr. No. 18 of addendum. The work of Escalators, Lifts and Bus Stops/Shelters has been deleted from the scope.
44		Page No 22 & 23	Component 9	The payment for the same component is not included in **SCHEDULE OF PAYMENT** of Vol- I PAGE 63,64,65 and 66. Please	Please refer Sr. No. 2 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
		of Vol II		clarify the mode of payment for the same.	
45		Page No 12 to 25 of Vol I		We hereby requesting you to revise the payment breakup schedule as per the given scope of work in Vol-II Page no 12 to 25.	Please refer Sr. No. 2 of addendum.
46		Page No 67 to 69 of Vol I		In table for Adjustment of Contract price you have not mentioned the following Item 1) Cost per sqm variation in Deck area of River, Rob and balance flyover. 2) Cost per m of River Bridge, ROB and balance flyover 3) RE Walls at Flyover portion as well as for Ramp portion.	IFB conditions shall prevail.
47		Page No 309 to 332 of Vol III		In soil investigation report you have not given Test results of Rock sample you are requested to provide Test results of Rock.	IFB conditions shall prevail.
48		Page No 103 of Vol I	A CD contating SOFT COPY of all drawings is also enclosed with Vol-I to Vol-IV to enable bidders to have a print of larger scale if	CD is not enclosed in Vol-IV, You are requested to provide us SOFT COPY of all Drawing because Drawings which are given in Vol-IV are not visible.	Please refer Sr. No. 19 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			required.		
49	ITB 22.1	Page No 35 of Vol I		We request you to extend the submission date up to 12th October 2010, so that we shall be in position to prepare drawing , design, get competitive quotation from specialised agencies , arrange site visit, prepare detailed rate analysis, site fixed Expences etc. which will enable us to submit the most competitive tender. This will be in the best interest of the project and client. Also note that present date of submission of Bid is on 4/10/2010 and prior to that two public holidays are there ie (2nd October and 3rd is Sunday).	Please refer Sr. No. 15 of addendum.
50		Vol IV		Cross section of Viaduct portion of Ramp is not given in Tender document; you are requested to provide the same.	Please refer Sr. No. 19 of addendum.
51	6.3.2	Page No 48 of Vol II	In no case the capacity of Pile Shall exceed 500 Mt under normal condition.	It should be 500 Mt per Sqm.	Please refer Sr. No. 18 of addendum.
52		Page No 21 of	Component 8	Detail Specification for Escalator is not Given in Tender document you are	Please refer Sr. No. 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
		Vol II		requested to provide us the same.	
53		Page No 28 of Vol II	Contractor shall handle missing link first, carry out ground improvement works and monitor the settlements over the period of time.	Please clarify the scope of Missing link in detail and mode of payment.	Please refer Sr. No. 18 of addendum.
54		Page No 74 of Vol I	Provisional Sum	Please clarify whether the amount of Provisional sum is Rs. 41milion in total or 5% of project cost .(Refer Appendix to tender/Contract Data Sub Clause 13.5 b ii)	IFB conditions shall prevail.
55	Appendix to tender	Page No 74 of Vol I	Provisional Sum :- 5%	Please clarify whether the amount of Provisional sum is Rs. 41milion in total or 5% of project cost .(Refer Appendix to tender/Contract Data Sub Clause 13.5 b ii)	IFB conditions shall prevail.
56	I.ix/41	II		GAD furnished shows spans of 20m/23m also. Are such deviations permitted?	Please refer Sr. No. 18 of addendum.
57	4.4/45	II		This implies NO CHANGE in GAD already prepared.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
58	4.2 (a) /44	II		Centre line of structures shown in GAD cannot be changed. As such are the drawings and details so furnished stand mandatory binding and final?	IFB conditions shall prevail.
59	5/45 .	II		As details of GAD has to be followed, Does this imply that foundations as indicated need to be followed? Can designer based on it's soil investigation propose open foundations instead of Pile foundations or vise versa?	IFB conditions shall prevail.
60	5 (c)/46	II		How is the quote for additional boring to be accommodated in the bid?	Please refer Sr. No. 18 of addendum.
61	2.i/41	II		Structures like continuous, rigid frames .etc are restricted. Are rigid portal frames for via ducts permitted?	IFB conditions shall prevail. IFB conditions shall prevail.
62	2.v/41	II		Structures with continuity only in deck slab, in transverse direction restricted. Does this imply that longitudinal Continuity in Deck slab is permitted?	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
63	I.v/41	II		With aforesaid restrictions how can construction joints minimized?	IFB conditions shall prevail.
64	8/50,12/54,14/55	II		With various provisions as PSC Box Girders, PSC Segmental construction, PSC Voided slab structure can be opted for.- Is cast-in -situ constructions allowed? Can both launching and cast-in- situ practices adopted?	Please refer Sr. No. 18 of addendum
65	67,68&69	Vol I		Table for adjustment of contract price specifies various item these need to be elaborated and clarified- I. Base for adjustment needs to specified and also SBC needs to be furnished. 2. The variations are based on depth criteria How does the bid make allowances for deviations in AREA's of base of foundation? 3. How does bid account for variation in Superstructure i.e if spans are varied-deviation in length.	IFB conditions shall prevail. IFB conditions shall prevail. IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
66	2.1/134	I		Land for Ramps at Pawana River bridge & that at city centre end is expected to be provide only AFTER 180 days of commencement - Requested to specify time span with in which this area is expected to be handed over.	IFB conditions shall prevail.
67	8.7/135	I		Delay damages are related to work executed in each section as specified at p. no 137& 138/Vol I - As the works prescribed there in, overlap on other sub sequent sections this system needs to be reviewed- % work done in accordance to the planning schedule can be a better option.	IFB conditions shall prevail.
68	1.1.3.7/134	I		Defect notification period specified is 1825 days	IFB conditions shall prevail.
69	11/116	I		Specifies self inspection and rectify the defects. It's required to clarify that who maintains the structure with in the defect liability period? Scope of works related to maintenance & defects needs to be specified.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
70	75,76,85,86	III		At various instances various laboratories for material/product testing are specified..e.g. PCMC approved reputed lab- in this case the enlisted labs may pl. be provided. Field lab, PCMC material lab, labs of VJIT, IIT, NHAI App. Lab... Testing process & labs trusted need to be specified/ clarified.	IFB conditions shall prevail.
71	p.no.68	III		There are certain references to DPR of the project. AS copy the same be made available. Scope of work in lieu with the DPR provisions be clarified/specified.	Please refer Sr. No. 3 of addendum.
72		IV		Copies of drawings are not freely legible at many occasions. Requested to furnish legible sized drawings/Soft copies (PDF) be suitably provided	Please refer Sr. No. 19 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
73		IV		Stair/Escalator details made available, however BRTS Bus stop details need to furnish.	Please refer Sr. No. 18 of addendum.. The scope of work of Escalators, Lifts and Bus Stops/Shelters has been deleted from the scope.
				Bid is silent on probable price escalations, It's understood that price variations shall be provided for the basic ingredients such as CEMENT, STEEL. HT Cables, BEARINGS, FUEL calculated on RBI indices in that case please clarify the basic rates.	IFB conditions shall prevail.
				Bid is silent on the probabilities of variation / induction of various Govt. taxes due to changes in govt. policies - this needs to clarified.	IFB conditions shall prevail.
74	63,64,65 & 66	I		This being own designed Lump sum Contract; bidder shall submit its own Schedule of Payment along with the bid.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
75	66	I		Unit -32 Indicate Installation of noise barriers details of which needs to be elaborated such as scope of work and its working components enabling us evaluate and considering the cost of the same.	Please refer Sr. No. 4 of addendum.
76	22 viii/60	II		Architectural treatments/features as expected need to be narrated so that cost can be envisaged, details need to be furnished- Work shall be executed as per approved drawing and after thought may be restricted to be minimum	IFB conditions shall prevail.
77	24 viii/62	II		It is prescribed pier including pier cap to be casted in single pour- This is not advisable- Concrete shall have to pass through pier cap reinforcements grids. Tending it to segregate- vibration and consolidation of concrete through pier cap steel in the core of pier shall also be difficult hence this is not advisable, We proposed casting a pier in the single pour with casting of cap in the second pour. This need to be affirmed.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
78	SECTION VI EMPLOYERS REQUIREMENT Component No 1	Page No 12 of Vol II		It is stated that "…Longitudinal Profile and horizontal geometry shall remain un changed as shown in the Drawing Volume (Volume IV) as obligatory requirement". However the drawing do not provide any horizontal as well as vertical profile. Please furnish these geometric details.	IFB conditions shall prevail.
79	SECTION VI EMPLOYERS REQUIREMENT Component No 1	Page No 12 of Vol II		It is stated that "…cosntruction of facilities to carry utility lines all along the river bridge, in anti crash barrier, footpaths...". However the drawing / document do not give details of the utility lines to be carried. Please furnish these details.	Please refer Sr. No. 18 of addendum.
80	SECTION VI :EMPLOYERS REQUIREMENT Component No 1	Page No 12 of Vol II		The bridge length is shown as 120m (i,e. 4x30m) in Drawings while it is mentioned as between Ch. 3+010 to 3+140 in the document (which means 130m length). Please clarify which is correct.	Please refer Sr. No. 19 of addendum.
81	SECTION VI : EMPLOYERS REQUIREMENT Component No 2	Page No 13of Vol II		For continuous flyover between Pawana River and ROB, It is stated that the scope includes provision & erection of Noise Barrier on both side of the Flyover. Please clarify whether it is required on both side of 'each' carriageway or on both side of total	Please refer Sr. No. 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				carriageway.	
82	SECTION VI EMPLOYERS REQUIREMENT Component No 2	Page No 13of Vol II		For Portals at P5 to P9 and P14 to P16, please furnish the details of portal span. Is there any road below the portal ? Vertical Clearance requirement below soffit of portal ?	Please refer Sr. No. 18 of addendum. There is road below portal frame. Clearance of 5.50 m. below soffit of Portal frame beam is required.
83	SECTION VI : EMPLOYERS REQUIREMENT Component No 3	Page No 15 of Vol II		It is stated in the scope of work, that "Construction of retaining wall ….as shown in GAD" The retaining wall shown in the GAD is very sketchy, without any information. Ground Profile to assess the length and height of retaining wall shall be given. Or else, these may be furnished for the purpose of tender.	Please refer Sr. No. 18 of addendum.
84	SECTION VI :EMPLOYERS REQUIREMENT Component No 4	Page No 15 of Vol II		No details of elevated bus stop furnished. Request kindly furnish these details so that assessment of quantities can be made.	Please refer Sr. No. 18 of addendum. The work of Escalators, Lifts and Bus Stops/Shelters has been deleted from the scope.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
85	SECTION VI EMPLOYERS REQUIREMENT Component No 4	Page No 15 of Vol II		Last line states that "….railing between Ch. 4+340 to 3+390". This shall be changed to "….railing between Ch. 4+340 to 4+390".	Please refer Sr. No. 18 of addendum.
86	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 37of Vol II		Carriageway Width is stated as 9.00m and 11.00m while drawing indicates different carriageway width. Please clarify.	IFB conditions shall prevail.
87	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 37of Vol II		For seismic effects, the importance factor is stated as 1.5. As per IRC:6-2000, the importance factor is 1.2. Kindly review	Please refer Sr. No. 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
88	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 38,49 of Vol II		Diameter of pile is stated as 1.2m (Minimum). As per the latest IRC:78 (June 2009 amendment), the minimum pile diameter for river bridges is 1.0m and not 1.2m (Clause 709.1.7). Moreover there is contradiction in clause 6.3.3 (5) and 6.3.3 (12) in this regard. Kindly review this clause in light of this.	Please refer Sr. No. 18 of addendum. For the dia of Piles IRC provision shall govern except ROB Portion. For ROB Portion the provisions of Indian Railway Standards (IRS) shall govern.
89	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 45 of Vol II		As per clause 4.4, Span Arrangement as shown in the Tender Drawing can not be changed. Whereas the tender document mentions about obligatory spans at number of places, giving the impression that other the obligatory spans, span arrangement can be modified. Please clarify the intent.	IFB conditions shall prevail.
90	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 47 of Vol II		Clause 6.1.3 states that maximum SBC is 100 t/sq.m under worst combination of loads. Please clarify whether under load combination with seismic / wind, additional 25% increase in SBC will be permitted or not. This is as per IRC:78-2000.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
91	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 47 of Vol II		As per clause 6.1.6, no tension is permitted in base pressure under worst combination of loads. This is contrary to provisions of IRC:78-2000, according to which, loss of contact upto 33% is permitted. Please review.	Please refer Sr. No. 18 of addendum.
92	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 48 of Vol II		In clause 6.3.1 (b), it is stated that "Shift & Tilt of Pile shall be considered as per IRC:78-2000". There is no such clause in IRC:78. Kindly delete this clause.	IFB conditions shall prevail.
93	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 49 of Vol II		Clause 6.3.3 (2) states that lateral load carrying capacity of pile is to be assessed by carrying out lateral load test on a single pile for a deflection of 5mm at top. This provision is modified in present IRC:78-2000. Moreover, these provisions are for normal service stage load combination only and not applicable under seismic / wind load combination. This requires confirmation.	Please refer Sr. No. 18 of addendum. IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
94	SECTION VI : EMPLOYERS REQUIREMENT Chapter No IV DESIGN CRITERIA FOR STRUCTURES	Page No 52of Vol II		The temperature range given in clause 9.4 is contrary to what is given in page 37 of the same document. Please clarify which one is correct.	Please refer Sr. No. 18 of addendum.
95	VOLUME IV - Drawings			Drawings are not legible. Bigger sized drawings are required. It is requested that soft copies of these drawings be given.	Please refer Sr. No. 19 of addendum.
96	VOLUME IV - Drawings	Page No 2 of Vol IV		The RE Wall is shown for 150m from Ch 2+860 to Ch 3+010. This is contrary to provisions given in Employers Requirement, according to which the RE Wall length required is 210m. Please clarify which one is correct.	Please refer Sr. No. 19 of addendum.
97	VOLUME IV - Drawings	Page No 2 of Vol IV		Width of median is given as 0.3m. As per clause 112.1 of IRC:5-1998, minimum median width shall be 1.2m. Please review and confirm.	IFB conditions shall prevail. Due to site restrictions, median is to be provided as shown in drawing.
98	VOLUME IV - Drawings	Page No 2 of Vol		Drawing indicates a multicellular abutment at A1. Is it mandatory to have cellular	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
		IV		abutment? Please confirm.	
99	VOLUME IV - Drawings	Page No 2 of Vol IV		Note No. 10 of this drawing says that Design Velocity shall be confirmed by bidder. The design velocity is already given in Chapter IV, Section VI of the Tender Document. This requires clarification.	Yes, bidder has to confirm Design velocity. The velocity should not be less than 4.9 m/sec and afflux should be calculated by the bidder.
100	VOLUME IV - Drawings	Page No 3 of Vol IV		Drawing shows portal frame structures for supporting the deck. The c/c of piers in portal shall be furnished. It is not clear from the drawing at all.	IFB conditions shall prevail.
101	VOLUME IV - Drawings	Page No 4 of Vol IV		Details of Retaining Wall to be constructed on one side to retain the existing slope shall be given (i,e. length of retaining wall required)	IFB conditions shall prevail.
102	VOLUME IV - Drawings	Page No 9 of Vol IV		Though the title of the drawing is "DETAILS OF EXISTING UTILITIES", the utilities are not clearly marked in the drawing. It is suggested that a clear drawing with utilities marked in color be given.	Please refer Sr. No. 19 of addendum.
103	Clause 4.1 (a) of ITB		JVA partner shall not be more than two	Why such restriction has been imposed on the number of JV partners ?	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
104	clause 11.1 (b) of ITB		The bidder shall submit the following documents along with the bid: any proposals for subcontracting elements of the work such that the total value for each work should be more than 10% of the bid price and aggregate should not exceed 25% of the Accepted Contract Amount	10% of the bid price is too high amount for each subcontracting item and it means that the clause restricts up to 2 subcontractors only. The minimum value of subcontracting should be reduced to 5%	IFB conditions shall prevail.
105	Clause 32.1 of ITB		conversion to single currency : Exchange rate date shall be the date of opening of bids	Bids are not necessarily submitted on the last date (bid due date). So the exchange rate should be the rate on a specific date earlier than the date of opening for the bid (say 28 days before the bid due date)	Please refer Sr. No. 5 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
106	Cluase 2.1 of Appendix to Tender / Contract Data		Time for access to site : No later than the commencement day except for the following parts: the land for ramp near existing highway in front of proposed city Center and land req for approach to Pawana bridge shall be handed over after 180 days from commencement date. Commencement date shall be within 42 days of receipt of LOA by the contractor	Please provide the details / status of land acquisition for the entire stretch. (Construction period is very stringent and hence all works needs to be planned effectively.	IFB conditions shall prevail.
107	Details of Provisional Sums Page 74 of Vol I		Relocation of Utilities like water ,aoms. Sewer lines, storm water lines, electrical underground cables, HT lins … etc. All necessary permisions and coordination will be done by the contractor	This item includes permission for tree cutting, permission for the relocation / removal / construction of various categories of utilities from the concerned departments' permission from the railways, etc. The Employer is requested to obtain such permissions / approvals as and when required from the authorities concerned and transfer the same to the contractor. This	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			for utility works.	would assist in faster execution of the works.	
108	Clause 14.3 of Contract Data		When the taking over certificate is issued first half of the retantion money shall be certified by the Engineer. The second half shall be released only after the expiry of the Defects Notification Period.	There is no provision of substituting the second half of retention money with BD at the time of taking over of works in the said clause (GCC or PC). Whereas a format of Retention Money Security has been provided on page 147 of Volume I of tender documents. Please clarify whether replacing the second half of retention money is permissible under the conditions.	IFB conditions shall prevail.
109	Section IV BOQ		Details of Provisional sums: Relocation of Utiliites such as water mains, electrical utilities, HT lines of the Railways, tree cuttting works, etc including all necessary permissions and cordination works shall be done by the contractor. Works of traffic signals and	There are many items under the first part of the provisional sums (relocation of utilities) and detailed break up of payment is not mentioned. Please provide the mode/ rates of payments for the provisional sums as the same is also linked to the Schedule of payment of the bid price.	Please refer Sr. No. 20 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			landscaping, arboriculture including plantation, maintenance for 5 years is also included.		
110	Section IV Chapter III clause 2.8		If during the course of execution of the works utilities are encountered, such utilities shall be shifted by the contractor and the expenses shall be reimbursed as per the estimate prepared by the concerned department and approved by the Employer. In case it is not possible to shift the utilities, the permanent structure shall be modified at no extra cost to eh employer.	Such extra cost of modification of the permanent structure due to physical impossibility of shifting of the utilities should be borne by the employer and not the contractor. Request to amend the clause	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
111	Clause 14.1 (e) of PC		The contractor's equipment, including essential spare parts, imported by the contractor for the purpose of executing this contract shall be exempt from the payment of import duties and taxes upon importation	Please provide the relevant format / procedure for availing the same	Please refer Sr. No. 6 of addendum.
112	Invitation for Bids		This project is funded by International Bank for Reconstruction and Development	Will Excise Duty exemption be available to the contractor for purchase of materials, goods and various inputs to works in this project, as it is a project of national importance funded by IBRD? Please clarify and provide the format for availing the excise duty exemption	IFB conditions shall prevail.
113	Volume-IV of IV			**Tender Drawings: -** Soft copies/CD will be required for clarity in study & preparation of BOQ.	Please refer Sr. No. 19 of addendum

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
114	Volume-II, ANNEXURE-I: "Dimension of Box Girder"			**Dimension & Type of Box Girder: -** The shape/ type of Box girder shown in Annexure-I is not matching with the type shown in drawings. (VOL-IV, Drawing Title- "GAD for Bridge on Pawana River-Component-1", "GAD for balance Flyover/Viaduct portion-Component-4", "GAD Descending Ramp in front of proposed City centre-Component-7") Whether bidder can select the box section as per structural requirement? Please clarify.	IFB conditions shall prevail.
115	Volume-II, cl. 8 (a): "Superstructure - General"			**Box girder or pre-cast 'I' girder section over ROB** :-As per cl. 8 (a), "Only PSC Box / PSC voided slab-type superstructure is allowed in all locations except in ROB portion if railway authority does not allow for box type Superstructure. Alternatively pre-cast 'I' girder section may be provided for obligatory span of ROB if insisted by railways as per their requirements." Whether steel girder or PSC sections other than box sections can be adopted? Please clarify.	Please refer Sr. No. 18 of addendum

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
116	Volume-II, cl. 6.3.3 (3): "Pile Foundations"			**Skin Friction: -** The skin/ side friction from G.L. upto embedment level, as mentioned, should not be considered during design. This is not as per any codal requirement (IS/IRC). Please confirm.	IFB conditions shall prevail.
117	Volume-II, cl. 6.3.3 (1): "Pile Foundations"			**Number of Initial Pile load tests, Routine Pile load tests & Integrity tests: -** Can you please specify the number of Initial Pile load tests, Routine Pile load tests & Integrity tests to be conducted?	Please refer Sr. No. 18 of addendum .
118	Volume-II, cl. 7.1 & 7.4: "Substructure"			**Min. dimension of any element of substructure** :-As per cl. 7.1, it is specified that min. dimension of any element in substructure should not be less than 300 mm, whereas in clause 7.4, the height of pedestal bearing has been limited to minimum 150 mm. Please clarify.	Please refer Sr. No. 18 of addendum
119	Volume-II, cl. 7.8: "Substructure"			**Grooves in substructure & superstructure :-** In tender drawings, no grooves are shown in piers, whereas in cl. 7.8 & 8 (g) provisions of grooves are mentioned. Please specify the requirement for the same.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
120	Volume-II, cl. 9.1.4: "Live Loads"			**Loads from other utilities & pedestrian:** - It is specified that loads from other utilities & pedestrian should be as per "Design Data", which has not been found, Please specify the same.	Please refer Sr. No. 18 of addendum
121	Volume-II, cl. 9.1.5: "Live Loads"			**Live Loads for Railway portion**: - It is mentioned that for Railway portion loading would be as per IRC: 6-2000 or as approved by Railway authority whichever produces worst effect. Railway special loading, if any, needs to be considered in design; please specify.	IFB conditions shall prevail.
122	Volume-II, cl. 17.2: "Railings, Parapet, crash barriers & median verge"			**RCC & sand filling Median, DWC Pipes etc**.:-It is mentioned that RCC & sand filling Median, DWC Pipes 4 nos., interlocking blocks, bitumen pad in expansion gap etc. should be as per tender drawing. Please provide the drawing.	Please refer Sr. No. 18 of addendum.
123	Volume-II, cl. 25.8.1: "Acceptance Criteria for Load Test"			**Acceptance Criteria for Load Test** :-It is mentioned in the Table that Maximum deflection allowed (both for RCC & PSC type of Bridges) is 40l2x106/d, where, l= length of span in mm. Hope it should corrected as 40l2/d, where, l=length of span	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				in m. Please clarify.	
124	Volume-II, cl. 11.1: "Durability – Grade of Concrete", Volume-IV, Drawings- "General Notes"			**Minimum Grade of Concrete:**-It is mentioned in cl. 11.1 of Vol-II that Minimum Grade of Concrete for superstructure should be M 45, whereas in General Notes of Drawings (Vol-IV), it is mentioned that Minimum Grade of Concrete for superstructure should be M 50. Similarly, Minimum grade of Concrete for foundation is mentioned M 30 in Volume II, whereas M35 in General Notes drawing. Please clarify	Please refer Sr. No. 18 & 19 of addendum

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
125	Volume-IV, Drawings- "GAD for flyover/viaduct portion from Pawana river upto ROB (Component no. 2) & General arrangement for Railway span, elevation & section (Component no. 3)"			**Pier locations of P18-P19-P20 in obligatory span over ROB:**- Pier locations of P18-P19-P20 in obligatory span over ROB are not matching in the drawings of "GAD for flyover/viaduct portion from Pawana river upto ROB (Component no. 2) & General arrangement for Railway span, elevation & section (Component no. 3)". Please clarify.	Please refer Sr. No. 19 of addendum.
126	Volume-II, cl. 2: "Restrictions on type of Structures			**Restrictions on type of Structures: -** In the design built lump sum contract, if the designers want to make an economic design following all the statutory codal requirements, whether there is any restriction in design parameters or alignment? Please clarify.	IFB conditions shall prevail.
127	Vol I/Section Sec III/Pg 53			**Key Personnel: -** Requested to replace the qualification criteria by Diploma in Civil	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
	Table 2.5			Engg with suitable experience.	
128	Vol I/Section Sec III/Pg 54 Table 2.5			**Minimum no of equipment Concrete pumps 30cu/hr-4 Nos Transit mixer (6cum) -10 Nos Aggregate Crushing plant120TPH – 1 No:-** Requested to replace by Concrete pumps 30cu/hr-3 NosTransit mixer (6cum) -6 Nos Aggregate Crushing plant120TPH – Nil	IFB conditions shall prevail.
129	Vol III/Section 1000			**Reinforcement to be provided with anticorrosive treatment as per Railways specification and requirement:-** Please furnish details of the specifications and requirement	IFB conditions shall prevail.
130	Vol II/Cl 2.11			**Details of Pier protection :-** Alternatively to be protected with removable concrete blocks	IFB conditions shall prevail.
131	Vol I/Pg 63-66			**Schedule of payment:-** Requested to revise the Schedule in accordance to the proposed specified limit of payment as percentage of accepted Contract Amount as per Annexure 1 attached to improve the cash flow situation of project	Please refer Sr. No. 2 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
132	Vol I/Pg 74/Sl 1			**Relocation of Utilities:-** Kindly provide us the detailed drawings of utilities to be relocated	Please refer Sr. No. 19 of addendum
133	General			Kindly provide us 4 acres land at suitable location free of cost, to be returned after the construction period in "as it is where it is" condition to facilitate construction activities.	IFB conditions shall prevail.
134	Source of Funds. Vol – I, Page – 8, Clause 2.1 & 2.2			If the bidder is a single Indian entity, whether these clauses are applicable to him. Please clarify this point.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
135	Vol. I, Page 34. ITB 13.1 & ITB 13.2 & 13.4- Alternative Bids			It is stated in above clauses that alternative bids shall not be permitted, alternative times for completion shall not be permitted, and Alternative Technical Solutions shall not be permitted. Considering this is a Lumpsum tender based on Contractors own design and drawing complying to the clients, parameters and requirements, we consider this bid is an alternative bid and alternative technical solutions to be completed with in the stipulated time. It is therefore requested to clarify these points whether you will accept alternative bid based on our own design and drawings complying all the tender stipulations or only a bid based on the tender drawings and designs.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
136	Vol.- I , Page 17, Clause 13.3 – Alternative Bids			In this clause it is specified that first the bidder have to price the Employer's design as described in bid document and shall further provide all information and other details of alternative proposal for evaluation. Only technical aspect of lowest evaluated bidder confirming to basic requirement will be considered. From the above it appears that we have to submit two offers based on Departmental design and drawings for first evaluation and also alternative proposal and bid based on our own design and drawings confirming to the basic requirement for evaluation. Please clarify this point clearly as the lump sum tender is for Design and Construction. It is also requested to specify clearly how the agency should quote for work. All the bidders should have a common base for quoting the price and hence the request.	IFB conditions shall prevail.
137	Vol. I, Page 17 & 34. ITB Clause -14 – Bid Prices and Discounts			What types of discounts are expected to be quoted by the bidder? The discounts to be quoted on account of which items and the details of the same may be made clear.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
138	Vol. I, Page – 59 to 61, Appendix to Bid (ITB), Table A, B & C			If the bidders are Indian Company, whether these tables are applicable to them?	IFB conditions shall prevail.
139	Vol. I, Page 21 & 35, Format & Signing of Bid			The number of copies to be submitted as stated is three in addition to original. It is also requested to specify that how many copies of alternative bids to be submitted.	IFB conditions shall prevail.
140	Vol. I, Page – 74, Provisional Sums			The details of provisional sums are given in Lump sum amount. However the brakes up of the components are not given. During execution how the payments for these items will be made and if the quantum work exceeds that the provisional sums, how the, additional amount will be paid for executing additional work.	Please refer Sr. No. 20 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
141	1. Vol. I, Page 36, I.T.B. 34.2 (a)- Bid evaluation & Comparison			It is stated that the bid will be evaluated the bid price, excluding provisional sums but including day work item. In this connection it is to clarify the following.a. In schedule of day work the quantities are given as nominal quantity. If the quantity is increased during execution, day work amount quoted also will vary. In view of this for evaluation only quoted price excluding provisional items and day work items may be considered.b. Under Day work Summary it is stated that carried forward to bid summary P. where as the Bid submission sheet given in Volume I, page 58 does not show bid summary. Bid summary sheet is not seen in the tender and hence requested to specify the Page No. & volume.c. The discounts offered and the methodology for their applications as stated in bid submission sheet is on which account. This may be explained in details with reference to tender clauses.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
142	1. Vol. I, Page 49, Clause 2.4.2 Specific Experience			The Specific experience stated under clause 2.4.2 (a) and clause 2.4.2 (b) I,II, III, IV, & V are mandatory requirement for single Entity or either of clause 2.4.2 (a) or 2.4.2 (b) will be enough. This may be clarified	IFB conditions shall prevail.
143	Vol. I, Page – 54, Equipments			Automatic Concrete Weigh Batching Plants of capacity 60T/Hr required 2 Nos, One RMC Plant of 60T/hr and 2 RMC Plants of 30T/hr also may be accepted. It is also requested to clarify whether the machineries specified under this clause are required in ownership or can be taken on Hire / Lease.	IFB conditions shall prevail. IFB conditions shall prevail.
144				The date of submission of bid may be extended at least by 3 weeks after the issue of pre – bid meeting minutes.	Please refer Sr. No. 15 of addendum.
145				We presume that the founding level given on page 38 of Vol. II of tender document is inclusive of socketing of piles in rock. Please confirm.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
146				We presume that the spacing of piers shown in drawing is the minimum spacing permitted and contractor is free to chose the span larger than those shown in drawings	IFB conditions shall prevail.
147				Please provide us the softcopy of drawings in AutoCAD format.	Please refer Sr. No. 19 of addendum.
148				We price adjustment clause asked for FIDIC conditions clause 13.8. for filling format A of the appendix the values of b,c,d & e and categories may be specified so as to have uniformity for competition	IFB conditions shall prevail.
149				The work includes Construction of ROB. It is requested to clarify the following points in this connection i. Whether G.A.D. of the proposed R.O.B. is approved by Railway? Whether permission to carry out work in Railway portion obtained from Railway Board as per Prevailing rules ii. Whether, all the payments and deposits etc to be made to Railways will be paid by	IFB conditions shall prevail. All the payments and deposits related to work of ROB shall be borne by the

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				the PCMC iii. Proof Checking charges for Railway Portion if paid by the agency will be reimbursed to them by PCMC? iv. Whether, the execution of work under Railway Portion is to be carried out under supervision of railway and the expenses involved in providing, Transport and other facilities demanded by Railway Authorities will be re-imbursed to the agency? v. For the delay caused on account of Railway Deptt., how the agency will be compensated?	bidder. Proof Checking charges for ROB Work shall be borne by the bidder. All the payments and expenses related to work of ROB shall be borne by the bidder. IFB conditions shall prevail.
150				1. Page No.22 Vol.II - Component 9 – Scope for connecting service roads to 12 m DP road in front of proposed City Center is not clear. May please be clarified.	Please refer Sr. No. 18 of addendum.
151				Page No. 21, 22 Vol.II, Drawing - Width of Staircase may please be clarified	Please refer Sr. No. 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
152				Page No.38 Vol.II – Pile foundation is specified for ramp in Empire Estate area but open foundation is suggested for main bridge at the same location. However in drawing it is shown as open foundation for both. Please clarify	Please refer Sr. No. 18 of addendum.
153				Page No.45 Point No.4.4 Vol.II – Span arrangement shall remain unchanged - Alternative span arrangement may be allowed for spans other than Obligatory Spans & ROB portion.	IFB conditions shall prevail.
154				Page No.208 clause No.2300 Vol.III – Only following type of superstructure shall be allowed. Superstructure for non obligatory span shall be only with precast / prefabricated / elements in pre / post tensioned Box / Prestressed concrete superstructure with closed soffit. Cast –in-situ is permitted only viaduct portion curved in plan. Cast –in-situ may be allowed for total viaduct portion	Please refer Sr. No. 7 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
155	PRICED BILL OF QUANTITIES – Vol.I, Pg. 16 & 17, Cl. 11.1 (b), 12.1, 14.			It is mentioned that Bid shall comprises complete schedule including Priced Bill of Quantities in accordance with ITB 12 & 14. Your goodself is well aware that the Tender is to be submitted on Lumpsum basis and payment will be made as per percentage mentioned in schedule of payment, we therefore request you that submission of price bill of quantities may not be insisted. Also it is confidential document of each bidder which he may not like disclose.	IFB conditions shall prevail.
156	POWER OF ATTORNEY : Vol.I, Cl 20.3 Pg. 22 & Pg. 35, Cl. ITB 20.2.			Cl 20.3 mentions that a bid submitted by JVA shall comply with Power of Attorney signed by those legally authorized to sign on behalf of the JVA and Cl. ITB 20.2 on Page 35 Vol-I mentions that Notarized Power of Attorney shall be as per the Prescribed Format. However, we did not find any format for Power of Attorney in the tender document. Kindly issue the same.	IFB conditions shall prevail.
157	SPECIFIC EXPIERINCE. Vol.I, Pg. 48, Cl.2.4.2. (a).			As per standard practice, various clients of Govt. & Semi Govt. organization like NHAI, MDRDC, MORTH, CIDCO etc. are adopting the provision of 10% enhance factor to arrive the cost of completed project of	Please refer Sr. No 8 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				previous year to the current price level. Your good self is well aware that PCMC is also adopting the same for other projects. We therefore request you to make the provision of enhance factor of 10% per year to arrive the cost of completed project of previous year to the current price level ie 2010-2011.	
158	BID SUBMISSION SHEET: Vol.I, Pg.57 & 73			It is mentioned on Pg. 76 of Vol.I that the amount of Day work summary to be carry forward to Bid Summery sheet, however in Bid submission sheet Pg. 58 we do not find the separate head for amount of Day works 1 To 3 & Provisional sum of Rs. 41 million. Please clarify	Please refer Sr. No 9 of addendum.
159	SUMMARY OF PAYMENT CURRENCIES. Vol.I, Pg.61			We presume that Table Alternative - A is not applicable for Indian Bidders. Please confirm	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
160	SCHEDULE OF PAYMENT – Vol.I, Pg. 66, Sr. No.35			It is mentioned that the "Payment on account of video shooting, photo album, preparation and final submission of record, drawings, for complete River Bridge, flyover/Viaduct Portion, ROB, approaches and Ramps etc." shall be 3% of accepted Contract Amount. In this context we request you that limit of the payment of 3% of this unit may please be changed to 1% and the remaining 2% may be distributed among the Sr. No. 3, 4, 5 and 6 equally	Please refer Sr. No. 2 of addendum.
161	DAYWORK RATES FOR EQUIPMENT. Vol.I, Pg.72			We presume that rates to be quoted for sub items of D301 and not for the main Item D301. Please confirm. Also kindly furnish the nominal quantity for Item No. D305 as only unit is mentioned	Please refer Sr. No 9 of addendum. Please refer Sr. No 9 of addendum.
162	DAYWORK SUMMERY. Vol.I, Pg.73			We presume that in Days Summery "% foreign "to be quoted is not applicable to the bidders who are quoting in Indian National Rupees. Please confirm	IFB conditions shall prevail.
163	PAYMENT & FEES TO STATUTORY			All fees, deposits, charges required to be paid to Local / Statutory Authorities shall be borne by the client also obtaining permissions, approvals from the concern	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
	AUTHORITIES			authorities is the responsibility of the client	
164	PERMISSIONS, FEES, DEPOSITS FOR SHIFTING OF UTILITIES: Vol.I, Pg. 74			It is mentioned that all necessary permissions for relocation and shifting of utilities such as HT tower line of railway, existing sewer lines and water supply lines, existing HT/LT electrical lines, existing storm water lines, OFC lines etc. will be done by contractor. Your goodself is well aware that substantial time will be required for obtaining permissions from various authorities. We therefore request that all necessary approvals & permissions from the concern authorities shall be the responsibility of the client, which will enable to complete the project in stipulated period. Also all fees, deposits required to be paid to various authorities shall be borne by the Employer	IFB conditions shall prevail. Any fees, deposits etc. required to be paid to the various authorities shall be reimbursed at actual on production of documentary evidence of concerned authorities. This is only for shifting of the utilities considered under Provisional Sum.
165	PERMISSIONS			We would like to highlight regarding the	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
	FROM RAILWAY AUTHORITIES: Vol.I, Pg.74			permissions for the General Arrangement Drawings for ROB to be taken from Railway Dept. It is our experience that the obtaining permissions from Railway Department require substantial time. In view of this, we request you that permissions from Railway Department for GAD & work in ROW of railway portion shall be taken by the Employer. So also all fees, deposits, supervision charges etc. required for the same shall be borne by the Employer	All the payments and deposits related to work of ROB shall be borne by the bidder. Proof Checking charges for ROB Work shall be borne by the bidder. All the payments and expenses related to work of ROB shall be borne by the bidder.
166	PROVISIONAL SUM: Vol.I, Pg.74			It is mentioned that provision of Rs. 41 million are kept as provisional sum for the execution of the items such as Relocation of Utilities such as Water Mains, Sewer lines, Storm Water Lines, Electrical underground cables, High Tension Electrical Tower Line of the Railways and all other underground and over-ground utilities required to be shifted before construction of River Bridge, ROB, Flyover/Viaduct with approaches & ramps. Traffic signals, Landscaping & arboriculture. In this context we presume that items of work will be prepared before execution of	Please refer Sr. No 20 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				the respective items and payment will be made as per actual material + Labour + Machinery + 25% towards contractor's overheads & profit + taxes	
167	BID SECURITY: Vol.I, Pg. 97, Form of Bid Security			We propose to insert the following notwithstanding clause as per RBI guidelines in the format for Bank Guarantee:"Notwithstanding anything contained herein above:a. Our liability under this Bank Guarantee shall not exceed Rs.-------- b. This Bank Guarantee shall be valid up to ---------- c. We are liable to pay the guaranteed amount or any part thereof under this guarantee only if you serve upon us a written claim or demand on or before ----------. Unless a claim or a demand is made against the bank in terms of this guarantee shall be forfeited and we shall be discharged from all liability therein irrespective of whether guarantee is received back by us or not" .Please confirm	IFB conditions shall prevail. RBI Guidelines may be followed.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
168	RA BILL: Vol. I, Pg. 118, Cl. 14.7 & 136, CONTRACT DATA			We request that 75% amount of R.A. bill shall be paid within 7 days & balance within 15 days from the date of submission of R.A. Bill. It is mentioned on Pg. 136, Contract data of Vol.I, that minimum amount of RA bill is INR 30 million. We would like to bring to your kind notice that minimum amount as mentioned may not be possible initially for few month and few months at the end. We therefore request you to pay bills as per actual work done and minimum amount should not be insisted	IFB conditions shall prevail. IFB conditions shall prevail.
169	DEFECT NOTIFICATION PERIOD – Vol – I, Pg.134, Cl. 1.1.3.7			The defect liability period may please be reduced to 730 days	IFB conditions shall prevail.
170	COMPENSATION			If contract period is delayed due to reasons beyond the control of contractor then necessary compensation should be paid to the contractor	IFB conditions shall prevail.
171	METHOD OF MEASUREMEN			It is mentioned that method of measurement for the work done for the	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
	TS - Vol.I, Pg.63 To 66			items mentioned in table shall be as per the provisions in the MORT&H. We suggest that method of measurement as per provisions in the specifications for Road and Bridge Works (latest edition) shall also be accepted	
172	Road Work			We do not found items for road work in adjustment of contract price. We therefore request you to incorporate the items for road work in the same	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
173	NOISE BARRIER			It is mention in Vol. II, Pg. 13 & 15 that noise barrier is to be provided with crash barrier on both side of the individual carriage way at following locations.Location ChainageComponent - 2 3+140 3+616Component - 4 3+653.20 4+110Component - 4 4+110 4+175 In this context being a new concept to India, we approached to the agencies and we found that this is a very specialized item and rates vary substantially with respect to the type and specifications. We therefore request you to furnish the following details to have a common platform being a lumpsum Tender. a. Detailed Technical specifications. b. Type of noise barrier to be provided. c. Height of the barrier. d. Fixing arrangement. Also specify the nominated agencies	Please refer Sr. No 18 of addendum. Please refer Sr. No 4 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
174	RETAINING WALL : COMPONENT 3, Vol.II, Pg. 9 & 15.			It is mentioned that Retaining Wall on one side is to be constructed for retaining the existing slope of the track for the required length along the rail line on Pune Mumbai within ROW" as shown in GAD, however we do not find the same in GAD. We therefore request you to furnish the details ie length, cross section, grade of concrete etc. During our site visit, we observed there is existing retaining wall towards Empire Estate. We feel this is required to be demolished for construction activity, we therefore presume that the existing retaining wall should be dismantled and reconstructed and payment for the same shall be made by PCMC.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
175	1. PORTAL FRAMES: Vol. II, Pg. 45, Cl. 4.2 (p).			It is mentioned that "It is obligatory to construct Portal Frames Substructure for pier No P5, P6, P7, P8, P9 & P14, P15, P16 on Left side of Flyover/Vladuct as shown in the GAD, however alignment drawing of component 2 indicates that column of portal P 5 to P 9 comes exactly over boundary of ROW, hence foundation of this column will go beyond the ROW. You are therefore requested to allow the construction of Pier instead of Portal from P5 to P9	IFB conditions shall prevail.
176	DRAWING – COMPONENT NO. 4, 5, 6			Kindly furnish the detailed cross section for sub and superstructure showing viaduct details for component 4, 5, 6. Also 'L' section for component 5 & 6 indicates piers R21 to R34, however in alignment plan on same drawing the piers R21 to R34 are not reflecting and coincides. Please confirm.	Please refer Sr. No 19 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
177	DRAWING – COMPONENT NO. 1			It is indicated on drawing that abutment is with box type for A1, however we request you to permit the construction of abutment with solid / RE Wall. Also it is indicated abutment A2/PP4 on drawing; however we do not find A2 on the drawing. We therefore presume that abutment A2 is not required as Pawana River Bridge is in continuation with Flyover.	IFB conditions shall prevail. Please refer Sr. No 19 of addendum.
178	ALL DRAWINGS			As per cross section showing storm water, drainage line for service lane on both side of the flyover and ramps, we presume that this is not in the present scope of work as we do not find the details of same in the document. If it is in the scope of work kindly furnish the details such as length, crust etc	Please refer Sr. No 18 & 19 of addendum.
179	CONCRETE GRADES			Grade of concrete mentioned in Vol.II, Pg. 53, Cl. No.11 and Vol.IV – Drg. No. PCMC/KALEWADI/GN/01 are differs. Please confirm.	Please refer Sr. No 19 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
180	FOUNDATION TYPE & RAMPS ON BOTH SIDE OF FLYOVER – COMPONENT - 2. Vol.II, Pg. 38, Sr. No. 18			It is mentioned that pile foundation for ROB and flyover from Pawana River to ROB & Ramps on both side of this flyover; however in GAD we dot find the Ramps in between Pawana River to ROB. Please confirm. Drawing for component – 2, 'L' Section indicates pile foundation, however on same drawing cross section of flyover with bus stop indicates open foundation. Please confirm.	Please refer Sr. No 18 of addendum.. Please refer Sr. No 19 of addendum.
181	FINISH ROAD LEVEL (FRL).			Kindly furnish the Finish Road Level (FRL) being a lump sum contract, as we do not find the same in tender document	Please refer Sr. No 19 of addendum.
182	PARAPET/GUARD RAIL			It is indicated on the drawing 1200 mm wall to be provided on outer side of the each carriage way. We presume that same is parapet/guard rail. Kindly provide the details including cross section.	Please refer Sr. No 19 of addendum.
183	KERB			Kindly furnish the dimensions of the Kerb	IFB conditions shall prevail.
184	BUS SHELTER			Kindly furnish the detailed drawing & specifications for Bus Shelter	Please refer Sr. No 18 &19 of addendum. Copy of the same. The work of Escalators, Lifts and Bus Stops/Shelters has been deleted from the scope.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
185	STAIRCASE – COMPONENT 8, Vol.II, Pg. 21			It is mentioned that 4 units of staircases are to be provided for ascending & descending units for pedestrians, however on Pg.40 it is mentioned 3 units of dog legged staircase having 2 m clear width. We therefore request you to provide correct numbers of staircases to be provided along with detailed drawing and locations of the same as we do not find the same on GAD	Please refer Sr. No 18 of addendum.
186	PAVER BLOCKS FOR PEDESTIAN FOOT PATH			Kindly specify the thickness, grade, colour & strength of paver block.	IFB conditions shall prevail.
187	LANDSCAPING & ARBORICULURE. Vol.II, Pg.13,16 Component 2 & 4.			It is mentioned that paving with paver block under the flyover for parking and landscaping cum arboriculture, we presume that same shall be paid under provisional sum mention in Vol.I, Pg. 74, Sr. No.3	Please refer Sr. No 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
188	COMPONENT. Vol.II, Pg. 22			It is mentioned following. a. Construction /Improvement of service roads of Pune Mumbai road and Connecting service road to the ramps in the Empire Estate Area and 12 m DP Road in front of proposed City Centre. b. Construction of footpaths with Paver blocks. c. Landscaping and Arboriculture. In this context we request you to furnish the service road details ie length, crust etc. also area of paving block. We presume that Landscaping & Arboriculture work shall be paid under provisional sum mentioned in Vol.I, Pg. 74, Sr. No.3	Please refer Sr. No 18 of addendum.
189	SITTING ARRANGEMENT. Vol.II, Pg.24, COMPONENT 10			It is mentioned that supply and installation of decorative sitting arrangement in the landscape area at least at 10 suitable locations, we presume that same shall be paid under provisional sum mention in Vol.I, Pg. 74, Sr. No.3.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
190	DESIGN DATA Vol.II, Pg. 27, 37			Carriageway widths mentioned in design criteria do not match with width mentioned on drawing.	Please refer Sr. No 18 of addendum.
191	BITUMEN GRADE Vol.II, Pg. 28			It is mentioned that grade of bitumen 30/40 for DBM & BC, we request you to allow 60/70 grade	Please refer Sr. No 18 of addendum.
192	1. OVERHEAD GANTRY Vol.II, Pg. 23, 24 & 32.			The numbers mentioned on Pg. 23 & 24 are six numbers; however on Pg. 32 it is mentioned 3 numbers. Please confirm.	Please refer Sr. No 18 of addendum.
193	MINIMUM SPAN LENGTH Vol.II, Pg. 41			It is mentioned that minimum length of flyover shall not less than 25m, however some of the spans shown on GAD are 22/23m. Please confirm.	Please refer Sr. No 18 of addendum.
194	HEIGHT OF EMBANKMENT Vol.II, Pg.44, Cl. 4.2 (b)			It is mentioned that height of embankment at abutment location shall not be more that 4.5m, however height of embankment for the abutment of Pawana River is more than 4.5 m as per levels mentioned on drawing.	Please refer Sr. No 18 of addendum.
195	CEMENT Vol.III, Pg. 181			It is mentioned that cement to be procured from the manufacturers ACC/Gujarat Ambhuja /L&T. We request you to accept any other equivalent makes other than	Please refer Sr. No 10 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				mentioned above.	
196	REINFORCEMENT			It is mentioned on Drawing. No.PCMC/KALEWADI/GN/01, reinforcement steel shall be of Fe 500, however in Vol.II, Pg. 53, Cl.11.3 it is mentioned that the Fe 500 TMT/CRS steel shall be used. Please confirm.	Please refer Sr. No 11 of addendum.
197	DATA & DESIGN CRETERIA FOR STRUCTURES Vol.II – Pg.37.			i. TEMPERATURE RANGE: Cl. I (i) Sr. No. 9. It is mentioned on Sr. No. 9, Temperature range is 0° To 47° C, however as per code it is ± 25° C.	IFB conditions shall prevail.
	I . DESIGN DATA FOR STRUCTURES Vol.II – Pg.37			ii. HIGH FLOOD LEVEL: Cl. I (i) Sr. No. 11 (i). It is mentioned that 1.5 M free board over HFL of river Pavna. We request you to provide Affluxes HFL RL of river Pavna.	Please refer Sr. No 18 of addendum.
				iii. PILE FOUNDATION: Pg.49, Cl. 6.3.3 (5). It is mentioned that pile foundation with minimum 1200mm Diameter; however as per amendment of June 2009 minimum diameter of pile is 1000 mm for bridges and 750 mm Diameter for land spans.	Please refer Sr. No 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				iv. LIVE LOAD Kindly furnish the live load to be considered for design of flyover/bridge for footpath / Cycle track & BRTS lane.	IFB conditions shall prevail.
				v. ESCALATOR/LIFT : Vol.II, Pg. 40, iii, Sr. No. 1 (a) (c). We request you to accept any other equivalent makes other than mentioned in the Tender. vi.ESCALATOR: It is mentioned on Pg. 133 of Vol.III, that angle of inclination to the horizontal is 30°, however in in Vol.II, Pg. 40 mentioned 35°. Please clarify. Kindly specify the vertical rise for escalator.	The work of Escalators, Lifts and Bus Stops/Shelters has been deleted from the Scope.
198	DESIGN CRETERIA FOR STRUCTURES Vol.II - Pg. 41 & 50			a. DECK CONTINUITY: Cl. II, 1, (iv) & (V) & 8 (c). It is mentioned that at the time of detailed design the contractor shall not deviate from the basic scheme and employer's requirement & the superstructure shall have minimum number of expansion joints for better riding surface. In this context, we inform your good self that we will use IRC-SP 66 for deck continuity arrangement. Please confirm.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				b. BASE PRESSURE: Vol.II- Pg. 47, Cl. II, 6.1.3. Criteria of maximum pressure for open foundation is given, however for pile foundation same is not given. We therefore presume that pile capacity shall be worked out as per latest IRC codes as per Amendment in June 2009.	IFB conditions shall prevail.
				c. CHECKING OF STRESSES: Vol.II, Pg. 47, Cl. II, 6.1.6. It is mentioned that while checking the stresses at the base of foundations it shall be ensured that under the worst combination of forces there is no tension. We presume that this is applicable for open as well as pile foundation. Please confirm.	Please refer Sr. No 18 of addendum.
				d. PILE FOUNDATION: Vol.II, Pg.47, Cl. II, 6.3.1.It is mentioned that the pile foundation shall be designed considering various load combination forces and permissible stresses as per the latest edition of IRC 78. We presume that latest edition of IRC 78 with June 2009 Amendment shall be used. Please confirm.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				e. PILE CAPACITY: Vol.II, Pg. 48, Pg. 48, Cl.II,6.3.2(1). We presume that pile capacity in rock shall be calculated as per IRC 78 latest edition with June 2009 Amendment. Please confirm	IFB conditions shall prevail.
				f. RMR VALUE. Vol.II, Pg. 48. Cl.6.3.2 (1). It is mentioned in design criteria for pile foundation, RMR value more than 70 which seems to be very much on higher side. We request you to reduce the same considering the quality of rock in Pune. Also safe bearing capacity shall not be co-related with RMR value. Please confirm	Please refer Sr. No 18 of addendum.
				g. DESIGN OF PILES: Vol.II, Pg. 48, Cl. II, 6.3.2 (3). The piles shall be designed as fixed end bearing. Fixity shall be considered at the top of rock where the socketing begins and at the center of pile cap. Side friction from G.L. up to embedment level shall not be considered for design. Support from surrounding strata shall not be considered for design of piles. In this context, we request you this may not be applicable as this criteria is not necessary	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				for land bridges.	
				h. PILE CAPACITY: Vol.II, Pg. 48, Cl. II, 6.3.3 (1). It is mentioned that 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. In this context we bring to your notice that it is now permitted in IRC 78 with June 2009 Amendment.	IFB conditions shall prevail.
				i. DEFLECTION: Vol.II, Pg. 49, Cl. II, 6.3.3 (2). It is mentioned that the lateral Load carrying capacity of pile shall be assessed by carrying out lateral load test on a single pile for a deflection of 5 mm at top. We bring to your notice that it is now 1% of pile diameter i.e. 12mm for 1200 mm pile. Please confirm.	Please refer Sr. No 18 of addendum.
				j. INTERMEDIATE DIAPHRAGM: Vol. II, Pg. 54, Cl. II, 12.2. It is mentioned that minimum thickness of intermediate diaphragm provided shall be 300 mm and end diaphragm shall be 500 mm. We request you not to insist on intermediate	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				diaphragm.	
				k. ANTICORROSIVE TREATMENT TO PILE FOUND.FOR ROB: Vol. II, Pg. 48, Cl. 6.3.1 (a).It is mentioned that anticorrosive treatment for the piles in the ROB portion at pier locations PL26, PL27, PR28 & PR29. In this context we bring to your kind notice that as per GAD drawing for component 2 indicates PL 18, PL19, PL20, PR18,PR 19 & PR 20, however as per GAD drawing for component 3 indicates PL19, PL20,PL21, PR19, PR20 & PR21 and as per GAD drawing, PL19, PR19, PL21, PR21 are outside the railway boundary. We therefore request you to specify the exact Pier Nos.	Please refer Sr. No 18 of addendum.
199	OCTAGONAL POLE, Vol.III Pg. 42,46, Cl. 4 & 11.1			The height of octagonal lighting pole is 10mtr.as mentioned on Pg. No. 42, however on Pg. No.46 height is mentioned as 9mtr. Please clarify.	Please refer Sr. No 12 of addendum.
200	Vol. III, Pg. No. 43,46, Cl. 7 & 11.1			The street light fixtures are 250W SON - T type as mentioned on Pg. No – 43, however on Pg. No. 46, 250W Metal Hallide lighting fixtures are mentioned. Please clarify.	Please refer Sr. No 13 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
201	SUBMISSION:			Tender is to be submitted on lump sum basis and therefore voluminous work is involved such as preparing drawing & design, working out quantities, getting quotations for specialized items, rate analysis, site investigation etc. We, therefore request you to extend the date of submission minimum upto 4 weeks after all the clarifications are given in writing, so that we shall be in a position to submit most competitive tender. This will be in the best interest of the project & client	Please refer Sr. No 15 of addendum.
202	Volume I Page 32		Bid Data sheet	Price Variation Clause seems to be missing. Since the time period is of 30 months, there will bound to have variation in the pieces of labour, fuel, materials etc during contract period. Also star rate for materials viz- Cement, HYSD reinforcement steel, MS plates & structural steel, HT steel & Bitumen for calculation of price escalation are also not furnished. Please confirm.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
203	Volume I Page 12		Bridge on Pawana River	Two carriageways of 14.50 m each is mentioned. Overall width is shown as 29900 in the Drg with vol IV. Considering width of crash barriers, central verge this is not matching. 14.50 m seems to be overall width of each half. Please confirm. Similar is with the RE portion also for 13.15 m each carriageway. Kerbing width at the end of 3500 m lane either side of central verge is not shown. Please confirm.	Please refer Sr. No 18 & 19 of addendum.
204	Volume II page 12		The details of work involved in component 1 : Road furniture	Please furnish quantity of sign & cautionary boards in numbers/sq.m., number of overhang cantilever signs & OH gantry.	IFB conditions shall prevail.
205	Volume II page 12		The details of work involved in component 1 : Tree cutting	Please give quantity/number of trees to cut, plant, and transplant.	IFB conditions shall prevail.
206	Volume II Page 13		Continuous flyover / viaduct form Pawana river to ROB	Please confirm on similar lines at sr. no. 2 above for carriageway width/ overall width for 13.45 m. each.	Please refer Sr. No 18 & 19 of addendum.
207	Volume II page 13		The details of work involved in component 2 :- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
208	Volume II page 13		The details of work involved in component 2 :- Rehabilitation, repair, re-construction.	Please give the quantity/ area in sq.m. with composition of each activity i.e. Rehabilitation, repairs, re-construction & maintenance for existing road to consider for bidding being L.S. bid.	Please refer Sr. No 18 of addendum.
209	Volume II page 13		The details of work involved in component 2 :- Clearing the existing corridor.	Please give the quantity/ area in sq.m. of encroachment area to be cleared. It is considered that relocation of encroachment mentioned is not part of scope of work & will be completed by PCMC prior to handing over the site for execution. Please confirm.	IFB conditions shall prevail.
210	Volume II Page 14		The details of work involved in component 2: Tree cutting..	As similar to sr. no. 4 above.	IFB conditions shall prevail.
211	Volume II Page 14		Rob on central Mumbai - Pune Railway line	1. The GAD attached with the volume IV for ROB is assumed to be already having approval from the Central Railway since it is the requirement of Railway department.	IFB conditions shall prevail.
212				2. Any charges towards supervision of railway department, traffic or power block, approvals to design if required in railway area after proof checked & approved by the Engineer/ Client etc are not to be covered	IFB conditions shall prevail. All the payments and deposits related to work of ROB shall be borne by the bidder. Proof Checking charges for ROB Work shall be borne by the

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
				under the contract & will be borne by the PCMC as required. Please confirm.	bidder. All the payments and expenses related to work of ROB shall be borne by the bidder.
213				3. Any delay on account of getting permissions, approvals, payment of charges/fees to railway department by PCMC, etc will be compensated in relation with the completion of project as a whole as applicable. Please confirm.	IFB conditions shall prevail.
214				4. Please confirm on similar lines at sr. no. 2 above for carriageway width/ overall width for 15.30 m. each.	Please refer Sr. No 18 of addendum
215	Volume II Page 14		The details of work involved in component 3 :- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
216	Volume II Page 15		The details of work involved in component 3 :- Rehabilitation, repair, re-construction.	As similar to sr. no. 7 above.	Please refer Sr. No 18 of addendum.
217	Volume II Page 15		The details of works involved in component 3: Clearing the existing	As similar to sr. no. 8 above.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			corridor		
218	Volume II Page 15		The details of work involved in component 3: Tree cutting	As similar to sr. no. 4 above.	IFB conditions shall prevail.
219	Volume II Page 15		The details of work involved in component 3 :- Construction of retaining wall..	Please furnish the length & height of retaining wall as proposed since not clear in drawing / GAD in vol IV.	Please refer Sr. No 18 & 19 of addendum.
220	Volume II Page 15		Continuous flyover/viaduct from ROB to crossing of NH4	Please confirm on similar lines at sr. no. 2 above for carriageway width/ overall width for 11.65 m & 13.45 m. each & also for RE wall 13.45 m & 13.15 m.	Please refer Sr. No 18 of addendum.
221	Volume II Page 15		The details of work involved in component 4 :- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
222	Volume II Page 16		The details of work involved in component 4 :- Rehabilitation, repair, re-construction…	Please give the quantity/ area in sq.m. with composition of each activity i.e. Rehabilitation, repairs, re-construction & maintenance for existing road to consider for bidding being L.S. bid.	Please refer Sr. No 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
223	Volume II Page 16		The details of work involved in component 4 :- Clearing the existing corridor…	Please give the quantity/ area in sq.m. of encroachment area to be cleared. It is considered that relocation of encroachment mentioned is not part of scope of work & will be completed by PCMC prior to handing over the site for execution. Please confirm.	IFB conditions shall prevail.
224	Volume II Page 16		The details of work involved in component 4: Tree cutting	As similar to sr. no. 4 above.	IFB conditions shall prevail.
225	Volume II Page 17		Descending Ramp …. Ramp 1 (left)	Please confirm on similar lines at Sr. no. 2 above for carriageway width/ overall width for 5.05 m.	Please refer Sr. No 18 of addendum.
226	Volume II Page 17		The details of work involved in component 5 :- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
227	Volume II Page 17		The details of work involved in component 5 :- Rehabilitation, repair, re-construction…	As similar to sr. no. 7 above.	Please refer Sr. No 18 of addendum.
228	Volume II Page 17		The details of work involved in component	As similar to sr. no. 8 above.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			5 :- Clearing the existing corridor…		
229	Volume II Page 18		The details of work involved in component 5: Tree cutting	As similar to sr. no. 4 above.	IFB conditions shall prevail.
230	Volume II Page 18		Descending Ramp …. Ramp 2 (Right)	Please confirm on similar lines at Sr. no. 2 above for carriageway width/ overall width for 5.05 m.	Please refer Sr. No 18 of addendum.
231	Volume II Page 18		The details of work involved in component 6:- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
232	Volume II Page 19		The details of work involved in component 6 :- Rehabilitation, repair, re-construction…	As similar to sr. no. 7 above.	Please refer Sr. No 18 of addendum.
233	Volume II Page 19		The details of work involved in component 6 :- Clearing the existing corridor	As similar to sr. no. 8 above.	IFB conditions shall prevail.
234	Volume II Page		The details of work	As similar to sr. no. 4 above.	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
	19		involved in component 6 :- Tree cutting..		
235	Volume II Page 20		Descending Ramp. Ramp 3 (Left)	Please confirm on similar lines at sr. no. 2 above for carriageway width/ overall width for 8.40 in.	Please refer Sr. No 18 of addendum.
236	Volume II Page 20		The details of work involved in component 7:- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
237	Volume II Page 20		The details of work involved in component 7 :- Rehabilitation	As similar to sr. no. 7 above.	Please refer Sr. No 18 of addendum.
238	Volume II Page 20		The details of work involved in component 7 :- Clearing the existing corridor.	As similar to sr. no. 8 above.	IFB conditions shall prevail.
239	Volume II Page 20		The details of work involved in component 7 :- Tree cutting…	As similar to sr. no. 4 above.	IFB conditions shall prevail.
240	Volume II Page 21		Pedestrian Facility.	Please confirm number of stair cases & escalators & lifts to be provided at each bus stop location	Please refer Sr. No 18 & 19 of addendum. The work of Escalators, Lifts and Bus

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
					Stops/Shelters has been deleted from the scope.
241	Volume II Page 22		Construction / Improvement to the…		IFB conditions shall prevail.
242	Volume II Page 22		The details of work involved in component 9 :- Road furniture	As similar to sr. no. 3 above.	IFB conditions shall prevail.
243	Volume II Page 22		The details of work involved in component 9 :- Rehabilitation, repair, re-construction.	As similar to sr. no. 7 above.	Please refer Sr. No 18 of addendum.
244	Volume II Page 22		The details of work involved in component 9 :- Clearing the existing corridor...	As similar to sr. no. 8 above.	IFB conditions shall prevail.
245	Volume II Page 23		The details of work involved in component 9 :- Tree cutting…	As similar to sr. no. 4 above.	Please refer Sr. No 18 of addendum.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
246	Volume II Page 23		The details of work in component 9 : Landscaping and arboriculture	Please furnish the area in sq. m to be consider in this activity	Please refer Sr. No 18 of addendum.
247	Volume II Page 23		The details of work involved in component 9 :- Removal & reconstruction of concrete	Please furnish the area in sq.rn. to be consider in this activity.	Please refer Sr. No 18 of addendum.
248	Volume II Page 24		Road Making, signage and road furniture	Whether these items are in addition to similar items in each component above? Please confirm	IFB conditions shall prevail.
249	Volume II		Traffic diversion and management	Whether these items are in addition to similar items in each component above? Please confirm	IFB conditions shall prevail.
250	Volume II		Street lighting and electric supply for various installation	For required power supply connection from MSEDCL to PCMC related to this project it is including deposits if any is not to covered under lump sum cost and will be dealt by PCMC, Please confirm	IFB conditions shall prevail. Necessary Charges for functioning of street lights after completion of work shall be borne by Employer.
251	Volume II		Land for Batching plant, fabrication yard,	It is considered that PCMC will give the sufficient size of land for said purpose for	IFB conditions shall prevail.

Sr.No.	Clause No. / Item No.	Vol. & Page No.	Clause In Tender	Text of Questions (Query / Request) of Bidder	Response (Clarifications)
			casting yard, labour camp, site office, site store etc.	construction period for free of cost at near vicinity of the site Please Confirm	
252	Volume II		Disposal of excavated, clearing of encroachment materials etc.	It is considered that PCMC will give the sufficient size of land for said purpose with minimum lead from the site. Please confirm	IFB conditions shall prevail.
253	Volume II		Tree plantation and transplantation	It is considered that PCMC will give the sufficient size of land for said purpose with minimum lead from the site. Please confirm	IFB conditions shall prevail.
	GENERALPOINTS		Statutory Charges	During construction period any increase in taxes, duties or imposition of any new taxes/duties/VAT by local authority, state government or central govt. after the date of submission of tender shall be suitably compensated to the contractor	IFB conditions shall prevail.
			Liquidated Damages	We request you to reduce the maximum LD as 5% instead of 10% mention	IFB conditions shall prevail.
254				Request for providing data of LWL of River & related data.	Please refer Sr. No 18 & 19 of addendum.

ADDENDUM TO BID DOCUMENT

Addendum to Bid Documents (This shall form part of Bid Document)

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
1	Section IV Bidding Forms	Volume I Page No 55	Section IV. Bidding Forms Table Of Forms Bid Submission Sheet 59 Appendix to Bid 61 Table A. Local Currency 61 Table B. Foreign Currency (FC) 62 Table C. Summary of Payment Currencies 63 Bill of Quantities Error! Bookmark not defined Bill No 1: General Items Error! Bookmark not defined Bill No 2: Earthworks Error! Bookmark not defined Bill No 3: Culverts & Bridges Error! Bookmark not defined Schedule of Daywork rates : 1. Labour 69 Schedule of Daywork rates : 2. Materials 73 Schedule of Daywork rates : 3. Contractor's Equipment 74 Daywork Summary 75 Summary of Specified Provisional Sums 76 Grand Summary Error! Bookmark not defined Technical Proposal 77 Site Organization 78 Method Statement Error! Bookmark not defined Mobilisation Schedule 81 Construction Schedule Form EQU : Equipment 82 Form EQU : Equipment 83 Personnel 84 Form PER : 1 Proposed Personnel 84 Form PER :2 Resume of proposed personnel 85 Bidders Qualification following Prequalification Error! Bookmark not defined	Section IV. Bidding Forms Table Of Forms Bid Submission Sheet 57 Appendix to Bid 59 Table A. Local Currency 59 Table B. Foreign Currency (FC) 60 Table C. Summary of Payment Currencies 61 Schedule Of Payment 63 - 66 Table for Adjustment of Contract price 67-69 Deleted Deleted Schedule of Daywork rates : 1. Labour 70 Schedule of Daywork rates : 2. Materials 71 Schedule of Daywork rates : 3. Contractor's Equipment 72 Daywork Summary 73 Summary of Specified Provisional Sums 74 Deleted Technical Proposal 75 Site Organization 76 Method Statement 78 Mobilisation Schedule 79 Construction Schedule Form EQU : Equipment 80 Form EQU : Equipment 81 Personnel 82 Form PER : 1 Proposed Personnel 82 Form PER :2 Resume of proposed personnel 83 Deleted

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			Form ELI - 1: Bidder Information Sheet Error! Bookmark not defined	Deleted
			Form ELI - 2: JV Information Sheet Error! Bookmark not defined	Deleted
			Form CON – 2: Historical Contract Non-Performance Error! Bookmark not defined	Deleted
			Form FIN-1: Financial Situation Error! Bookmark not defined	Deleted
			Form FIN-2: Average Annual Construction Turnover Error! Bookmark not defined	Deleted
			Form FIN-3: Financial Resources Error! Bookmark not defined	Deleted
			Form FIN-4: Current Contract Commitments / Works in Progress Error! Bookmark not defined	Deleted
			Bidders Qualification Without Prequalification 87	Bidders Qualification Without Prequalification 85
			Form ELI -1 :- Bidders information Sheet 88	Form ELI -1 :- Bidders information Sheet 86
			Form ELI- 2 :- JV information Sheet 89	Form ELI- 2 :- JV information Sheet 87
			Form CON- 2 :- Historical Contract Non-Performance 90	Form CON- 2 :- Historical Contract Non-Performance 88
			Form FIN -1 :- Financial Situation 91	Form FIN -1 :- Financial Situation 89
			Form FIN -2 :-Average Annual Construction Turnover 92	Form FIN -2 :-Average Annual Construction Turnover 90
			Form FIN -3 :- Financial Resources 93	Form FIN -3 :- Financial Resources 91
			Form FIN -4 :- Current Contract Commitments/ Work In progress 94	Form FIN -4 :- Current Contract Commitments/ Work In progress 92
			Form EXP -1 :- General Construction Experience 95	Form EXP -1 :- General Construction Experience 93
			Form EXP -2(a) :- Specific Construction Experience 96	Form EXP -2(a) :- Specific Construction Experience 94
			Form EXP -2(b) :- Specific Construction Experience in Key Activities 97	Form EXP -2(b) :- Specific Construction Experience in Key Activities 95
			Form of Bid Security 98	Form of Bid Security 96
			Form of Bid-Securing Declaration Error! Bookmark not defined	Deleted

<table>
<tr><th>Sr. No.</th><th>Clause No. / Item No.</th><th>Vol. & Page No.</th><th>Clause in the Bid Document</th><th>Amended Clause of the Bid Document</th></tr>
<tr><td>2</td><td>Section IV Bidding Forms</td><td>Volume I Page No 63,64,65 & 66</td><td>
SCHEDULE OF PAYMENT
The Bidder shall submit his price bid in the bid submission sheet. The interim Payment certificates shall be approved after completion of units & paid as per Schedule of Payment described below.
<table>
<tr><th>Unit No.</th><th>Units for Payment</th><th>Specified limit of payment as percentage of accepted Contract Amount</th></tr>
<tr><td>1</td><td>Payment on account of providing appropriate road barricading and traffic safety devices.</td><td>0.25%</td></tr>
<tr><td>2</td><td>Payment on account of construction of site office and laboratory.</td><td>0.25%</td></tr>
<tr><td>3</td><td>Initial payments against visible assets viz. Casting Yard and Batching Plants on the site</td><td>0.50%</td></tr>
<tr><td>4</td><td>Survey, Geotechnical investigation of entire structure/project.</td><td>1.00%</td></tr>
<tr><td>5</td><td>Payment on submission of design and initial approval of design & drawing by the Employer.</td><td>1.00%</td></tr>
<tr><td>6</td><td>Payment on submission of design and drawing for final approval.</td><td>1.00%</td></tr>
<tr><td>7</td><td>Payment for all foundations of River Bridge on Pawana</td><td>1.25%</td></tr>
<tr><td>8</td><td>Payment for all sub-structure of</td><td>1.00%</td></tr>
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<tr><td>6</td><td>Payment on submission of design and drawing for final approval.</td><td>1.00%</td></tr>
<tr><td>7</td><td>Payment for all foundations of Bridge on Pawana River</td><td>1.25%</td></tr>
</table>
</td></tr>
</table>

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
				River Bridge on Pawana including Bearings		8	Payment for all sub-structure including Bearings of Bridge on Pawana River.	2.00%
			9	Payment for all superstructures of River Bridge on Pawana including Expansion Joints, Crash Barriers & Railing.	2.00%	9	Payment for all superstructures including Expansion Joints, Crash Barriers & Railing of Bridge on Pawana River.	3.50%
			10	Payment for electrification (not covered under provisional Sum) etc. of River Bridge on Pawana	0.25%	10	Payment for electrification (not covered under provisional Sum) etc. of Bridge on Pawana River.	1.00%
			11	Payment for retaining structure for work of approach ramp including fill material, Crust development and asphalt surfacing of River Bridge on Pawana.	1.00%	11	Payment for retaining structure for work of approach ramp including fill material, Crust development and asphalt surfacing of Bridge on Pawana River.	1.50%
			12	Tree cutting, shifting of poles, electrical lines, cables etc. of River Bridge on Pawana	0.10%	12	Payment of miscellaneous items like kerb, painting/ protective coat, wearing coat, lane marking, traffic signages, gantries & Construction of all Staircases i.e Four Nos. etc. of Bridge on Pawana River.	0.75%
			13	Payment of miscellaneous items like kerb, painting/ protective coat to River Bridge, wearing coat, lane marking, traffic signages, gantries & Construction of all Stairacses etc. of River Bridge on Pawana	0.40%	13	Payment for all foundations for Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road	3.00%
			14	Payment for all foundations of Rail over Bridge on Pune Mumbai Rail Line	0.25%			
			15	Payment for all sub-structure including bearings of Rail over Bridge on Pune Mumbai Rail Line	0.50%			
			16	Payment for all superstructure including Expansion Joints,	1.00%			

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
				Crash Barriers & Railings of Rail over Bridge on Pune Mumbai Rail Line		14	Payment for all sub-structure including bearing for Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road	4.50%
			17	Payment for electrification (not covered under provisional Sum) etc. of Rail over Bridge on Pune Mumbai Rail Line	0.25%	15	Payment for all superstructure including Expansion Joint, Crash Barriers for Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road	15.00%
			18	Tree cutting, shifting of poles, electrical lines, cables etc. of Rail over Bridge On Pune Mumbai Rail Line.	0.10%	16	Payment for electrification (not covered under provisional Sum) etc for Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road	3.00%
			19	Payment of miscellaneous items like kerb, painting/ protective coat to ROB, wearing coat, lane marking, traffic signages, gantries & Construction of all Stairacses etc. of Rail over Bridge on Pune Mumbai Rail Line	0.40%	17	Payment of miscellaneous items like kerb, painting/ protective coat , wearing coat, lane marking, traffic signages, gantries etc for Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP	2.50%
			20	Payment for all foundations for Flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	2.50%			
			21	Payment for all sub-structure including bearing for Flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	5.00%			
			22	Payment for all superstructure including Expansion Joint, Crash Barriers & Railings for flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	7.50%			

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
			23	Payment for electrification (not covered under provisional Sum) etc for for flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	3.00%		road & existing Pimpri Chinchwad Link Road	
			24	Tree cutting, shifting of poles, electrical lines, cables etc for for flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	3.00%	18	Payment for all foundations of ROB on Central Railway - Mumbai Pune Railway Line.	1.50%
			25	Payment of miscellaneous items like kerb, painting/ protective coat to flyover/Viaduct, wearing coat, lane marking, traffic signages, gantries etc for flyover/Viaduct Portion in between Pawana River to ROB on Pune Mumbai Rail Line.	2.00%	19	Payment for all sub-structure including bearings of ROB on Central Railway - Mumbai Pune Railway Line.	1.50%
			26	Payment of all foundations for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.	5.00%	20	Payment for all superstructure including Expansion Joints, Crash Barriers & Railings of ROB on Central Railway - Mumbai Pune Railway Line.	1.50%
			27	Payment of all sub-structure including Bearings for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with	7.50%	21	Payment for electrification (not covered under provisional Sum) etc. of ROB on Central Railway - Mumbai Pune Railway Line.	0.75%
						22	Payment of miscellaneous items like kerb, painting/ protective coat to ROB, wearing coat, lane marking, traffic signages, gantries & Construction of all Staircases etc. of ROB on Central Railway - Mumbai Pune Railway Line.	0.75%

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
				approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.		23	Payment of all foundations for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending Ramp on Right of the Main Carriageway in Empire Estate Area	5.00%
			28	Payment of all superstructure including Expansion joints, Crash Barriers & Railings for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.	10.00%	24	Payment of all sub-structure including Bearings for for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending Ramp on Right of the Main Carriageway in Empire Estate Area	7.50%
			29	Payment of all electrification (not covered under provisional Sum) etc for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.	5.00%	25	Payment of all superstructure including Expansion joints, Crash Barriers for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending	13.00%
			30	Payment of all retaining structure for work of approach ramp including fill material, crust development and asphalt surfacing for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with	6.00%			

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
				approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.			Ramp on Right of the Main Carriageway in Empire Estate Area	
			31	Tree cutting, shifting of poles, electrical lines, cables etc etc for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.	5.00%	26	Payment of all electrification (not covered under provisional Sum) etc for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending Ramp on Right of the Main Carriageway in Empire Estate Area .	4.00%
			32	Payment on account of providing and erecting noise barriers in between River Bridge to ROB and From ROB to Pune Mumbai Highway of Flyover/Viaduct portion.	15.00%	27	Payment of all retaining structure for work of approach ramp including fill material, crust development and asphalt surfacing for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending Ramp on Right of the Main Carriageway in Empire Estate Area .	5.00%
			33	Payment of all miscellaneous items like kerb, painting/ protective coat to viaduct, wearing coat, lane marking, traffic signages, gantries etc for the entire remaining flyover/viaduct portion in between ROB on Pune Mumbai Rail Line with Crossing Pune Mumbai Highway with approach & Ramps on both side of flyover/Viaduct in Empire Estate Area and Ramp after Pune Mumbai Road.	5.00%			

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document			Amended Clause of the Bid Document		
			34	Payment on account of completion of rigid pavement of main carriageways of existing Pune Mumbai Highway in balanced portion.	3.00%	28	Payment of all miscellaneous items like kerb, painting/ protective coat to viaduct, wearing coat, lane marking, traffic signages, gantries etc for a Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach , Descending Ramp on Left of the Main Carriageway & Ascending Ramp on Right of the Main Carriageway in Empire Estate Area	3.00%
			35	Payment on account of video shooting photo album etc. and preparation and final submission of records, drawings, for complete River Bridge, flyover/Viaduct Portion, ROB, approaches and Ramps etc. to the satisfaction of Engineer.	3.00%	29	Payment of all foundations for Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre	0.25%
						30	Payment of all sub-structure including Bearings for Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre	0.50%
						31	Payment of all uperstructure including Expansion joints, Crash Barriers for Descending Ramp on Left of	1.00%

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document		
					the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre	
				32	Payment of all electrification (not covered under provisional Sum) etc for Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre	0.40%
				33	Payment of all retaining structure for work of approach ramp including fill material, crust development and asphalt surfacing for Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre	0.25%
				34	Payment of all miscellaneous items like kerb, painting/ protective coat to viaduct, wearing coat, lane marking, traffic signages, gantries etc for Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach &	0.10%

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document		
					Landing in front of proposed City Centre	
				35	Payment on account of providing and erecting noise barriers on Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road (From River Bridge to ROB) and Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach of Flyover/Viaduct portion (From ROB crossing with Pune Mumbai Highway).	5.00%
				36	Payment on account of completion of rigid pavement in remaining portion below the flyover of main Concrete Carriageway of Pune Mumbai road.	3.00%
				37	Payment on account of video shooting photo album etc. and preparation and final submission of records, drawings, for complete River Bridge, flyover/Viaduct Portion, ROB, approaches and Ramps etc. (Complete Project) to the satisfaction of	4.00%

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
				Engineer.
3	Mitigation Measures under Table 1 Pre-Construction Stage EMP	Volume III Page No 62	Utility relocation: - All utilities identified for relocation in the DPR to be shifted after prior approval of agencies. Utility relocation shall be carried out in the shortest possible time to reduce inconvenience to public.	Utility relocation: - All utilities identified for relocation shall be shifted after prior approval of agencies. Utility relocation shall be carried out in the shortest possible time to reduce inconvenience to public.
		Volume III Page No 62	Local Traffic Arrangement: - Temporary traffic arrangement during construction within ROW has been planned in the DPR. This plan shall be periodically reviewed with respect to site conditions.	Local Traffic Arrangement:- Temporary traffic arrangement during construction within ROW shall be planned. This plan shall be periodically reviewed with respect to site conditions.
		Volume III Page No 63	Safety of Pedestrians :- Special consideration shall be given in the local traffic management to the safety of pedestrians The temporary traffic arrangement within ROW as recommended in the DPR should be kept free of encroachments / commercial activities	Safety of Pedestrians: - Special consideration shall be given in the local traffic management to the safety of pedestrians The temporary traffic arrangement within ROW should be kept free of encroachments / commercial activities.
	Mitigation Measures under Table 2 Construction Stage EMP	Volume III Page No 68	Construction of new roadside drains :- Roadside drains have been proposed along Project in the DPR to improve the drainage along road. The drains shall be cleared off all construction debris before handing over to PCMC.	All roadside drains shall be cleared of construction debris etc., before handing over to PCMC.
		Volume III Page No 69	Aesthetics and Landscape :-Adequate landscaping of the median, embankment slopes and other open space available within ROW shall be carried out as provided in the DPR as per the directions of PMC/PMC. The area can be utilized for growing dwarf varieties of plants (e.g. Alstonia Scholaris, Thuja etc).	Aesthetics and Landscape :- Adequate landscaping of the median, embankment slopes and other open space available within ROW shall be carried out as per the directions of PMC/PMC. The area can be utilised for growing dwarf varieties of plants (e.g. Alstonia Scholaris, Thuja etc).
4.		Volume I Page No 66 & Volume II Page No 13 & 15	Payment on account of providing and erecting noise barriers & Noise barriers is to be provided with crash barrier on both side of the individual carriage way	Details of Noise Barriers:- Providing and Fixing Noise Barriers Consisting of:- Noise Barriers shall be designed, implemented as approved by the Engineer in Charge based on following specifications. • Noise barriers shall need to be considered from both acoustic and non acoustic aspects. The acoustic design

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
				aspects include barrier material, barrier locations, dimensions and shapes. The non acoustic design aspects include aspects such as structural integrity, safety, aesthetics and reduction of potential negative effects of noise barriers. • Noise barriers should be such that it shall shield receivers from the noise generated by traffic on the flyover. • The noise barriers may be in the form of vertical and crank top barriers, semi-enclosures, full enclosures and deck over. • A material that has a Transmission Loss (TL) of 33 db or greater shall be provided. Similarly the material surface density shall be less than 10 Kg/sqm. • In the design of noise barriers, sound “leaks” due to holes, slits, cracks or gaps through or beneath a noise barrier shall be avoided. Therefore to avoid reduction in acoustic performance or noise barriers, recess should be formed along the barrier to accommodate the street furniture as far as possible. • Following materials should only be used:- • Steel. • Aluminium. • Polycarbonate or acrylic sheets. • Concrete, brick or glass fibre reinforced concrete. • Proprietary made acoustic panels. • The material used shall have adequate fire resistance. Length of at least 4 m. made of non combustible elements shall be provided in every 100mt of noise barriers. Emergency access/ exist points are also required to assist evacuation. • If Barriers are in the form of enclosure, it should be uniform and avoid glare and flider effects. • Barriers shall not affect aesthetical perfection of both road users and residents. It should properly blend into the local environment. It should also integrate and

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
				coordinate with the street furniture. • The height of barriers shall not be more that 3 m. • Noise barriers should be designed so that they require minimal maintenance other than cleaning. Proper access should be provided for future maintenance. • Adequate ventilation shall be provided if barrier structure is an enclosure. • Noise barriers should form an integral part of road design. General:- Designing, Providing, Erecting Noise Barriers of required height including all incidentals, plant, tools , machinery, scaffolding & labours etc. shall be carried out as directed by the Engineer in Charge.
5	ITB 32.1 of Bid data Sheet	Volume I , Page No 36	ITB 32.1 :- The currency shall be: INDIAN NATIONAL RUPEES (INR) Source of exchange rate shall be "Bills Selling Exchange Rates established by State Bank of India" Exchange rate date shall be the date of opening of bids.	ITB 32.1 :- The currency shall be: INDIAN NATIONAL RUPEES (INR) Source of exchange rate shall be "Bills Selling Exchange Rates established by State Bank of India" Exchange rate shall be Twenty Eight Calendar days prior to submission of bid.
6	Particular Condition 14.1	Volume I , Page No 117	Sub Clause 14.1: The Contract Price Add following as (e) & Delete last Para (e) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts there for, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation.	Sub Clause 14.1: The Contract Price Add following as (e) & Delete last para Paragraph (e) is amended as follows: Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
				Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be exported, based on the depreciation scale(s and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to exported; and (b) on the initial imported value that Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining.
7	Clause 2300	Volume III Page N0 208 to 231	**Concrete Superstructure** Only following type of superstructure shall be allowed. Superstructure for non obligatory span shall be only with pre-cast / prefabricated / elements in pre / post tensioned Box / Pre-stressed concrete superstructure with closed soffit. Voided box type superstructure for ramp portion is permitted. Superstructure in cast-in-situ is permitted only for viaduct portion curved in plan. For obligatory span across ROB portion over Railway, pre-cast prestressed box girder/ I girder with cast-in-situ slab is proposed	**Concrete Superstructure** Only following type of superstructure shall be allowed. Superstructure for non obligatory span shall be only with pre-cast / prefabricated / elements in pre / post tensioned Box /Pre-stressed concrete superstructure with closed soffit. Voided box type superstructure for ramp portion is permitted. Superstructure in cast-in-situ is permitted other than obligatory spans. For obligatory span across ROB portion over Railway, pre-

<table>
<tr><th>Sr. No.</th><th>Clause No. / Item No.</th><th>Vol. & Page No.</th><th>Clause in the Bid Document</th><th>Amended Clause of the Bid Document</th></tr>
<tr><td></td><td></td><td></td><td>if required by railway authority . However same shall be as approved by the concerned Department.

Add the follow Clause after Section 2305.3:
---------- Clause 2309 Protective Coating to the faces of superstructure shall be as per design criteria and scope of work.</td><td>cast pre-stressed box girder/ I girder/Steel Girder with cast-in-situ slab as per requirements of the railway authority and with prior approval.

Add the follow Clause after Section 2305.3:
---------- Clause 2309 Protective Coating to the faces of superstructure shall be as per design criteria and scope of work.</td></tr>
<tr><td>8</td><td>Specific Experience Cl.2.4.2 (a)</td><td>Volume I Page No 48</td><td>
<table>
<tr><th>Factor</th><th colspan="7">2.4 Experience</th></tr>
<tr><th rowspan="3">Sub-Factor</th><th rowspan="3">Requirement</th><th colspan="4">Criteria</th><th rowspan="3">Documentation Required</th></tr>
<tr><th colspan="4">Bidder</th></tr>
<tr><th>Single Entity</th><th colspan="3">Joint Venture or Association</th></tr>
<tr><th></th><th></th><th></th><th>All partners combined</th><th>Each partner</th><th>At least one partner</th><th></th></tr>
<tr><td>2.4.2 Specific Experience</td><td>(a)Participation as contractor, management contracto</td><td>Must meet requirement</td><td>Must meet requirement</td><td>Must meet requirement for one chara</td><td>Must meet 51% Percent of the requi</td><td>Form EXP 2(a)</td></tr>
</table>
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<tr><td>2.4.2 Specific Experience</td><td>(a)Participation as contractor, management contracto</td><td>Must meet requirement</td><td>Must meet requirement</td><td>Must meet 30% Percent of the</td><td>Must meet 51% Percent of the</td><td>Form EXP 2(a)</td></tr>
</table>
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Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			r, or subcontractor, in at least one (1) contracts within the last **Five (5)** years , each with a value of at least **Indian National Rupees (INR) Eight Hundred Million (800) Million**, that have been successfully and substantially completed and that are similar to the proposed Works. ctaristic reme nt	r, or subcontractor, in at least one (1) contracts within the last **Five (5)** years , each with a value of at least **Indian National Rupees (INR) Eight Hundred Million (800) Million**, that have been successfully and substantially completed and that are similar to the proposed Works. **requirement** . requirement

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			The similarity shall be based on the physical size, complexity, methods/ technology or other characteristics as described in Section VI, Employer's Requirements. The similar work shall be either of works mentioned below • Vehicular Railway over-	The similarity shall be based on the physical size, complexity, methods/ technology or other characteristics as described in Section VI, Employer's Requirements. The similar work shall be either of works mentioned below • Vehicular Railway over-

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			bridge constructed across running railway tracks. • Vehicular river bridge minimum 100 m length across perennial rivers. • Vehicular flyover of minimum 100 m length across urban road / rural road/ natural barrier.	bridge constructed across running railway tracks. • Vehicular river bridge minimum 100 m length across perennial rivers. • Vehicular flyover of minimum 100 m length across urban road / rural road/ natural barrier.

<table>
<tr><th>Sr. No.</th><th>Clause No. / Item No.</th><th>Vol. & Page No.</th><th>Clause in the Bid Document</th><th>Amended Clause of the Bid Document</th></tr>
<tr><td></td><td></td><td></td><td></td><td>The value of Single work executed during the last five years shall be updated to 2010-11 price level at 5% per annum.</td></tr>
<tr><td>9</td><td>Volume I
Page No 69 ,70,71,72,73</td><td></td><td>Schedule of Daywork Rates: 1. Labour
<table>
<tr><th>Item no.</th><th>Description</th><th>Unit</th><th>Nominal quantity</th><th>Rate</th><th>Extended amount</th></tr>
<tr><td>D1</td><td>Plumber</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D2</td><td>Labourer</td><td>Hour</td><td>1000</td><td></td><td></td></tr>
<tr><td>D3</td><td>Bricklayer</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D4</td><td>Masons</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D5</td><td>Bar Bender/Fitter</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D6</td><td>Steelwork Erector</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D7</td><td>Driver for vehicle upto 10 tons</td><td>Hour</td><td>100</td><td></td><td></td></tr>
<tr><td>D8</td><td>Operator for excavator, dragline, shovel, or crane</td><td>Hour</td><td>100</td><td></td><td></td></tr>
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</table></td></tr>
</table>

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document

Clause in the Bid Document

D9	Operator for tractor with dozer blade or ripper	Hour	100		
D10	Electrician	Hour	100		
				Subtotal	
D11	Allow _____ percent[a] of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above.				

Total for Daywork: Labour _____
(carried forward to Daywork Summary, p.

a. To be entered by the bidder.

Schedule of Daywork Rates: 2. Materials

Item no.	Description	Unit	Nominal quantity	Rate	Extended amount
D21	Ordinary Portland Cement 43/53 Grade	t	100		
D22	High Tensile	t	100		
D23	Coarse				

Amended Clause of the Bid Document

	excavator, dragline, shovel, or crane				
D9	Operator for tractor with dozer blade or ripper	Hour	100		
D10	Electrician	Hour	100		
				Subtotal	
D11	Allow _____ percent[a] of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above.				

Total for Daywork: Labour _____
(carried forward to Daywork Summary)

a. To be entered by the bidder.

Schedule of Daywork Rates: 2. Materials

Item no.	Description	Unit	Nominal quantity	Rate	Extended amount
D21	Ordinary Portland Cement 43/53 Grade	t	100		
D22	High Tensile	t	100		
D23	Coarse aggregate				

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document					Amended Clause of the Bid Document					
				aggregate					10 mm	Cum	100		
				10 mm	Cum	100			12 mm	Cum	100		
				12 mm	Cum	100			20 mm	Cum	100		
				20 mm	Cum	100		D24	Fine aggregate for concrete as per specification				
			D24	Fine aggregate for concrete as per specification					c) Natural river sand d) Crushed sand	m3	100		
				a) Natural river sand b) Crushed sand	m3	100		D25	TMT Reinforcement Bars				
			D25	TMT Reinforcement Bars					10, 12 mm	MT	10		
				10, 12 mm	MT	10			16 mm and above	MT	10		
				16 mm and above	MT	10		D26	Pipeline for domestic water supply all diameters with fittings	RM	10		
			D26	Pipeline for domestic water supply all diameters with fittings	RM	10		D27	Pipeline for main distribution with fittings including testing	RM	50		
			D27	Pipeline for main distribution with fittings including testing	RM	50		D28	Pipe appurtenance complete	No	10		
			D28	Pipe appurtenance	No	10							

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document						Amended Clause of the Bid Document					
				complete including testing						including testing				
			D29	Ferrule and stoppers all diameters	No	50			D29	Ferrule and stoppers all diameters	No	50		
			D30	Manhole covers	No	10			D30	Manhole covers	No	10		
			D31	Drainage for elevated corridor : Provision of 300 mm dia. NP-3 type - connection to storm water drain	RM	10			D31	Drainage for elevated corridor : Provision of 300 mm dia. NP-3 type - connection to storm water drain	RM	10		
			D32	High Performance Concrete M-60	Cum	50			D32	High Performance Concrete M-60	Cum	50		
			D33	RCC/PSC Concrete a) M-40 Grade	Cum	50			D33	RCC/PSC Concrete a) M-40 Grade	Cum	50		
				b) M-35 Grade	Cum	10				b) M-35 Grade	Cum	10		
				c) Upto M30 Grade	Cum	10				c) Upto M30 Grade	Cum	10		
			D34	M S Liner 6 mm thick for 1200 dia. piles	RM	10			D34	M S Liner 6 mm thick for 1200 dia. piles	RM	10		
							Subtotal						Subtotal	
			D35	Allow _____ percent[a] of Subtotal for					D35	Allow _____ percent[a] of Subtotal for Contractor's overhead, profit, etc.,				

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document

Clause in the Bid Document

	Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above.	
	Total for Day work : Materials (carried forward to Day work Summary, p.	

a. To be entered by the bidder.

Schedule of Daywork Rates: 3. Contractor's Equipment

Item no.	Description	Nominal quantity (hours)	Basic hourly rental rate	Extended amount
D301	Excavator, faces shovel, or dragline	100		
.1	Up to and including 1 m3	100		
.2	Over 1 m3 to 2 m3	100		
.3	Over 2 m3	100		
D302	Tractor, including angle dozer.	100		
D303	Concrete Breaking Device	10		
D304	Concrete Cutter (Saw)	10		
D305	Dewatering pump of suitable HP	BHP hr		
Total for Day work: Contractor's Equipment (Carried forward to Day work Summary, p.				

Amended Clause of the Bid Document

	in accordance with paragraph 3 (b) above.	
	Total for Day work : Materials (carried forward to Day work Summary)	

a. To be entered by the bidder.

Schedule of Daywork Rates: 3. Contractor's Equipment

Item no.	Description	Nominal quantity (hours)	Basic hourly rental rate	Extended amount
D301	Excavator, faces shovel, or dragline			
.1	Up to and including 1 m3	100		
.2	Over 1 m3 to 2 m3	100		
.3	Over 2 m3	100		
D302	Tractor, including angle dozer.	100		
D303	Concrete Breaking Device	100		
D304	Concrete Cutter (Saw)	10		
D305	Dewatering pump of suitable HP	100 BHP Hr		
Total for Day work: Contractor's Equipment (Carried forward to Day work Summary)				

<table>
<tr><th>Sr. No.</th><th>Clause No. / Item No.</th><th>Vol. & Page No.</th><th>Clause in the Bid Document</th><th>Amended Clause of the Bid Document</th></tr>
<tr><td></td><td></td><td></td><td>Daywork Summary
<table><tr><td></td><td>Amount In Indian National Rupees (INR)</td><td>% Foreign</td></tr><tr><td>1.Total for Daywork : Labour</td><td></td><td></td></tr><tr><td>Total for Daywork: Materials</td><td></td><td></td></tr><tr><td>3.Total for Daywork: Contractor's Equipment</td><td></td><td></td></tr><tr><td>Total for Daywork (Provisional Sum) (carried forward to Bid Summary, p.)</td><td></td><td></td></tr></table></td><td>Daywork Summary
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<tr><td>10</td><td>Section 1700</td><td>Volume III Page No 181</td><td>STRUCTURAL CONCRETE
The work shall consist of forming and placing of concrete. All concrete preferably shall be ready mixed concrete except for railway portion. For railway portion necessary approval to use of RMC from the railway authorities shall have to be sought by the contractor if he proposes so.

Clause 1702
Materials
a) No creek sand shall be allowed in concreting. Only river sand from approved source shall be allowed. The suspicious aggregates shall be dealt in accordance with IS 2386 (part VII) for alkali aggregate reactivity.

b) Cement from ACC / Gujarat Ambuja / L&T.</td><td>STRUCTURAL CONCRETE
The work shall consist of forming and placing of concrete. All concrete preferably shall be ready mixed concrete except for railway portion. For railway portion necessary approval to use of RMC from the railway authorities shall have to be sought by the contractor if he proposes so.

Clause 1702
Materials
a) No creek sand and crushed sand shall be allowed in concreting. Only river sand from approved source shall be allowed. The suspicious aggregates shall be dealt in accordance with IS 2386 (part VII) for alkali aggregate reactivity. Creek sand/Crush Sand mentioned elsewhere in the bid document shall be ignored.

b) Cement of OPC 43 Grade only shall be used. The approved manufactures are ACC / Gujarat Ambuja / ultratech/Birla. OPC 53 Grade of cement mentioned elsewhere in the bid document shall be ignored.</td></tr>
</table>

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			c) Minimum 15% flyash to be used in the construction of foundation and substructure.	c) Minimum 15% flyash to be used in the construction of foundation and substructure.
11	Clause 11 Sub Clause 11.3	Volume II Page No 53	**11. DURABILITY** 11.3 The minimum nominal dia. of reinforcement and clear cover shall be as follows **(Only Fe-500 TMT CRS steel shall be used).**	**11. DURABILITY** 11.3 The minimum nominal dia. of reinforcement and clear cover shall be as follows **(Only Fe-500 CRS steel shall be used. HYSD/TMT Steel mentioned elsewhere in the bid document shall be ignored).**
12	Clause SP 7	Volume III Page No 42	**EXTERNAL LIGHTING INSTALLATIONS** 4 Lighting Poles The street lighting installation for the project shall be carried out by use of out door type, weatherproof luminaries, to be mounted on octagonal Hot dip galvanized poles inside & out side. The street light poles shall be fabricated from heavy duty cold rolled sheets confirming continuously tapering. The pole height above ground shall be **10 Mtrs**. Hot dip galvanized inside and outside confirming to BS 729 Part I, BS 5135, IS 475G-1984, IS 2629-1985, IS:2633-1972. The galvanizing shall be 65 microns and shall be recorded and results finished while bidding. The street light poles shall be provided with suitable size foundation plate, with suitable opening for 3''-4 cables and holes for foundation bolts. The terminal box shall be provided with Epoxy terminals and MCB's shall be concealed inside the pole. --- --- The pole shall be manufactured as per IS and test certificates shall be submitted to Engineer-in-Charge for approval.	**EXTERNAL LIGHTING INSTALLATIONS** 4 Lighting Poles The street lighting installation for the project shall be carried out by use of out door type, weatherproof luminaries, to be mounted on octagonal Hot dip galvanized poles inside & out side. The street light poles shall be fabricated from heavy duty cold rolled sheets confirming continuously tapering. The pole height above ground shall be **9 Mtrs**. Hot dip galvanized inside and outside confirming to BS 729 Part I, BS 5135, IS 475G-1984, IS 2629-1985, IS:2633-1972. The galvanizing shall be 65 microns and shall be recorded and results finished while bidding. The street light poles shall be provided with suitable size foundation plate, with suitable opening for 3''-4 cables and holes for foundation bolts. The terminal box shall be provided with Epoxy terminals and MCB's shall be concealed inside the pole. --- --- The pole shall be manufactured as per IS and test certificates shall be submitted to Engineer-in-Charge for approval.

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
13	Clause SP 7 & 11	Volume III Page No 42 & 46	**7. Street Lighting Fittings Suitable for Son-T (+) Lamps** Street light fittings shall be integral type pot optics and suitable for 250W SON-T lamps and any of following makes: Philips (Velocity) BAJAJ (Momentum) Crompton Greaves (Acceleration) ---------- The fitting shall be insect and weather proof confirming to IS 10322 and IP 66 protection rating. 11.0 **The following work will be carried out by the Contractor** (including the descriptions in Employers Requirement) 11.1 The work to be carried out under this contract comprises of design, manufacture, inspection / testing, supply, transportation, storage, erection, testing commissioning for street lighting by installation of 9.00 meter high galvanized octagonal shaped lighting poles at a distance not exceeding 25 m. on either side of the flyovers, slip road, feeder pillars for controlling the below mentioned lights fabricated using minimum 10 SWG white CRCA sheet and painted using powder coated granular finished Siemens gray RAL 7032 colour shade, street lighting fixtures for the flyovers GE make having Cat GEMR 250 SP PT suitable for 250 Watts metal halide, high bay light fixtures for blow the Road Over Bridge of GE make having Cat No. GEMI 250 AH SM (P-TE) suitable for 250 Watts metal halide lamp and low by fixtures for under pass way having Cat No. GELI 70 MH suitable for 70 watts double-ended metal allied lamp, floodlights for the circle area of GE make having Cat No. GELF 2 x 250 CA suitable for 2 nos. 250 Watts clear tubular metal halide lamp, Hot dipped galvanized junction boxes, and necessary protection by Double Wall Corrugated (DWC) pipes of PE with IS-14930 Part-II Mark, earthing of the poles using 8 SWG GI wire to be run along with the cable, cabling to the individual fittings / poles AYFY /	**7. Street Lighting Fittings Suitable for CDMTT (+) Lamps** Street light fittings shall be integral type pot optics and suitable for 250W CDMTT lamps and any of following makes: Philips (Velocity) BAJAJ (Momentum) Crompton Greaves (Acceleration) ---------- The fitting shall be insect and weather proof confirming to IS 10322 and IP 66 protection rating. 11.0 **The following work will be carried out by the Contractor** (including the descriptions in Employers Requirement) 11.1 The work to be carried out under this contract comprises of design, manufacture, inspection / testing, supply, transportation, storage, erection, testing commissioning for street lighting by installation of 9.00 meter high galvanized octagonal shaped lighting poles at a distance not exceeding 25 m. on either side of the flyovers, slip road, feeder pillars for controlling the below mentioned lights fabricated using minimum 10 SWG white CRCA sheet and painted using powder coated granular finished Siemens gray RAL 7032 colour shade, street lighting fixtures for the flyovers GE make having Cat GEMR 250 SP PT suitable for 250 Watts CDMTT, high bay light fixtures for blow the Road Over Bridge of GE make having Cat No. GEMI 250 AH SM (P-TE) suitable for 250 Watts metal halide lamp and low by fixtures for under pass way having Cat No. GELI 70 MH suitable for 70 watts double-ended metal allied lamp, floodlights for the circle area of GE make having Cat No. GELF 2 x 250 CA suitable for 2 nos. 250 Watts clear tubular metal halide lamp, Hot dipped galvanized junction boxes, and necessary protection by Double Wall Corrugated (DWC) pipes of PE with IS-14930 Part-II Mark, earthing of the poles using 8

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
			YFY/ XLPE armoured / PVC flexible cable. --- --- 11.6 The Contractor shall also be responsible for getting approvals from the various bodies such as Supply Authority, Electrical Inspector, PWD, MSEDCL, , Government of Maharashtra and any other statutory bodies. The cost invoked for getting the necessary approvals is to be included in the cost of the overall work. No separate payment towards the same will be paid to the Contractor. The owners will reimburse the official fees paid by the Contractor to the various departments. The Contractor will have to submit the original copies of the bills / challans and copy of the receipt of the payment made to the various departments.	SWG GI wire to be run along with the cable, cabling to the individual fittings / poles AYFY / YFY/ XLPE armoured / PVC flexible cable. --- --- 11.6 The Contractor shall also be responsible for getting approvals from the various bodies such as Supply Authority, Electrical Inspector, PWD, MSEDCL, Government of Maharashtra and any other statutory bodies. The cost invoked for getting the necessary approvals is to be included in the cost of the overall work. No separate payment towards the same will be paid to the Contractor. The owners will reimburse the official fees paid by the Contractor to the various departments. The Contractor will have to submit the original copies of the bills / challans and copy of the receipt of the payment made to the various departments.
14	Clause 4 Invitation For Bids (IFB)	Volume I Page No 3	Interested eligible bidders may obtain further information from and inspect bidding documents at the Office of the City Engineer, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road, Pimpri, Pune 411 018. Maharashtra, India. Phone No. 91-20-67333333, Fax No.91-20-67330000, email id:-pcmc@vsnl.com from **18/08/2010 to 01/10/2010 during office hours (10.00 to 16.00 hrs)**.	Interested eligible bidders may obtain further information from and inspect bidding documents at the Office of the City Engineer, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road, Pimpri, Pune 411 018. Maharashtra, India. Phone No. 91-20-67333333, Fax No.91-20-67330000, email id:-pcmc@vsnl.com from **18/08/2010 to 25/10/2010 during office hours (10.00 to 16.00 hrs)**.
15	Clause 7 Invitation For Bids(IFB) & Section II Bid Data Sheet 22.1 ITB	Volume I Page No 3 & 35	Bids must be delivered to the Controller of Stores, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road, Pimpri, Pune 411 018. Maharashtra, India on or before 15.00 hours on **04/10/2010** and must be accompanied by a bid security of Rs 9.90 Million or equivalent amount in freely convertible currency	Bids must be delivered to the Controller of Stores, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road, Pimpri, Pune 411 018. Maharashtra, India on or before 15.00 hours on **26/10/2010** and must be accompanied by a bid security of Rs 9.90 Million or equivalent amount in freely convertible currency.
16	Clause 8 Invitation For Bids (IFB) &	Volume I Page No 3 & 36	Bids will be opened in the presence of bidders' representatives who choose to attend at 15.30 hours on **04/10/2010** at the office of Controller of Stores, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road, Pimpri, Pune 411 018.	Bids will be opened in the presence of bidders' representatives who choose to attend at 15.30 hours on **26/10/2010** at the office of Controller of Stores, Pimpri Chinchwad Municipal Corporation, Mumbai Pune Road,

Sr. No.	Clause No. / Item No.	Vol. & Page No.	Clause in the Bid Document	Amended Clause of the Bid Document
	Section II Bid Data Sheet 25. 1 ITB		Maharashtra, India.	Pimpri, Pune 411 018. Maharashtra, India.
17	Clause No SP 11	Volume III Page No 61 to 74	**CLAUSE SP-11 ENVIRONMENTAL MANAGEMENT PLAN**	Please Replace this entire clause stated in SP 11 **ENVIRONMENTAL MANAGEMENT PLAN by Annex 1 attached herewith.**
18		Volume II Page No 1 To 74	**Volume II page No 1 to 74**	Please Replace the entire Volume II by amended Volume II , page no 1 To 76 **attached herewith.**
19		Volume IV	**Volume IV**	Please Replace the entire Volume IV by amended Volume IV **attached herewith along with soft copy.**
20	Clause 13	Volume I Page No 117	**Clause 13 Variations and Ajustements**	**Replace Sub clause 13.5 (b)(i)(ii) by the following:** **Payment for Items covered under Provisional Sum**: - The measurements of work carried out under provisional sum shall be jointly recorded with the representative of bidder and shall be paid at the prevailing Schedule of Rates of concerned utility departments (Civil, Water supply, Drainage, Electrical, Railway, Garden etc). Where prevailing Schedule of Rates are not available, the rates shall be worked at market rates and approved by the Engineer In Charge.

Enclosures :- A) Annex 1 B) Amended Volume II C) Amended Volume IV with soft copy.

ANNEX -1

FOR

ENVIRONMENTAL MANAGEMENT PLAN

Annex 1

CLAUSE SP-11 ENVIRONMENTAL MANAGEMENT PLAN

The Contractor shall implement the EMP measures, enhancement measures and measures as directed by PMC and PCMC. The contractor shall submit a report on compliance with the environmental mitigation measures **E**nvironmental **C**ompliance **R**eports i.e. **ECR**s periodically to the PMC. The PMC shall review and approve the ECRs submitted by the Contractor. After approval, the PMC shall forward the ECR to Engineer in Charge. The EMP shall be implemented in the following manner.

11.1 AIR ENVIRONMENT

Construction Phase

To mitigate the impact of SPM/dust during the construction phase of the proposed project, the following measures are recommended:

- A Fugitive dust control.
- Procedural changes to construction activities.

Fugitive Dust Control

Source wise Fugitive dust control measures are tabulated below:

Fugitive Dust Control Measurers

Source	**Control Measures**
Earth moving	- For any earth moving which are more than 30m from site boundary, conduct watering as necessary to prevent visible dust emissions. -
Source	**Control Measures**
Disturbed surface areas	- Apply dust suppression measures frequently to maintain a stabilized surface; - Areas, which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day.
Inactive disturbed surface areas	- Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface.
Unpaved roads	- Water all roads used for any vehicular traffic at least twice per day of active operations; OR - Water all roads used for any vehicular traffic once daily and restrict vehicle speed to 20 kmph, which shall reduce dust emission.
Open storage	- Apply water to at least 80 percent of the surface areas of all open

piles	storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR - Install an enclosure all along the storage piles.
Track-out control	- Downwash of construction vehicles (especially tyres) prior to departure from site.

The most cost-effective dust suppressant is water. Water can be sprinkled by the handheld sprays or with the help of automatic sprinkler systems as the situation would demand. The incoming loads of dusty materials could be covered to avoid spreading of dust. Besides; loss of material in transport, especially if material is transported off-site, can very well be minimised.

Procedural Changes in Construction Activities

• **Material Production** - The transport of materials such as concrete, asphalt, etc. to construction sites generate significant amounts of road dust, especially for sites that are relatively far off from the material manufacturers. Setting up the temporary portable concrete plants and/or asphalt plants at construction
sites can eliminate haulage of these materials.

• **Idling Time Reduction** - Construction equipment is generally left idling while the operators are on break or waiting for the completion of another task. Emissions from idling equipment tend to be high, since catalytic converters cool down, thus reducing the efficiency of hydrocarbon and carbon monoxide
oxidation. Existing idling control technologies, which automatically shut the engine off after a preset time can reduce emissions, without intervention of the operators.

• **Improved Maintenance** - Recognizing that significant emission reductions can be achieved through regular equipment maintenance, contractors could be asked to provide maintenance records for their fleet at regular intervals as a part of the contract awarded to them. A monetary incentive/disincentive provision could be made to encourage contractors to comply with the regular maintenance requirements.

• **Reduction of on-site construction time** - Rapid on-site construction could reduce the duration of traffic interference and therefore, reduce emissions from traffic delay.

To mitigate the impact of pollutants from vehicular traffic during the construction phase of the site, the following measures are recommended for implementation:

• Vehicle emission controls; and

• Greenbelt development.

Vehicle Emission Controls

Vehicles (Cars, Buses, Two-Three wheelers and Light Commercial Vehicles) to be used should be confirmed to Euro-III norms, which are in force. Regular maintenance of the vehicle

should be mandatory. Restriction of speed is also helpful in the reducing the emission rate. Instead of petrol, the fuels like CNG/LPG could be encouraged.

Greenbelt Development

Increasing vegetation in the form of greenbelt is one of the preferred methods to mitigate air pollution. Plants generate oxygen, serve as a sink for pollutants, reduce the flow of dust and reduce the noise pollution too along available space in office & plant premises.

11.2 NOISE ENVIRONMENT

Construction Phase

To mitigate the impact of noise from construction equipment, the following measures are suggested:

• Noise prone activities could be restricted to the extent possible during night.

• Workers employed in high noise areas would be rotated. Earplugs/muffs, or other hearing protective devices could be provided to those working very close to the noise generating machinery.

To mitigate the impact of noise from Vehicular movement at operational time the Noise barriers are recommended for implementation as details enclosed in Annex 1 with this amendment.

11.3 IMPACT ON WATER RESOURCES

To prevent degradation and maintain the quality of the water, adequate control measures have been proposed to check the surface run-off, as well as uncontrolled flow of water into any nearby water body like small pond, stream, etc. Following management measures are suggested to protect the water quality during this phase.

• Avoid excavation during monsoon season.

• Care should be taken to avoid soil erosion.

• Pit latrines and community toilets with temporary soak pits and septic tanks should be constructed on the site during construction phase to prevent the wastewater from entering into the water bodies.

• To prevent surface and ground water contamination on account of oil/grease, etc. leak proof containers should be used for storage and transportation of oil/grease. The floors of oil/grease handling area should be kept effectively impervious. Any wash off from the oil/grease handling area or workshop should be drained through impervious drains and effluent should be treated appropriately before releasing it.

• Construction activities generate disturbed soil, concrete fines, oils and other wastes. On-site collection and settling of storm water, prohibition of equipment wash downs, toxic releases from the construction site, etc. are some of the essential measures which prove helpful in minimising water pollution.

11.4 Impacts on Land Environment

Construction Phase

Waste generated from construction activity includes construction debris, biomass from land clearing activities, waste from the labour camp, etc. Following section discusses management for each type of waste. Besides management of topsoil is an important area for which management measures are required.

Construction Debris:

The main sources of construction debris on proposed project are construction debris. Construction debris is bulky and heavy and re-utilization and recycling is an important strategy for management of such waste. As concrete and masonry constitute the majority of waste generated, recycling of this waste by conversion to aggregate can offer benefits of reduced landfill space and reduced extraction of raw material for new construction activity. This is applicable to proposed site since the construction is to be completed in a phased manner.

Recycled aggregate could be used for filler application, and as a sub base for road construction.

Construction contractors have to remove metal scrap from structural steel, piping, concrete reinforcement and sheet metal work from the site. A significant portion of wood scrap can be reused on site. Recyclable wastes such as plastics, glass fibre insulation, roofing etc shall be sold to recyclers. According to instruction of Engineer in Charge these debris shall be transported to landfill site within its municipal limits.

Waste from labour camp & Biomass:

Waste generated from labour camps shall mainly comprise the household domestic waste, which could be collected and composted on site along with the biomass from the land clearing activities. The non-compostable and non-recyclable portion of the waste shall be collected and transported to the nearest identified landfill site.

Topsoil Management

To minimize disruption of soil and for conservation of topsoil, the contractor shall take the topsoil out separately and stockpile it. After the construction activity is over, topsoil shall be utilized for landscaping activity. Other measures, which would be followed to prevent soil erosion and contamination include:

• Maximize use of organic fertilizer for landscaping and green belt development.

• To prevent soil contamination by oil/grease, leak proof containers could be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through impervious drains and treated appropriately before disposal.

• Removal of as little vegetation as possible during the development, and re-vegetation of bare areas after the project.

• Working in a small area at a point of time (phase wise construction).

11.5 BIOLOGICAL ENVIRONMENT

Construction Phase

Cutting, uprooting, coppicing of trees or small trees present in and around labour camps for cooking, burning or heating purposes shall be prohibited and suitable alternatives for this purpose shall be found. After completion of major construction work, the debris should removed.

• Plantation & Landscaping

Selection of the plant species to be done on the basis of their adaptability to the existing geographical conditions and the vegetation composition of the region. During the development of the green belt within the project area, emphasis shall be given on selection of plant species like nitrogen fixing species, species of ornamental values, species of very fast growth with good canopy cover etc.

11.6 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures suggested above shall be implemented so as to reduce the impact on environment due to the proposed development of project.

11.7 Environmental Management System & Monitoring Plan

For the effective implementation of EMP, an Environmental Management System (EMS) should be established at the site by the contractor. The EMS should include the following:

- An environmental management cell.
- Environmental Monitoring.
- Personnel Training.
- Regular Environmental Audits & Corrective Action.
- Documentation:- Standard operating procedures Environmental Management Plans & other records.

11.7.1 Environmental Management Cell

A Cell for Environmental Management at the project (Site) level, shall take the overall responsibility for co-ordination of the actions required for environmental management and mitigation, and for monitoring the progress of the proposed management plans and actions to be taken for the project. The Cell shall be headed by a qualified environmental engineer and the other members of the cell that shall include an environmental field officers, scientist, chemists and operators. The cell shall report to Engineer In charge/PMC directly for regular compliances.

The EMC shall prepare a formal report on environmental management at six-monthly intervals. Reports on any urgent or significant issues may be prepared at shorter intervals. Apart from responsibilities listed above, the EMC shall have the responsibility of the following:

-To implement the environmental management plan,
- To assure regulatory compliance with all relevant rules and regulations,
- To minimize environmental impacts as by strict adherence to the EMP,
- To initiate environmental monitoring as per approved schedule.
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference.
- Maintain environmental related records.
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- All the Environment related aspects shall be handled by a dedicated group and shall be responsible for the compliance to all the issues
- To manage post project-monitoring plan as per approved EMP.
- To work for continuous & regular improvement in environmental engineering.

ENVIRONMENTAL SAFEGUARDS

In addition to above 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.

i. Appropriate measures shall be undertaken while undertaking digging activities to avoid degradation of water quality.
ii. Borrow pits and other scars created during the road construction shall be properly leveled and treated.
iii. No excavation from or dumping of waste materials into any water body / wetlands shall be done.
iv. Borrow sites for earth, quarry sites for road construction and dump site shall be identified keeping in view:
v. No excavation or dumping on private property is carried out without written consent of the owner.
vi. No excavation or dumping shall be allowed or wetlands, forests areas or other ecologically valuable or sensitive locations.
vii. The excavation work shall be done in consultation with soil conservation and watershed development agencies working in the area:
viii. Construction spoil including bituminous 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.
ix. The trees, which are necessary to be felled should be identified before hand and necessary approval from the competent authority should be obtained for felling the same. Sufficient number of trees of suitable species should be planted in lieu of the trees felled.
x. A contingency plan shall be prepared to combat with accidents so that the victims of accident can be provided immediate medical help. Some essential equipment, building and other facilities may be required for the purpose.
xi. The Employer or any other competent authority may stipulate any other condition for environmental safeguard, subsequently, if deemed necessary, which should be compiled with.
xii. The above mentioned stipulations shall 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, the Hazardous Chemicals (Manufacture, Storage and Import) Rule, 1989, the Environmental Impact Assessment (EIA) Notification 1994 and its amendment of May 1994, April 1997, January 2000, the Public Liability Insurance Act 1991 and the rules made there under from time to time.
xiii. Adequate provision for infrastructural facilities, i.e. water supply, fuel, sanitation, etc. shall be ensured for labourers during construction period in order to avoid damage to the environment.

11.7.2 Environmental Monitoring

The purpose of environmental monitoring is to evaluate the effectiveness of implementation of Environmental Management Plan (EMP) by periodically monitoring the important environmental parameters within the impact area, so that any adverse affects are detected and timely action can be taken. In consultation with MPCB, the contractor shall monitor ambient air quality, noise levels, groundwater quality and quantity, soil quality and solid wastes in accordance with an approved monitoring schedule. The monitoring protocol and location selection shall have to be done carefully in consultation with Engineer in Charge. The monitoring and sampling program should be discussed and approved by MPCB in consultation with Engineer in Charge. A suggested monitoring protocol, based on the predicted impacts, is given below.

Table 1 Pre-Construction Stage EMP

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Utility relocation	All utilities identified for relocation is to be shifted after prior approval of agencies. Utility relocation shall be carried out in the shortest possible time to reduce inconvenience to public.	MORTH 110	Before start of construction of relevant section	Contractor/PCMC	PMC
Impact on land use outside ROW	Construction related activities shall be preferably restricted within project road ROW.	MORTH 201.2	During entire site clearance and construction phases	Contractor	PMC
Resettlement of Cultural Property	All cultural properties that have affected shall be resettled as per the action plan laid out in Rehabilitation Implementation Plan (RIP) and Consolidated EA	RIP Requirement	Before start of construction of relevant section	PCMC	PCMC
Ecological impacts due to tree cutting	Trees falling within the alignment which are to be removed before commencement of construction shall be identified and approved by PMC. Prior permission from PCMC /Tree authorities shall be obtained.	Preservation of Tree Act of Maharashtra, 1975	Before start of construction of relevant section	Contractor	PMC/ PCMC
Local Traffic Arrangement	Temporary traffic arrangement during construction within ROW has to be plan and this plan shall be periodically reviewed with respect to site conditions. During site clearance activity, the demolition debris shall be preferably removed during non-peak hours and with deployment of more vehicles for the purpose.	MORTH: 112	During site clearance and construction	Contractor/PCMC	PMC/PCMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Traffic Control and Safety	The Contractor shall take all necessary measures for the safety of traffic during demolition and site clearing activities. He shall provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the PMC for the information and protection of traffic	MORTH: 112.4 MORTH: 112	During pre-construction and construction	Contractor	PMC
Safety of Pedestrians	Special consideration shall be given in the local traffic management to the safety of pedestrians The temporary traffic arrangement within ROW should be kept free of encroachments / commercial activities	MORTH: 112.2	Before construction and during construction	Contractor	PMC

Note: PMC – Project Management Consultant; PCMC-Pimpri Chinchwad Municipal Corporation: MORTH – Ministry of Road Transportation and Highways (formerly Ministry of Surface Transport, MOST Specifications for Road and Bridge Works, 3rd Revision, 1997); RAP – Rehabilitation Action Plan; RIP – Rehabilitation Implementation Plan, R & R – Resettlement & Rehabilitation; CEMP – Community Environmental Management Plan; CEA – Consolidated Environmental Assessment,; ROW – Right of Way; ProW – Proposed Right of Way

Table 2 Construction Stage EMP

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Plying vehicles on unpaved roads	The unpaved roads, if used by the Contractor, shall be sprinkled with water at least once in a day to control the fugitive dust emissions	MORTH: 111:10	Construction Phase	Contractor	PMC
Material Spill	All vehicles delivering material to the site shall be covered to avoid material spillage	MORTH:111.9 MORTH: 111.11 MORTH: 111.12	Entire Construction Phase	Contractor	PMC
Using existing hot mix/Concrete/Asphalt Plants	It is understood from the implementing authorities, that the Contractor will utilize the existing Concrete, Asphalt and Hot Mix Plants. Contractor shall ensure that existing plants, which are sourced, are licensed and authorized for operation by concerned authorities and shall intimate the PCMC/PMC prior to procuring materials from them. PCMC shall procure relevant documents from the plant owners to ensure that they are adhering to relevant emission norms as laid out by MoEF/MPCB	MO RTH:111.5	During Entire Construction Phase	Contractor/PMC	PMC
Watering to control dust at site	Construction site to be watered periodically to minimize fugitive dust generation	MORTH: 111.8	During entire construction Phase	Contractor/PMC	PMC
Roads used for transport	Contractor shall ensure that the transport vehicles used to ferry materials and dispose debris does not	MORTH: 111.9	During entire construction Phase	Contractor/PMC	PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
	create hazardous conditions for general traffic using the roadway.				
Barricading site	The construction site should be barricaded at all time in a day with adequate marking, flags, reflectors etc., for the safety of general traffic movement and pedestrians	MORTH 112	During Construction Phase	Contractor/PMC	PMC
Earthwork	All earthwork and construction material should be stored in such a manner to minimize generation of dust and spillage on roads.	MORTH 201.4	During entire construction phase	Contractor/PMC	PMC
Idling of vehicles	Idling of delivery trucks or other equipment should not be permitted during periods of unloading or when they are not in active use. This practice must be ensured especially near sensitive receptors like places of worship.	MORTH 201.2	During Construction Phase	Contractor	PMC/PMC
Drilling Operations	All possible and practical measures to control noise emission during drilling operations shall be employed. The PMC may direct to take adequate control measures depending on site conditions.	MORTH 111	During Construction Phase	Contractor/PMC	PMC
Construction equipment emissions	Exhaust and noise emissions of construction equipment's shall adhere to emission norms as laid out by MoEF/MPCB.	Legal requirement	During Construction	Contractor/PMC	PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Noise from construction related plants & equipments.	All construction equipment's shall be fitted with exhaust silencers. Damaged silencers to be promptly replaced by Contractor.	MORTH: 111	During Construction	Contractor/PMC	PMC
Noise impact due to operation of DG sets	DG sets, if used, shall adhere to noise standards of MoEF	MORTH: 111	During Construction	Contractor/PMC	PMC
Noise level near residential, commercial areas and sensitive receptors	Construction activity induced noise levels shall be mitigated throughout the stretch. The Contractor can employ mitigation measures such as restricted and/or intermittent activity or as directed by PCMC.	MORTH: 111	During Construction of relevant sections	Contractor/PMC	PMC
Noise due to foundation works at flyover and ROB/Viaduct	Operation hours for noise generating equipments such as pile driving, concrete and drilling etc. shall be pre-approved by PMC. The PMC depending upon site conditions and as per prevailing local laws may regulate and/or restrict operation hours.	-	During Construction	Contractor	PMC/PMC
Exposure to Loud Noise	Workers exposed to loud noise (As per Factory Act requirements) shall wear earplugs/earmuffs	MORTH: 111.6 MORTH: 105.2	During Construction	Contractor	PMC/PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Storage of construction material	Construction material containing fine particles shall be stored in an enclosure such that sediment laden water does not drain into nearby storm water drains and underground sewage pipes and water line.	MORTH: 306	During Construction	Contractor	PMC
	Earth, stone or any other construction material shall be properly stored so as not to block the flow of water. If the channel/drains get blocked due to negligence, contractor should ensure that they are cleaned especially during monsoon season. Once the work is completed in all respects, the Contractor shall as a mark of good gesture, clean up the drains along the project road to the extent possible.	MORTH: 306	During Construction	Contractor	PMC/PMC
Existing/Construction of new roadside drains	Existing Roadside drains are along Project needs to be cleared off if any constructional debris falls in the drains before handing over to PCMC.	MORTH: 306 MORTH: 309	During Construction	Contractor	PMC/PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Siltation of water bodies	Siltation of soil into water bodies Nallah/Drain shall be prevented as far as possible by adopting soil erosion control measures as per MoSRT&H guidelines / or as per the directions of PCMC	MORTH Guidelines 305 through 309	During Construction	Contractor	PMC/PMC
Foundation excavation debris	Bentonite slurry or similar debris generated from pile driving or other construction activities shall be disposed such that it does not flow into surface water bodies viz., Nallah/Drain or form mud puddles in the area.	Project requirement	During Construction	Contractor	PMC/PMC
Work during monsoon near water bodies	Construction work at sections close to water bodies viz Nallah/Drain shall be avoided during monsoon or completed before monsoon.	Project requirement	During Construction	Contractor	PMC/PMC
Inspection of site	Daily inspection at construction site should be carried out to ensure removal of construction debris	MORTH 301.3	During Construction Phase	Contractor/PMC	PMC
Earthwork debris disposal	As soon as construction is over the surplus earth should be utilized to fill up low-lying areas or the dumping area identified by PCMC. In no case, loose earth should be allowed to pile up along Project alignment.	MORT&H 301.3	During Construction Phase	Contractor/PMC	PMC
Debris Disposal	Debris generated due to dismantling of existing pavement/structures shall be suitably reused in proposed construction. Unutilisable debris shall be suitably disposed at the site identified by the	MORTH 301.3	During Construction	Contractor	PMC/PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
	Engineer i.e. or at locations approved by PMC/PMC / PCMC. Good disposal practices recommended by various agencies/authorities shall be followed.				
Soil contamination by construction wastes, fuel etc.	Oil and fuel spills from construction equipment shall be minimized by good O & M practice. Soils contaminated by such spills shall be disposed as per MoEF requirements.	Project requirement	During Construction	Contractor/PMC	PMC
Sourcing Quarry materials	Sand, aggregates and other quarry material shall be sourced from licensed quarries	MORTH 111.3	During Construction	Contractor/PMC	PMC
Aesthetics and Landscape	Adequate landscaping of the median, embankment slopes and other open space available within ROW shall be carried out as per the directions of PMC/PMC. The area can be utilized for growing dwarf varieties of plants (e.g. Alstonia Scholaris, Thuja etc).	Project Requirement	During fag end of construction phase or within 6 months after operation starts and before monsoon	Contractor/PMC	PMC
Providing labour camps and facilities	The Contractor shall abide by the Contract conditions and directions of PMC/PMC with respect to siting of labour camps, providing sanitation facilities and labour welfare issues etc.	MORTH 105.2	During Construction	Contractor/PMC	PMC
Occupational Health and Safety	The Contractor is required to comply with all the precautions as required for the safety of workmen as per the International Labour Organization (ILO) convention No. 62 as far as those are applicable to the Contract.	MORTH 105.2	During Construction	Contractor/PMC	PMC

Environmental Issue	*Mitigation Measures*	*Cross Reference to Documents*	*Time Frame*	*Responsibility*	
				Implementation	*Supervision*
Provision of Safety accessories/appliances to each worker	The Contractor shall supply all necessary safety appliances such as safety goggles, helmets, safety belts, ear plugs, masks etc. to the worker and staff.	MORTH 105.2	During Construction	Contractor/PMC	PMC
Safety Precautions	Adequate precautions shall be taken to prevent danger from electrical equipment. All machines / equipment used shall confirm to the relevant Indian standards (IS) codes and shall be regularly inspected by the PMC.	-	During Construction	Contractor/PMC	PMC
Availability of first aid kit at construction site	A readily available first aid unit including an adequate supply of sterilized dressing material and appliances shall be provided as per the requirement under the Factory Act.	MORTH 105.2 -	During Construction	Contractor/PMC	PMC
Workers health and hygiene	All anti-malarial measures as prescribed by the PMC shall be complied with, including filling up of burrow pits.	MORTH 105.2	During Construction	Contractor/PMC	PMC

Note: PMC – Project Management Consultant; PCMC – Pimpri Chinchwad Municipal Corporation; MORTH – Ministry of Road Transportation and Highways (formerly Ministry of Surface Transport, MOST Specifications for Road and Bridge Works, 3rd Revision, 1997); RAP – Rehabilitation Action Plan; R & R – Resettlement & Rehabilitation; CEMP – Community Environmental Management Plan; DG Sets – Diesel Generator set; ROW – Right of Way; PROW – Proposed Right of Way; O & M – Operation and Maintenance;

Environmental Monitoring Plan

Environmental Component	Project Stage	Parameters	Standard	Location	Frequency	Duration	Institutional Responsibility	
							Implementation	Supervision
Air Quality	Construction	SPM, PM_{10}, SO_2, NOx	NAAQS of CPCB	Existing Pune Mumbai Highway & Pimpri Chinchwad Link Road	Twice a Week	24-hr average sampling	Contractor	PMC/PMC
		CO, HC	NAAQS of CPCB	Existing Pune Mumbai Highway & Pimpri Chinchwad Link Road	Twice a Week	8-hr sampling	Contractor	PMC/PMC
Noise Level	Construction	Leq, L10, L50, L90 dB(A)	CPCB noise standards	At sensitive and residential locations located near construction equipment	At start of construction activity, followed by every quarter during construction period	Hourly day and night time Leg levels	Contractor	PMC/PMC

Environmental Component	Project Stage	Parameters	Standard	Location	Frequency	Duration	Institutional Responsibility	
							Implementation	Supervision
Water Quality	Construction	Drinking water parameters as per IS 10500.		Pawana River & Bore well samples located near to alignment of project	every quarter during construction period		Contractor	PMC/PMC
Ecology	Pre-construction	Monitoring of tree felling.	As laid out in project detail design. Trees to be adequately marked for felling.	At locations of Tree felling	During tree felling	--	Contractor through pre-approved monitoring agency	PMC, PCMC
	Operation	Survival rate of road side plantation and other compensatory plantation	Survival rate to be at-least 70%. Below which re-plantation should be done.	At locations of compensatory plantation	Annual	For 3 years after operation starts	PMC / Contractor	PCMC

Conducting Tests/Monitoring shall be carried out by contractor through his own laboratory, established at the project site. The Laboratory should be full-fledged with all testing equipment required to carry out the requisite testing according to its standards. After Completion of the project, the laboratory along with testing equipments in working condition shall be handed over to PCMC in good working condition without any extra cost to PCMC. The same shall be the property of PCMC.

11.7.3 Awareness & Training

Training and human resource development is an important link to achieve sustainable operation of the facility and environmental management. For successful functioning of the project, relevant EMP should be communicated during constructional phases to all concerned staff of contractors as well staff of PCMC/PMC.

11.7.4 Record Keeping & Reporting

Record keeping and reporting of performance is an important management tool. Records should be maintained for regulatory, monitoring and operational issues. Typical record keeping requirements is summarized in following table.

Parameter	Particulars
Solid Waste Handling & Disposal	• Daily quantity of waste received • Daily quantity treated and recycled • Daily quantity sold
Regulatory Licenses (Environmental)	• Environmental Permits / Consents from MPCB / MoEF (if required) • Copy of Waste manifests as per requirement
Monitoring & Survey	• Records of all monitoring carried out as per the finalized monitoring protocol.
Other	• Log book of compliance • Employee environmental, health and safety records • Equipment inspection & calibration records, where applicable • Vehicle maintenance and inspection records

11.7.5 Environmental Audits & Corrective Action Plans

To assess whether the implemented EMP is adequate, periodic environmental audits shall be conducted by Environment Cell of PCMC. These audits shall be followed by Corrective Action Plans (CAP) to correct various issues identified during the audits.

Environmentally Responsible Construction Practices

EMP Identification	Activity	Measures
EMP-CON-1	River/Rail/Road Crossings	• Construction shall be expedited and use of equipment and mainline construction activities within rivers shall be limited to minimum • River crossings shall be constructed as perpendicular to the axis of the river as far as practicable • All material and structures related to construction shall be cleared from the river and it's vicinity after construction • The mud and drilling fluids generated during the drilling operations shall be

EMP Identification	Activity	Measures
		disposed-of in an approved manner • Spill prevention and control measures shall be taken. No storage of oil or lubricants shall be located near river or drains feeding the rivers.
EMP-CON-2	Top Soil Preservation	• Topsoil shall be segregated during trenching and stacked separately • Topsoil shall not be used for padding, backfill or trench breakers • Topsoil shall be stacked on the non traffic side of the trench • At the completion of construction, topsoil shall be spread on top of the trench
EMP-CON-3	Trench Dewatering	• Hoses used for dewatering shall not touch the trench bottom • Screens and filters shall be used to avoid pumping of sediments • Discharge of trench water or other forms of turbid water directly onto exposed soil or into any water body shall be avoided
EMP-CON-4	Backfilling	• Excavated and blast rock shall be used as backfill above the layer of padding • A crown of soil shall be kept to allow for future settling • Excess or unsuitable material shall be cleared from the site and disposed of at an approved location
EMP-CON-5	Restoration	• Disturbed land shall be brought back to near original condition as soon as the construction activities are completed. • Landowners shall be allowed to cultivate land after restoration • Final grading shall be completed as soon as possible • After the trench is backfilled, rock which cannot be buried or hauled away shall be used for the soil erosion control measures and construction debris and other wastes shall be cleared from the ROW • ROW shall be graded to preconstruction contours, as practical, with a small crown of soft soil left over the trench to allow for future settlement • Fences and other facilities cut across during construction shall be repaired
EMP-CON-6	Hydrostatic Testing	• The potential environmental impacts from the withdrawal and discharge of hydrostatic testing water shall be minimized by recycling water during the testing of each stretch, if possible • Test water shall be disposed of in accordance with the requirements of the regulatory authorities • Test water shall be discharged back into the water body adopting soil erosion control measures

EMP Identification	Activity	Measures
EMP-CON-7	Special Precautions	• Precautionary measures shall be taken at tectonically active areas such as folds and faults, if any, en-route the BRTS. • Sand, aggregates and other quarry materials should be sourced from local authorised and licensed quarries • Creation of temporary tracks of trucks shall be avoided to the extent possible. However, in case truck tracks are made, the same shall be reinstated to its near original condition

Preservation of Environmental Quality

EMP Identification	Environmental Component	EMP Measures
EMP-EQ-1	Air Environment	• Particulate emissions shall be controlled by water sprinkling wherever necessary. • Operation of temporary Concrete, Asphalt and Hot Mix Plants shall adhere to relevant emission norms of MoEF. • All vehicles shall have valid PUC certificate. • All DG sets shall meet emission norms. • On-site burning of construction wastes shall be prohibited • Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be carried in vehicles fitted with cover lids • Excavated materials shall be placed in the designated dumping/disposal areas. • The heights from which materials are dropped shall be limited to 1.5 m. to limit fugitive dust generation • All motorized vehicles on katcha roads on the site shall be allowed a maximum speed of 15 kilometres per hour.
EMP-EQ-2	Noise Environment	• Modern “quiet-running” equipment shall be used wherever available. • Each item of powered machinery used on site shall be properly maintained and serviced so as to minimize noise emissions • Earmuffs shall be provided to operators of heavy construction equipment • Stationary equipment shall be located so as to minimize noise impact on the community. • Equipment and plant shall not be kept idling when not in use.
		• Plant and equipment known to emit noise strongly in one direction shall be oriented where possible, in a direction away from noise sensitive receptor
EMP-EQ-3	Water Environment	• Liquid effluents from construction camps and spoiled/drained lubricant oil washings from construction
EMP	**Environmental**	**EMP Measures**

Identification	Component	
		machinery shall not be discharged to any water body without treatment • Temporary drainage channels shall be provided to minimize soil erosion. • Water used in washing and flushing pipelines shall be discharged into storm water drains or natural drains after settling.
EMP-EQ-4	Land Environment	• All construction equipment and material shall be stored in a neat and orderly manner. • Any excess excavated material shall be removed from the construction site as soon as possible after the completion of excavation operations. • If any soil compaction occur outside embankment area within or outside the ROW due to movement/parking of heavy machinery, the top soil shall be ripped lightly prior to leaving the stretch • Excavated top soil shall be preserved near the trench • Land shall be reinstated after laying the Roads using the preserved top soil • Any kind of material resulting from clearing and grading shall not be deposited on temporary or permanent basis in the approach roads, railways, streams, ditches and any other position which may hinder the passage and/or natural water drainage • Barriers or other structures shall be provided in steep slope areas to prevent the removed material sliding downhill from ROW.
		• Temporary sanitary facilities shall be provided for workmen by locating the facilities in an inconspicuous place as possible. These facilities shall be maintained in a clean, odour-free condition at all times taking care to avoid soil and groundwater contamination. • Cutting recently built or resurfaced roads shall be avoided except when this is essential for emergency repair. To facilitate this practice, the authority shall maintain close coordination with the agencies regarding their street resurfacing programs.
EMP-EQ-5	Biological Environment	• The vegetation shall be cut off at ground level leaving the roots intact to the maximum extent possible. Only stumps and roots directly over the trench would be removed Precautions shall be taken to minimize damage to native plants on the periphery of construction area • Minimum number of trees shall be cut while building road. Equal number of trees shall be planted under compensatory a forestation • Removing vegetation outside ROW shall be strictly prohibited

AMENDED VOLUME II

INTERNATIONAL COMPETITIVE BIDDING

Design and Construction of Bridge on Pawana River, Flyover / Viaduct and ROB with Approaches & Ramps on Kalewadi Phata to Dehu Alandi Road.

Amended VOLUME – II

Pimpri Chinchwad Municipal Corporation
Pimpri, Pune – 411 018.

May–2010

Design and Construction of Bridge on Pawana River, Flyover/Viaduct and ROB with Approaches & Ramps on Kalewadi Phata to Dehu Alandi Road. Estate.

Amended VOLUME II

SECTION VI

Employers Requirements

INDEX

Units, Abbreviations & Terminology Used

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

Bus Rapid Transit System	BRTS
General Arrangement Drawing	GAD
General Conditions of Contract	GCC
Government of Maharashtra	GOM
Indian National Rupees	INR
Jawaharlal Nehru National Urban Renewal Mission	JNNURM
Kilometer	km
Ministry of Road Transport and Highway	MORT&H
National Highway	NH
National Highway Authority of India	NHAI
Number	No.
Particular Conditions	PC
Pimpri Chinchwad Municipal Corporation	PCMC
Provisional Sum	PS
Public Work Department	PWD
Rail Over Bridge	ROB
Safe Bearing Capacity	SBC
State Bank of India Prime Lending Rate	SBI PLR

SECTION VI

EMPLOYER'S REQUIREMENTS

CHAPTER – I
PREAMBLE AND BROAD PROVISIONS

1.0 PREAMBLE

1.1 INTRODUCTION

Data provided here is tentative. It is provided in two parts – The Employers Requirements and Design Criteria. Bidder is advised to ascertain accurate facts and details from his own due diligence. Obligatory requirements given herein shall be followed scrupulously in design of the Highway and Structures. The modality of preparation and submission of design and drawings by the contractor and approval by the Engineer is given in "Design Criteria",

1.2 CONTRACTOR'S GENERAL ENGINEERING, DESIGN & PROCUREMENT OBLIGATIONS

The Contractor shall be solely responsible for the Engineering, Procurement and Design of the work and for the adequacy thereof. Contractor's responsibility in any way shall neither be diminished nor shall the Contractor's design approach be limited by the Employer's acceptance 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 Employer. The Work shall also include shifting of utilities, removal of electric poles, cutting and removal of trees, the details of which are given separately.

1.3 INSPECTION, QUALITY ASSURANCE AND QUALITY AUDIT

The Contractor shall permit access by the Employer, Engineer's Representative (ER) or its Quality Assurance Representatives 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 sub contractors where the works will be performed, having subcontracts or orders in the amount specified in Volume-I or more, in accordance with the Contractor's contractual arrangements with its Subcontractors and allow the Employer, ER or its QA Representative 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 these meets the quality standards and the specification; and

(c) perform activities with respect to civil works such as, but not limited to, survey, installation, commissioning, acceptance and other construction and/or operational activities. Each of the foregoing rights of access shall be conditional upon (i) Employer giving Contractor reasonable notice, (ii) the Employer and/or the QA Representatives 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.

2.0 BROAD PROVISIONS

2.1 DESCRIPTION OF PROJECT

The Project envisages Design and Construction of Bridge on Pawana River, Flyover/Viaduct and ROB with approaches & Ramps on Kalewadi Phata to Dehu Alandi Road including Noise Barriers and other related Infrastructure. The term Flyover project shall mentioned in this Section VI (Volume II) shall mean complete Project which includes all components of the work such as the Bridge on Pawana River, Flyover/Viaduct, ROB , Approaches, Ramps, the Staircases, and all related works.

For guidance of bidders, General Arrangement drawing (GAD) showing the arrangement of River Bridge ,Flyovers/Viaduct, ROB , Approaches and Ramps etc. along with Obligatory requirements, as contemplated by the Employer are attached. However the bid is to be awarded on the Contractor's own design complying with the various obligatory requirements indicated herein as well as in the Design Criteria. For these purpose obligatory details shown in the typical GAD drawings enclosed, certain salient parameters which have been specified herein and in the Design Criteria are mandatory requirements. All other details are to be taken as indicative. The Contractor's design should provide for specifications comparable or superior to those mentioned in the Volume-III and as shown in the drawings and provided for in the bid.

The requirements of the obligatory span and other spans for the Flyover shall be as indicated in the GAD enclosed in Volume - IV.

While the scope of work is described in different parts as above, the work shall include all such details of construction which are obviously and fairly intended and which may not have been referred to in these documents, but which are essential for the entire completion of the Works.

GAD prepared by the PCMC (as provided in Vol IV) through their Consultants are intended to give a fair idea of scope of work. The same are enclosed in Tender Document. However it should be clearly understood that

i. The Bidder is required to give lump sum offer based on **his own design** for the entire work - Structures, ramps, junction improvements, filling/grading of low lying areas wherever necessary, fittings / fixtures, ducts for street

lighting/electrical work, drainage work, road signages, markings, crash barriers, kerbs, noise barriers etc. as per detailed Employers requirements.

ii. The Bidder is deemed to have understood and visualized the nature and type of work contemplated with due consideration of qualitative and quantitative requirements of the job consistent with the site conditions, complexities of work which have a bearing on the actual execution/construction etc. While doing so, however, he **must** strictly adhere to salient parameters & obligatory requirement which are indicated herein later.

iii. The spans for ROB [obligatory span] on Central Railway corridor are as per approval by Central Railway and are mandatory. The concrete pavement, service roads and BRTS lanes at grade of old Mumbai-Pune Road shall remain unchanged.

SECTION VI

EMPLOYER'S REQUIREMENTS

CHAPTER – II
EMPLOYERS REQUIREMENT IN DETAIL

Employers Requirement in Detail

The Flyover project is proposed on 45 m wide DP road for continuous connectivity over natural barriers. The proposed flyover provides facility for crossing the existing Pawana River , 18 m DP Road , Pimpri – Chinchwad Link road , Mumbai-Pune Railway Line & Existing 61m wide Pune Mumbai Road etc.

The Components of the Project are as follows. The Components are shown in the drawing, key plan for Components of the Drawing Volume IV of IV for reference.

Component No.	Description of the Component
	Six Lane Flyover/Viaduct crossing the Pawana River, 18 M DP Road , Existing Pimpri Chinchwad Link Road ,Central Railway Line of Mumbai Pune Rail , Existing 61m wide Pune Mumbai Road (NH-4) and landing after NH4 on DP Road with approaches and ramps. The Details of Each Component is mentioned below.
1	**Bridge on Pawana River: -** The River Bridge consists of two separate individual carriageways with overall width of 14.95 m each with central median. The individual carriageway of River Bridge Portion consist Kerb, crash barrier and railing between Ch 3+010 to Ch 3+130. The Approach with returns for River Bridge will start From Ch 2+800 on Kalewadi Side and ends at Ch 3+010 of River bridge. The Approach Portion consists of two separate individual carriageways with overall width of 13.15 m each with central median. The individual carriageway of approach Portion consist Kerb, crash barrier and railing between Ch 2+800 to Ch 3+010.
2	**Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road: -** The flyover/viaduct consists of two separate individual carriageway with overall width of 13.45 m each with Kerb , Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier of outer sides of individual carriageway in between Ch 3+130 to Ch 3+616. The portion between two individual carriageways of flyover/Viaduct is varying between Ch 3+130 to Ch 3+568. This portion is varying to accommodate the space required for proposed elevated bus stop. The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e 4 Sides) in between Ch 3+130 to Ch 3+568. The Noise Barriers mounted on crash barrier at outer sides of each individual

	carriageway (i.e. 2 Sides) in between Ch 3+568 to Ch 3+616.
3	**ROB on Central Railway -Mumbai Pune Railway Line: -** The ROB consists of two separate individual carriageways with overall width of 15.30 m each with central median. The individual carriageway of ROB Portion consist Kerb, crash barrier and railing between Ch 3+616 to Ch 3+653.20. Retaining Wall on one side of required length is to be constructed for retaining the existing slope of the shunting track while excavating the foundation along the rail line on Pune Mumbai within ROW.
4	**Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4) with approach: -** The flyover/viaduct consists of two separate individual carriageways with varying overall width as described below in between Ch 3+653.20 to Ch 4+393. The flyover/viaduct consists of two separate individual carriageways with overall width of 13.45 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+653.20 to Ch 3+707. The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e. 2 Sides) in between Ch 3+653.20 to Ch 3+707. The flyover/viaduct consists of two separate individual carriageways with overall width of reducing from 13.45 m to 11.65 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+707 to Ch 3+760. The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e 2 Sides) in between Ch 3+707 to Ch 3+760. The flyover/viaduct consists of two separate individual carriageways with overall width of 11.65 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+760 to Ch 4+097. The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e. 2 Sides) in between Ch 3+760 to Ch 4+097.

	The flyover/viaduct consists of two separate individual carriageways with overall width of increasing from 11.65 m to 13.45 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway between Ch 4+097 to Ch 4+172. The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e 4 Sides) in between Ch 4+097 to Ch 4+172. The flyover/viaduct consists of two separate individual carriageways with overall width of 13.45 m each with Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway between Ch 4+172 to Ch 4+393. This portion between two individual carriageways of flyover/Viaduct is varying between Ch 4+097 to Ch 4+393. This portion is varying to accommodate the space required for proposed elevated bus stop. The Approach of flyover/viaduct of Reinforced Earth will be at end after Viaduct portion towards KSB Chowk Side between Ch 4+293 to Ch 4+393. The Reinforced Earth Portion between Ch 4+ 293 to Ch 4+340 consists of two separate carriageways of 13.45 m each with Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway. The balance Reinforced Earth Portion consists of two separate carriageways of 13.15 m each with central median. The individual carriageway of Reinforced Earth Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway. Between Ch 4+340 to Ch 4+393. The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e. 4 Sides) in between Ch 4+172 to Ch 4+393.
5	**Descending Ramp on Left of the Main Carriageway in Empire Estate Area -Ramp 1 (Left)** branching out between ROB and NH-4 Road in the Empire Estate Area. The Descending Ramp Portion consists of carriageway with overall width of 5.050 m with crash barrier on both sides of carriageway. The Branching out of ramp starts from Ch. 3+675 to 3+705 with leveled portion on viaduct of main flyover. The descending portion of Viaduct Starts from Ch. 3+705 and ends at Ch. 3+997. The Approach of Reinforced Earth will start at the end of Viaduct portion Ch 3+997 towards Pune Mumbai road up to Ch 4+110.

6	**Ascending Ramp on Right of the Main Carriageway in Empire Estate Area -Ramp 2 (Right)** branching in between NH-4 Road and ROB in the Empire Estate Area. The ascending Ramp Portion consists of carriageway with overall width with crash barrier on both sides of carriageway. The Approach of Reinforced Earth will start from Ch 4+110 towards the Viaduct portion up to Ch.3+997. The ascending ramp with viaduct portion Starts from Ch. 3+997 and meets to main flyover at Ch. 3+705.The Branching in of ramp starts from Ch. 3+705 to Ch. 3+675 with leveled portion on viaduct and joins to main flyover/viaduct.
7	**Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road with approach & Landing in front of proposed City Centre -Ramp 3 (Left)** branching out after crossing of existing Mumbai Pune Road. The descending Ramp Portion consists of carriageway with overall width of 8.40 m with crash barrier on both sides of carriageway. The Branching out of ramp starts from Ch.0+000(Ch. 4+243 of flyover) to 0 + 030 with leveled portion. The descending portion of ramp Starts from Ch. 0+030 and ends at Ch. 0+162. The descending viaduct portion of ramp Starts from Ch. 0+000 and ends at Ch. 0+080. The Approach of Reinforced Earth will be at end after Viaduct portion in front of proposed City Centre on Planned 12 m DP Road between Ch 0+080 to Ch 0+162.
8	**Pedestrian Facilities such as Cycle cum pedestrian footpaths/ Track, & Staircase.** The raised Pedestrian Footpath with cycle track of 3.65 m wide is to be provided on Pawana River Bridge and Rail Over Bridge in the individual carriageway. The raised Pedestrian Footpath cum cycle track of 1.60 m wide is to be provided on balance length of flyover/Viaduct portion in the individual carriageway. Eight numbers of individual dog legged staircases of 3.00 m clear width and landing at each corner is to be provided at Pawana River Bridge and Rail Over Bridge.
9	**Construction/Improvement to the remaining portion below the flyover of main Concrete Carriageway of Pune Mumbai road.** At present the road below the flyover of length 85 m on each carriageway of width 9.00 m is in the flexible pavement condition. After construction of flyover/viaduct portion this length of flexible pavement has to be removed and rebuilt with rigid pavement i.e PQC of area 765 sqm on each carriageway & other crust stated in employers requirements matching to the existing profile of carriageway.

	Construction /Improvement of road for Connecting service road of existing Pune Mumbai Highway from the start /end of ascending /descending ramps in the Empire Estate Area. After construction of ramps the connection to existing Pune Mumbai Service Road is to be provided with flexible pavement & other crust stated in requirement matching to existing profile of carriageway.
10	Road markings, signage, and road furniture.
11	Traffic Diversion and Management.

The Detailed Employer's requirement in respect of the components of the project as mentioned above is as follows,

Six Lane Flyover crossing the Pawana River, 18 M DP Road , Existing Pimpri Chinchwad Link Road ,Central Railway Line of Mumbai Pune , Existing 61m wide Pune Mumbai Road (NH-4) and landing after NH4 on 45 m wide DP Road . The Details of Each Component is mentioned below.

The components of this main Flyover are,

a. The Solid Approaches portion on either end of the Flyover/Viaduct.
b. The Pawana River Bridge portion
c. The flyover/Viaduct Portion from the Pawana River Bridge to ROB.
d. The Railway Over-Bridge
e. The flyover/viaduct Portion from the ROB with crossing existing Mumbai Pune Road and Landing on 45 M wide DP Road.
f. The two separate ramps for descending and ascending on both sides of the Flyover/viaduct in between ROB & Pune Mumbai Road in the Empire Estate Area.
g. A separate descending Ramp after existing NH-4 (Pune Mumbai) Road.

Component 1:

Bridge on Pawana River: - The River Bridge consists of two separate individual carriageways with overall width of 14.95 m each with central median. The individual carriageway of River Bridge Portion consist Kerb, crash barrier and railing between Ch 3+010 to Ch 3+130. The Approach with returns for River Bridge will start From Ch 2+800 on Kalewadi Side and ends at Ch 3+010 of River Bridge. The Approach Portion consists of two separate individual carriageways with overall width of 13.15 m each with central median. The individual carriageway of approach Portion consist Kerb, crash barrier and railing between Ch 2+800 to Ch 3+010.

The Details of the Work involved in Component 1:-

- River Bridge as mentioned above including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, Railings, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Solid ramps at the start of River bridge Abutments from 2+800 to 3+010
- Retaining structure for Solid ramps with reinforced earth.
- Construction of foundations includes necessary all temporary arrangements such as diversions, clear water way, floating platform, dewatering, cofferdams, coordination with concerned dept. etc.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading if required in the entire area of River Bridge with Type of Barricading described in Annexure-3 of Design Data.
- Construction of footpaths & Pedestrian Paths with Paver blocks along the River Bridge as per the design data and Typical Cross Sections in Tender Drawings (Volume IV).
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- The Staging and centering arrangement required to execute the work.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Smooth matching of the Ramp on Kalewadi side end near Chainage 2+800 with the existing Carriageway for a length of at least 50m from touch down point. The crust shall be as per the design data hereunder.
- Construction of facility for carrying Utilities lines all along the river bridge, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements. For this purpose a Separate Cantilever bracket system outside the overall deck width is to be provided with structure. For this load of 900 mm dia. M.S. water pipe line with 10 mm thick lining in CM 1:1 is to be considered.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the river bridge for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.

Component 2:

Continuous flyover/viaduct from Pawana River Bridge up to Rail Over Bridge (ROB) crossing 18 m DP road & existing Pimpri Chinchwad Link Road: - The flyover/viaduct consists of two separate individual carriageway with overall width of 13.45 m each with Kerb , Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier of outer sides of individual carriageway in between Ch 3+130 to Ch 3+616. The portion between two individual carriageways of flyover/Viaduct is varying between Ch 3+130 to Ch 3+568. This portion is varying to accommodate the space required for proposed elevated bus stop.

The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e. 4 Sides) in between Ch 3+130 to Ch 3+568.

The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e. 2 Sides) in between Ch 3+568 to Ch 3+616.

The Details of the Work involved in Component 2:-

- Flyover Up to ROB as mentioned above including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Construction of foundations includes necessary all temporary arrangements such as diversions, dewatering, shoring and strutting etc.
- Reinforced Earth Section is not permitted in this component.
- Providing and Erection of Noise barrier mounted on crash barriers of flyover/viaduct portion.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading of the entire area of Flyover/viaduct with Type of Barricading described in Annexure-3 of Design Data.
- Construction of Cycle Track/Pedestrian Paths with Paver blocks along the flyover as per the design data and Typical Cross Sections in Tender Drawings (Volume IV).
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the adjacent roads excavated for the purpose of construction. The carriageway capacity of the existing roads adjacent to the Flyover shall be maintained to same configuration as per existing.

- The Staging and centering arrangement such as to maintain the existing lane configuration of the road below obligatory spans, viaduct spans and complete stretch.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Clearing the existing corridor of all encroachments after relocation of existing encroachment if any.
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest existing Storm water line by laying underground pipelines or as per instruction of Engineer in Charge.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Construction of facility for carrying Utilities lines all along the Flyover, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the Flyover for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.
- The scope of elevated Bus Stop with its structure is not part of this component.
- The scope of service road below the flyover/viaduct with its utilities such Storm water Drain, Drainage Line and other utility is not part of this component.

Component 3:

ROB on Central Railway Mumbai Pune Railway Line: - The ROB consists of two separate individual carriageways with overall width of 15.30 m each with central median. The individual carriageway of ROB Portion consist Kerb, crash barrier and railing between Ch 3+616 to Ch 3+653.20. Retaining Wall on one side of required length is to be constructed for retaining the existing slope of the shunting track while excavating the foundation along the rail line on Pune Mumbai with in ROW.

The Details of the Work involved in Component 3:-

- Rail over Bridge (ROB) as mentioned above including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, Railings, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Construction of foundations includes necessary all temporary arrangements such as dewatering, shoring and strutting, coordination with railway etc.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.

- Barricading of the entire area of ROB if necessary with Type of Barricading described in Annexure-3 of Design Data.
- Construction of Cycle Track & Pedestrian Paths with Paver blocks along the flyover as per the design data and Typical Cross Sections in Tender Drawings (Volume IV).
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the adjacent roads excavated for the purpose of construction. The carriageway capacity of the existing roads adjacent to the ROB shall be maintained to same configuration as per existing.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest existing storm water line by laying underground pipelines or as per instruction of Engineer in Charge.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Construction of facility for carrying Utilities lines all along the ROB, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the ROB for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.
- Construction of Retaining Wall to protect the existing rail line as shown in GAD. Retaining Wall on one side of required length is to be constructed for retaining the existing slope of the shunting track while excavating the foundation along the rail line on Pune Mumbai within ROW
- Coordination and obtaining necessary approval from the railway authority.

Component 4:

Continuous flyover/viaduct from Rail Over Bridge with Crossing of Existing 61 M wide Pune Mumbai Road (NH-4): -

The flyover/viaduct consists of two separate individual carriageways with varying overall width as described below in between Ch 3+653.20 to Ch 4+393.

The flyover/viaduct consists of two separate individual carriageways with overall width of 13.45 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+653.20 to Ch 3+707.

The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e 2 Sides) in between Ch 3+653.20 to Ch 3+707.

The flyover/viaduct consists of two separate individual carriageways with overall width of reducing from 13.45 m to 11.65 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+707 to Ch 3+760.

The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e 2 Sides) in between Ch 3+707 to Ch 3+760.

The flyover/viaduct consists of two separate individual carriageways with overall width of 11.65 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides only of individual carriageway between Ch 3+760 to Ch 4+097.

The Noise Barriers mounted on crash barrier at outer sides only of individual carriageway (i.e 2 Sides) in between Ch 3+760 to Ch 4+097.

The flyover/viaduct consists of two separate individual carriageways with overall width of increasing from 11.65 m to 13.45 m each with central median. The individual carriageway of flyover/viaduct Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway between Ch 4+097 to Ch 4+172.

The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e 4 Sides) in between Ch 4+097 to Ch 4+172.

The flyover/viaduct consists of two separate individual carriageways with overall width of 13.45 m each with Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway between Ch 4+172 to Ch 4+393.

This portion between two individual carriageways of flyover/Viaduct is varying between Ch 4+097 to Ch 4+393. This portion is varying to accommodate the space required for proposed elevated bus stop.

The Approach of flyover/viaduct of Reinforced Earth will be at end after Viaduct portion towards KSB Chowk Side between Ch 4+293 to Ch 4+393. The Reinforced Earth Portion between Ch 4+ 293 to Ch 4+340 consists of two separate carriageways of 13.45 m each with Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway.

The balance Reinforced Earth Portion consists of two separate carriageways of 13.15 m each with central median. The individual carriageway of Reinforced Earth Portion consist Kerb, Crash Barrier in between M V Lane & Cycle track/pedestrian path & Noise Barriers mounted on crash barrier at outer sides of each individual carriageway.

between Ch 4+340 to Ch 4+393.

The Noise Barriers mounted on crash barrier at outer sides of each individual carriageway (i.e. 4 Sides) in between Ch 4+172 to Ch 4+393.

The Details of the Work involved in Component 4:-

- Flyover from ROB with crossing of existing Pune Mumbai road as mentioned above including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Construction of foundations includes necessary all temporary arrangements such as diversions, dewatering, shoring and strutting etc
- Reinforced Earth Section is not permitted in this component except at the end of flyover/viaduct on KSB side between ch.4+293 to 4+393.
- Providing and Erection of Noise barrier mounted on crash barriers of flyover/viaduct portion.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading of the entire area of Flyover with Type of Barricading described in Annexure-3 of Design Data.
- Construction of Cycle Track/Pedestrian Paths with Paver blocks along the flyover as per the design data and Typical Cross Sections in Tender Drawings (Volume IV).
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the adjacent roads excavated for the purpose of construction. The carriageway capacity of the

existing roads adjacent to the Flyover shall be maintained to same configuration as per existing.

- The Staging and centering arrangement such as to maintain the existing lane configuration of the road below obligatory spans, viaduct spans and complete stretch.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Clearing the existing corridor of all encroachments after relocation of existing encroachment if any.
- Reinstating existing median and kerb lines of existing footpaths and carriageways
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest existing Storm water line by laying underground pipelines or as directed by Engineer in charge.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Construction of facility for carrying Utilities lines all along the Flyover, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the Flyover for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.

Component 5:

Descending Ramp on Left of the Main Carriageway in Empire Estate Area - **Ramp 1 (Left)** branching out between ROB and NH-4 Road in the Empire Estate Area. The Descending Ramp Portion consists of carriageway with overall width of 5.050 m with crash barrier on both sides of carriageway. The Branching out of ramp starts from Ch. 3+675 to 3+705 with leveled portion on viaduct of main flyover. The descending portion of Viaduct Starts from Ch. 3+705 and ends at Ch. 3+997. The Approach of Reinforced Earth will start at the end of Viaduct portion Ch 3+997 towards Pune Mumbai road up to Ch 4+110.

The Details of the Work involved in Component 5:-

- Ramps including Viaduct and Solid Ramp portion of R.E. Walls including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Construction of foundations includes necessary all temporary arrangements such as diversions, dewatering, shoring and strutting etc
- Reinforced earth section is not permitted in this section except Solid ramp portion.

- Solid ramps behind Abutments from @ Ch: 3+997 to 4+110.
- Reinforced Earth Wall for Solid ramps.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading of the entire area of ramps with Type of Barricading described in Annexure-3 of Design Data.
- Development of Junction at service road level with Pune Mumbai road as per IRC standards.
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the existing roads excavated for foundation or for any other purpose. The carriageway capacity of the existing roads below the Flyover shall be maintained to same configuration as per existing.
- The Staging and centering arrangement such as to maintain the existing lane configuration of the existing road.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery. as directed by the Engineer in Charge.
- Clearing the existing corridor of all encroachments after relocation of existing encroachment if any.
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest Storm water line by laying underground pipelines or as directed by the Engineer in Charge.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Smooth matching of the Ramps with service road connecting to Pune Mumbai Highway for a length of at least 50m from touch down point. The crust shall be as per the design data of this Volume.
- Construction of facility for carrying Utilities lines all along the Flyover, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the ramps for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.

Component 6:

Ascending Ramp on Right of the Main Carriageway in Empire Estate Area - Ramp 2 (Right) branching in between NH-4 Road and ROB in the Empire Estate

Area. The ascending Ramp Portion consists of carriageway with overall width of 5.050 m with crash barrier on both sides of carriageway. The Approach of Reinforced Earth will start from Ch 4+110 towards the Viaduct portion up to Ch.3+997. The ascending ramp with viaduct portion Starts from Ch. 3+997 and meets to main flyover at Ch. 3+705.The Branching in of ramp starts from Ch. 3+705 to Ch. 3+675 with leveled portion on viaduct and joins to main flyover/viaduct.

The Details of the Work involved in Component 6:-

- Ramps including Viaduct and Solid Ramp portion of R.E. Walls including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement.
- Construction of foundations includes necessary all temporary arrangements such as diversions, dewatering, shoring and strutting etc
- Reinforced earth section is not permitted in this section except Solid ramp portion.
- Solid ramps behind Abutments from @ Ch: 3+997 to 4+110.
- Reinforced Earth Wall for Solid ramps.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading of the entire area of ramps with Type of Barricading described in Annexure-3 of Design Data.
- Development of Junction at service road level with Pune Mumbai road as per IRC standards.
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the existing roads excavated for foundation or for any other purpose. The carriageway capacity of the existing roads below the Flyover shall be maintained to same configuration as per existing.
- The Staging and centering arrangement such as to maintain the existing lane configuration of the existing road.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Clearing the existing corridor of all encroachments after relocation of existing encroachment if any.
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest Storm water line by laying underground pipelines or as directed by Engineer in Charge.

- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Smooth matching of the Ramps with service road connecting to Pune Mumbai road for a length of at least 50m from touch down point. The crust shall be as per the design data of this Volume.
- Construction of facility for carrying Utilities lines all along the Flyover, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the ramps for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.

Component 7:

Descending Ramp on Left of the Main Carriageway after crossing Existing Mumbai Pune Road -**Ramp 3 (Left)** branching out after crossing of existing Mumbai Pune Road. The descending Ramp Portion consists of carriageway with overall width of 8.40 m with crash barrier on both sides of carriageway. The Branching out of ramp starts from Ch.0+000(Ch. 4+243 of flyover) to 0 + 030 with leveled portion. The descending portion of ramp Starts from Ch. 0+030 and ends at Ch. 0+162. The descending viaduct portion of ramp Starts from Ch. 0+000 and ends at Ch. 0+080. The Approach of Reinforced Earth will be at end after Viaduct portion in front of proposed City Centre on Planned 12 m DP Road between Ch 0+080 to Ch 0+162.

The Details of the Work involved in Component 7:-

- Ramps including Viaduct and Solid Ramp portion of R.E. Walls including Foundations, Substructure, Superstructure, Wearing Coat, Crash Barriers, POT-PTFE Bearings, and all related works to conform to the Design Data mentioned in this Volume. Longitudinal Profile and horizontal geometry shall remain unchanged as shown in the Drawing Volume (Volume IV) as obligatory requirement. Modifications in the horizontal geometry may be permitted at the discretion of Engineer.
- Construction of foundations includes necessary all temporary arrangements such as diversions, dewatering, shoring and strutting etc
- Reinforced earth section is not permitted in this section except Solid ramp portion.
- Solid ramps behind Abutments from @ Ch:0+080 to 0+162
- Reinforced Earth Wall for Solid ramps.
- Traffic Management measures during construction to maintain unhindered smooth flow of traffic.
- Barricading of the entire area of ramps with Type of Barricading described in Annexure-3 of Design Data.

- Reinstating existing median and kerb lines of existing footpaths and carriageways.
- Road furniture including guard rails, Kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Rehabilitation, repair, re-construction and maintenance of the adjacent roads excavated for foundation or for any other purpose. The carriageway capacity of the existing roads adjacent to the Flyover shall be maintained to same configuration as per existing.
- The Staging and centering arrangement such as to maintain the existing lane configuration of the existing road.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery.
- Clearing the existing corridor of all encroachments after relocation of existing encroachment if any.
- Tree cutting and compensatory plantation. Transplantation of all eligible trees.
- Drainage spouts as per Standard IRC drawings including down take arrangement from wearing coat and connecting it to the nearest Storm water line by laying underground pipelines or as directed by Engineer In Charge.
- Wearing coat on completed Superstructure along with waterproofing membrane as per design data and specifications.
- Smooth matching of the Ramps with 12 M DP road Carriageway for a length of at least 50m from touch down point. The crust shall be as per the design data of this Volume.
- Construction of facility for carrying Utilities lines all along the Flyover, in anti-crash barriers, footpaths and any other suitable arrangements conforming to the Design requirements.
- Supply and Erection of Street Light Poles to satisfy the illumination requirements of the ramps for traffic, as per IRC, moving at design speed. All necessary cable laying, provision of junction boxes, earthling, light fixtures, lamps, fittings, Feeder pillars, transformer, switch yards, switchgear timers, etc. complete in all respect.

Component 8:

Pedestrian Facilities such as Cycle cum pedestrian footpaths/ Track, & Staircases.

The raised Pedestrian Footpath with cycle track of 3.65 m wide is to be provided on Pawana River Bridge and Rail Over Bridge in the individual carriageway.

The raised Pedestrian Footpath cum cycle track of 1.60 m wide is to be provided on balance length of flyover/Viaduct portion in the individual carriageway.

Eight numbers of individual dog legged staircases of 3.00 m clear width and landing at each corner is to be provided at Pawana River Bridge and Rail Over Bridge.

The proposed pedestrian facilities are to be provided for movement of pedestrians from any point to any point in the complete Flyover Project without direct conflict with the traffic.

The Details of the Work involved in Component 8:-

- Facilities for Pedestrians to ascend / descend the Flyover, cross the Mumbai Pune rail line& Pawana River mentioned below,

  Eight numbers of individual dog legged staircases of 3.00 m clear width and landing at each corner is to be provided at Pawana River Bridge and Rail Over Bridge as shown in the Drawing Volume IV of IV. One Individual unit for ascending and descending comprises of the following,

  a. One RCC Dog legged Staircase of 3.00 m clear width for ascending/descending.
  b. Polycarbonate sheeting with proper MS framework required for covering the pedestrian descending/ascending facility and platform/landing area from all sides with minimum vertical clearance of 2.4m from top of the platform/steps.
  c. MS Handrails for the RCC Staircase to be provided at both edges.
  d. Electrical arrangements for staircase.
  e. RCC Dog legged staircase shall have RCC framed structure, Tiling for landing & Treads and Risers painting, electrification, lighting etc. complete in all respects and specifications will be as directed by Engineer in Charge.
  f. The Rise and treads will be designed to facilitate comfort to the pedestrians or as directed by Engineer in Charge.

Component 9:

Construction/Improvement to the remaining portion below the flyover of main Concrete Carriageway of Pune Mumbai road.

At present the road below the flyover of length 85 m on each carriageway of width 9.00 m is in the flexible pavement condition. After construction of flyover/viaduct portion this length of flexible pavement has to be removed and rebuilt with rigid pavement i.e PQC of area 765 sqm on each carriageway & other crust stated in employers requirements matching to the existing profile of carriageway

Construction /Improvement of road for Connecting service road of existing Pune Mumbai Highway from the start /end of ascending /descending ramps in the Empire Estate Area.

After construction of ramps the connection to existing Pune Mumbai Service Road is to be provided with flexible pavement & other crust stated in requirement matching to existing profile of carriageway.

- Reinstating existing median and Kerb lines of existing footpaths
- Road furniture including guard rails, kerb painting, road marking (center and edge lines, pedestrian crossings, chevrons, arrows, stop lines etc.) and road signage (informatory, cautionary, mandatory signs, over head gantry and over hang cantilever signs.
- Traffic Management measures during construction.
- Demolition, cleaning and removal after relocation of encroachments and disposal of the muck including providing all men and machinery..
- Tree cutting and compensatory plantation. Transplantation of eligible trees.
- Construction of Paver block strips in carriageway (abutting existing concrete road) as per requirements.
- Construction of Water Entrances to Existing Storm water Drains.
- Provision of 4 rows of 300 mm dia. RCC pipes (NP3) for crossing of utilities at junctions and at 2 locations along the road.
- Smooth Matching of the Main Carriageway in horizontal alignment and vertical profile with the existing Carriageway for a length of at least 50m from end point. The crust shall be as per the design data hereunder.
- Smooth Matching of the Service Roads in horizontal alignment and vertical profile with the existing Carriageway for a length of at least 50m from end point. The crust shall be as per the design data hereunder.

Component 10:

Road Markings, Signages and Road Furniture.

Supply, installation and erection of Gantry Type Overhead Signages including Steel Framed structure, Signage boards 1.2m tall, Sheeting of ASTM type IX specifications, at following locations.

a. Before the start of the each Flyover
b. At Two locations along the each Flyover
c. After the end of the each Flyover

- Supply, installation and erection Gantry Type Overhead Signages including Steel Framed structure, Signage boards 1.2m tall, Sheeting of ASTM type IX specifications, at following locations.
    a. At starting points of all the Ramps, Ramp R-1 (Left), Ramp R-2 (Right), Ramp R-3 (Left),

- Supply, installation and erection of Cantilever Type Informatory Sign Boards including Steel Framed structure, Signage boards 1.2m tall and 2.4m wide, Sheeting of ASTM type IX specifications, at Five locations on each flyover.
- Supply, installation and erection of Cautionary, Mandatory and informatory sign boards at locations like curves, steep gradients, and low vertical clearances.
- All the Parking areas, Service roads, ramps, staircase, etc. shall have necessary cautionary, mandatory and informatory sign boards.
- The paved areas, service roads, Wearing Coat of Flyovers shall be ,Marked with Thermoplastic paint for,
    a. Edge markings
    b. Lane Markings,
    c. Direction arrows.
    d. Chevrons
    e. Stop Lines
    f. Pedestrian crossings
    g. Other necessary markings
    h. Kerb lines

Component 11:

Traffic Diversion and Management

- Installation of Barricades all along the Cordoned area where work is going on.
- Installation of warning signs blinkers and barricades as per Specifications in Volume III.
- Repair and maintenance of distress, potholes in existing roads to ensure smooth flow of traffic.
- The complete are traffic management during construction shall be such that at any given point of time the lane configuration available for existing traffic shall not be less than the existing carriageway configurations.
- Removal, shifting and rehabilitation of underground and overhead utilities shall be carried out through the approved agencies of concerned authorities under provisional sums.

While the scope of work is described in different parts/components as above, the work shall include all such details of construction which are obviously and fairly

intended and which may not have been referred to in these documents, but which are essential for the entire completion of the Works in view of construction of the flyover.

GAD prepared by the PCMC (as provided in Vol IV) through their Consultants are intended to give a fair idea of scope of work and Obligatory Requirements. It may please be noted here the span arrangements, horizontal and vertical geometry shown in drawings are mandatory. The same are enclosed in Tender Document. However it should be clearly understood that

i. The Bidder is required to give lump sum offer based on his own design for the entire work - Structures, ramps, junction improvements, fittings / fixtures, ducts for street lighting/electrical work, drainage work, road signages, markings, crash barriers, kerbs etc. as per detailed Employers requirements.

ii. The Bidder is deemed to have understood and visualized the nature and type of work contemplated with due consideration of qualitative and quantitative requirements of the job consistent with the site conditions, complexities of work which have a bearing on the actual execution/construction etc. While doing so, however, he must strictly adhere to salient parameters & obligatory requirement which are indicated herein later.

iii. The spans for ROB [obligatory span] on Central Railway corridor are as per approval by Central Railway and are mandatory. The concrete pavement, service roads and BRTS lanes at grade of old Mumbai-Pune Road shall remain unchanged.

SECTION VI

EMPLOYER'S REQUIREMENTS

CHAPTER – III
DESIGN CRITERIA FOR ROADS AND HIGHWAYS.

1.0 DESIGN DATA FOR ROADS/HIGHWAYS

S. No	Attributes	Standards
1	*Category of Road*	*Arterial*
2	*Design Speed*	*80 Km/Hr*
3	*Width* *Carriageway Lane*	• *11.5m for Mumbai Pune Road Service Roads* • *9m for Mumbai Pune Main Concrete Carriageway* • *Other Lane configurations as per Volume-IV Drawings*
4	*Edge Strip Adjacent to Median and Footpath Kerb*	*0.25m*
5	*Paved Shoulder*	*1.9 m (Max)* *1.5 m (Min)*
6	*Earthen/Granular Shoulder*	*1.0 m To 1.6m*
7	*Median*	*0.3 m To 1.00m*
8	*Footpath*	*4.5m for Mumbai Pune road Service Roads.*
9 *a*	*Camber* *Carriageway and Paved Shoulder* • *Rigid* • *Flexible* • *Over Flyover*	 *2.0 %* *2.5 %* *2.5 %*
b	*Earthen Shoulder*	*3.0 %*
10	*Maximum Super-Elevation -* *Road at Grade* *Over Elevated Corridor*	*5.0 %* *4.0 %*
11	*Longitudinal Gradient* • *Ruling* • *Limiting Gradient*	 *3.33 %* *4.5 % (in unavoidable circumstances)*

(i) Lane width on curves may be adjusted upwards according to traffic composition and degree of curve.

(ii) Minimum intersection turning radius shall be 25 m.

(iii) Super elevation run-off shall be at the rate of 1:150

(iv) Super elevation shall be as per provisions of IRC-86 and IRC-38.

2.0 GENERAL OBLIGATORY REQUIREMNTS:-

2.1 In the road construction obligatory requirements include

- Demolition and reconstruction of existing pavement in poor condition wherever required for construction of pier for elevated corridor.
- Design, plan and execute rigid pavement wherever damages due to construction of piers, locations of poor pavement condition, slip roads including restoring crust.
- Paver blocks in the footpath, rehabilitation of kerb and medians.
- Road furniture, lighting, landscaping for the entire length
- Removal, shifting and rehabilitation of underground and overhead utilities shall be carried out through the approved agencies of concerned authorities under provisional sums.

The Crust for the Proposed Service Road work and Approach (Solid) Ramp Portion shall be as follows.

	BRIEF DESCRIPTION		**Layer thickness**
a)	Subgrade with selected fill material having CBR >8%, complying with MoSRT&H specification. (Clause 305 of MoSRT&H specs.)	:	500 mm
b)	**Granular Sub Base (GSB)**	:	300 mm
	150 mm thick drainage layer of grade II metal (Table 400.2 MOSRT&H).		
	150 mm thick structural layer of grade II metal (Table 400.1 MOSRT&H).(Compacted with Vibratory Roller - a single layer thickness not to exceed 100 mm).		
c)	W.M.M. with graded crushed stone layers with single layer not exceeding 200 mm. (Clause 406 of MoSRT&H specs.) (Compacted with Vibratory Roller)	:	300 mm
d)	**Dense Bituminous Macadam** with a single layer not exceeding 50 - 100 mm, 60 / 70 grade bitumen @ 4.5% bitumen by weight of mix, graded aggregate as specified in MOSRT&H including prime coat (of 10 kg/10 Sq.m of 80 / 100 bitumen) and tack coats (5 kg / 10 Sq.m of 80 / 100 bitumen). (Compacted with Vibratory Roller) (Clause 507 of MoSRT&H specs.)	:	150 mm (in two layers of 75mm each)
e)	**Wearing coat of Bituminous Concrete** with minimum 5.5% Bitumen of 60/70 grade, single layer of 25 - 50 mm including tack coat (bitumen - 80 / 100) at 5 kg/10 Sq.m. (using lime as filler material, Compacted with Vibratory Roller) (Clause 512 of MoSRT&H specs.)	:	50 mm

The Crust for the Proposed Rigid Pavement Road work shall be as follows.

	BRIEF DESCRIPTION		Layer thickness
a)	Sub-grade with selected fill material having CBR >8%, complying with MoSRT&H specification. (Clause 305 of MoSRT&H specs.)	:	500 mm
b)	**Granular Sub Base (GSB)**	:	300 mm
	150 mm thick drainage layer of grade II metal (Table 400.2 MOSRT&H).		
	150 mm thick structural layer of grade II metal (Table 400.1 MOSRT&H).(Compacted with Vibratory Roller - a single layer thickness not to exceed 100 mm).		
c)	W.M.M. with graded crushed stone layers with single layer not exceeding 200 mm. (Clause 406 of MoSRT&H specs.) (Compacted with Vibratory Roller)	:	300 mm
d)	**Dry Lean Concrete sub base** including coarse and fine aggregate to the specified gradation using minimum cement content 150Kg /Cum of concrete with OPC 43 Grade cement, Mixing of concrete as per approved design mix using mechanized batch mix plant of appropriate capacity , transporting and laying to required levels and compacting with vibratory roller of minimum 80 - 100 KN static weight to give desired compacted density and average compressive strength of 10 MPa at 7 days and curing with liquid curing compound and sprinkling water and covering with moist Hessain or ponding of water.	:	150 mm
e)	**Pavement quality Concrete (PQC)** of M 40 grade including 125 micron thick impermeable plastic sheet membrane over the surface to be covered, coarse and fine aggregate of specified gradation using cement content ranging from 390 Kg / Cum to 425 Kg / Cum of concrete with OPC 43 grade cement approved admixture , mixing with mechanized batch plant of appropriate capacity as per the design mix to the specified workability, transporting the mix with transit mixers and laying with fixed form arrangement adjusted to the required levels, curing with approved resin based aluminized reflective curing compound having water retention efficiency index of 90% in accordance with BS specification No. 7542 with the help of manufacturer and including providing and fixing dowels as specified on cradle made of HYSD Bars, tie bars, approved Polysulphide cold pour seals for joint filling and sealing all types of joints and finishing to the desired surface texture.	:	300 mm

Providing wearing course over the bridge superstructures as follows: 50mm BC overlaid by 12mm Mastic as per MoSRT&H specifications. Merging of ramps /

loop with either service roads / main carriage way of Mumbai Pune road, etc. shall have road crusts similar to that solid ramps

Profile correction for camber, super elevation, and vertical curve shall be provided in deck itself.

2.2 Alignment and location

Alignment and location of the Flyover Structure and ROB shall be as shown in the Departmental drawings provided (Volume IV of IV). The Co-ordinates and levels shall be approved by The Engineer. The Bench Mark is located on the Compound wall after NH-4 near Empire Estate Area.

2.3 Geometrics

The Contractor's proposal shall provide for a River Bridge, ROB cum Flyover of length to suit the requirements of minimum horizontal and vertical clearances in the obligatory spans at junction and other obligatory requirements and gradient not steeper than those shown on the departmental drawing. The Contractor shall provide the Flyover conforming to these requirements and including properly designed horizontal & vertical curves for a design speed as per the **Design Criteria**

The radii of horizontal curves shall not be less than as shown in the departmental drawings. The minimum length of open structure portion shall not be less than those shown in the departmental drawings. The maximum height of solid ramp at abutment location shall not be more than those shown in the departmental drawings.

The Carriageway width for Flyover, ROB and ramp shall not be less than that shown in the departmental drawings (Volume IV of IV).

The retaining structure of the ramp shall be provided upto the inner half portion of the valley curve. In the remaining half portion of valley curve on the extreme end of Flyover merging with existing road, crash barriers shall be taken min. 30 cm below the top of existing road. The foundation of crash barriers in this portion shall rest at 60 cm below the existing road level.

All the junctions of Ramps with services roads connecting with Pune Mumbai Highway shall be designed as per IRC provisions for smooth & safe movement of traffic. The detailed planning and drawing shall be executed after approval by the Engineer.

2.4 Camber and Super Elevation

Minimum camber to be provided on the carriageway shall be 2% as shown in the departmental drawing. Super elevation wherever required shall be as per actual design subject to a maximum of 4%. The carriageway width of 9.00 & 11.00 m for Flyover as described in scope of work and has been decided considering movement of multi axle trailers with containers / oversized vehicles and traffic requirements and also extra widening required on curves. The widened width of carriageway at horizontal curves Shall be as per IRC.

2.5 Traffic Diversion

The Contractor may adopt a suitable traffic diversion scheme during construction which shall be got approved from local Traffic Police Department. The responsibility of obtaining the permissions for proposed traffic diversion from concerned authorities e.g. Traffic Police Department shall be that of the contractor.

Contractor shall enclose the scheme of construction of superstructure of main obligatory spans and ROB portion along with his technical proposal.

Programme of construction of the obligatory spans and ROB portion shall be arranged in such a way that it is completed in the shortest time period with least possible hindrance to traffic.

Providing and maintaining necessary traffic diversion, barricading of site during construction, providing necessary traffic safety measures etc as per provisions given in Special Conditions of Contract.

The existing Traffic of NH-4 shall be diverted on Service roads on NH-4 as per MoSRT&H requirements. This diversion shall be completed before start of Flyover work on NH-4.

2.6 Site Clearance / Setting Out:

Carrying out topographic survey and marking out the center line of the Flyover Bridge and various other components and complete lining out using concrete pillars for proper lines and levels with precision total survey, including constructing control stations, bench marks, etc. as directed. This includes all the allied works like clearing the road, other existing utilities like signals, electrical poles, telephone ducts, hoarding, etc. side line removing and stacking of the existing kerb stones, obstructing bushes, etc. cutting / relocating of trees as per list given in tender, as directed by Engineer. The surveying instruments used on the work shall be modern electronic equipment like precise total station. And all the levels should be referred to particular B.M value established on the on compound wall Platform as shown in the GAD.

2.7 Designs, Drawings and Documentation – Contract Drawings

The drawings provided with the tender are intended to give only a fair idea of the scope of work, while the offers are invited on the basis of design to be furnished by the Contractor. Hence, the drawings submitted by the Contractor along with his tender shall be treated as Contract Drawings subject to conditions laid down in the Contract.

The Contractor shall submit all detailed design for approval to the PCMC. Only after approval from PCMC the drawings shall be used for Construction.

2.8 Construction activities

It shall be noted by the Contractor that

i. The responsibility of obtaining necessary design and construction permission/s from appropriate authorities like PCMC/Central Railways/MoSRT&H etc., for all the construction activities including those for shifting any utilities etc., if required, shall be that of the contractor. PCMC will give necessary assistance to the Contractor.

ii. It shall be the Contractor's responsibility to see that there is no hindrance to existing traffic during Construction of Flyover and the roadway is free from

haphazardly stacked / thrown materials, pot-holes, muck, construction equipments etc. The area being tackled during construction shall be cordoned with Barricades self standing and having blinkers on them.

iii. It shall be contractor's responsibility that the scheme of construction shall be got approved from concerned authorities.

iv. The Contractor shall submit all detailed design for approval to the PCMC. Only after approval from PCMC the drawings shall be used for Construction.

2.9 Clearance, Survey, Line out etc.

The center line of Fly-over shall have to be got confirmed before execution of Work.

i. Carry out complete initial survey of the River Bridge/ ROB/ Flyover, ramp and various other components using modern electronic surveying equipment. The demarcation of Development has to be obtained from Town Planning Department of PCMC on surveyed drawing and necessary coordination for marking the same on site as directed by the Engineer in charge.

ii. Carry out complete line-out of the River Bridge/ ROB/ Flyover, ramp and various other components using modern electronic surveying equipment including constructing masonry and concrete pillars for providing requisite reference lines and levels,. Constructing control stations, bench marks etc. as directed by the Engineer.

iii. Carry out all, allied works like clearing the road side line, removing and stacking of the existing kerb stones, removing obstructing bushes and trimming trees etc. as directed by the Engineer.

iv. Relocation of underground / over ground utilities / services as directed by the Engineer.

v. Cutting / relocation of trees as directed by Engineer.

vi. Removal / relocation of electrical, telephone poles, cables as directed by Engineer.

2.10 Preliminary Site Preparations

i. Providing site office as per detailed specifications in Volume-III

ii. Providing site laboratory and survey equipments.

iii. Providing casting & stacking yard for pre-cast elements if proposed.

iv. Providing batching plant for preparation of concrete.

v. Mobilizing all necessary plant and equipments.

2.11 PIER PROTECTION / ROAD SIDE KERBS:

Providing pier protection to all piers of flyover component by constructing R.C.C. wall of 20 cm thick (in M-20) around piers to a height of 1.25 m above existing road level / G. L. with a gap of one meter between pier and wall and filling it with murum and 150 mm rubble soling over laid by P.C.C. of M-15 grade of 100 mm thick. The vertical

reinforcement of 16 mm dia at 200 mm center to center and 10 mm dia at 200 mm center to center as distribution steel shall be provided on the outer face and nominal steel on inner face (10 mm dia at 200 mm center both ways) in the RCC wall.

Foundation of wall shall be taken minimum 1.0 m below GL and shall have minimum size 0.45 m x 0.50 m in M-15 over rubble soling of 0.15 m thick.

2.12 MISCELLANEOUS ITEMS AND ROAD APPURTENANCES ETC.

(a) Providing Traffic Safety Devices as per the following brief particulars. For detailed specifications refer Volume- III.

(i) **During Construction Stage - Temporary**:- Providing self standing MS sheet barricading with proper lighting, providing and maintaining safety gadgets like rotaro blinkers, caution boards, cones and cat-eyes etc., including day-to-day maintenance of such traffic diversion system and preparation of traffic planning for the approval of the competent authority such as traffic police, PCMC etc. as specified in the Tender Document or as directed by the Engineer.

(ii) **On the Structure - Permanent**:-Providing traffic lane line strips 100 mm in width with approved thermoplastic road marking paint in two coats over the superstructure as directed by the Engineer. Zebra crossing for pedestrians at appropriate location. Informatory / warning / mandatory sign boards of required shape and size with retro-reflective sheeting of high intensity grade as per requirement including supporting columns gantries / trusses etc as directed by the Engineer and other arrangements as per MoSRT&H specifications. Traffic signpost including sign boards number shall be as per MoSRT&H specifications and traffic department requirement. The gantries and trusses shall be required to span over the deck and be supported only at outer edges of Deck width as directed by Engineer. Total number of such gantries shall be as described. The gantries and trusses shall be as per norms of IRC and will be approved by the Engineer In Charge.

i. Providing suitable arrangements in the bridge superstructure for erecting electric poles, cables etc for lighting the Flyover, ramps and service roads as well as providing suitable cable ducting etc. for lighting and illumination under the obligatory span and slip road and fixing with fixtures - all as per the requirement of PCMC or as directed by the Engineer.

(c) Public Utilities

Details of utilities passing through the corridor have been mapped based on the information collected from the various sources. Any / some of the utilities are likely to cause hindrance to the foundations. These need to be relocated or diverted before taking up the piling / foundation work. These operations need to be done in consultation with the utility provider (owner).

Some of the utilities as could be traced out by the Employer through the Utility providers and Pimpri Chinchwad Municipal Corporation (PCMC) have been listed in the Drawing Volume Contractor is advised use to his own national/international

practices of tracing out or locating these utilities below the ground at no cost to the Employer.

Contractor shall obtain necessary permits/approvals from the respective Utility Provider/Owner well in advance of starting the shifting work. The shifting works shall be carried out through the authorized sub contractor's of the Utility providers without causing any inconvenience to the utility users at large.

Drawings showing the affected services like electric lines, telephone lines, water pipes, sewers, oil pipelines, cables, gas ducts etc. owned by various authorities including Public Undertakings and Local Authorities are indicated on the drawings. The contractor's proposal shall be such that the shifting of utilities is not required. If during the course of execution such utilities are encountered then the contractor shall shift the utilities and will be reimbursed as per the estimate prepared by the concerned department and approved by Employer. The work shall be carried out under the supervision of the concerned department. In case in the opinion of the Engineer it is not possible to divert the utilities, the Contractor shall make necessary modifications in the structure at no extra cost to the Employer.

2.13 CONTRACTOR'S DOCUMENTS

Contractor's documents envisaged under sub clause 5.2 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 survey data, bore logs, levels, proposed instrumentation for ground improvements, monitoring and settlement etc.,

(ii) Design assumptions, calculations (excel sheets, STAAD files etc.,), software used and drawings good for construction,

(iii) Test procedures followed during construction and

(iv) Test after completion along with interpretation and Specialist's Opinion.

(v) Quality Assurance Manual & Maintenance Manual

(vi) Environmental Management Plan (EMP)

Documents shall be submitted to the Employer for review together with a notice as envisaged in the Conditions of Contract.

Employer/ER reserves the right to discuss, correct the design/calculations and propose any modifications 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 payments shall be entertained.

2.14 Documentation:

The Contractor shall furnish the following documents in respect of the following items which shall form part of "Contractor's document referred to at 2.13 above".

The Contractor's quoted prices shall be deemed to be inclusive of all the work involved in preparation and procurement of all permissions as required in the below mentioned activities.

(a) All "as built" drawings and Compact Discs containing soft copies of Drawings shall be supplied by the Contractor free of cost.

(b) 3 sets of site photographs and Video film 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 free of cost.

(c) 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 treatments periodically shall be supplied by the Contractor free of cost.

(d) A "Quality Assurance Manual" covering 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.

(e) 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 finalisation of work.

(f) Arrangement for internal (below the elevated corridor) and external lighting duly approved from competent authority.

(g) Detailed design calculations and working drawings of all the component of the Flyover including launching scheme shall be submitted well in advance of execution, in accordance with the above programme. Three sets of such design calculations and drawings accompanied by complete information and sufficient data shall be submitted to the Engineer after getting the same proof checked & approved by the structural consultant appointed by PCMC and Railways. 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 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.

(h) For the Railway portion the structural design and drawing for main structure, temporary structure drawing, launching scheme along with supporting design and calculation shall have to be proof checked by PCMC approved Consultant and also Proof Consultant approved by Railway and further approval for Railway Engineer.

(i) 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 drawings of initial submission and final approval shall be in AutoCAD and in A-1 size only.

(j) If during the scrutiny of detailed design calculations and drawings for Flyover, including temporary arrangements for launching, any changes therein are found necessary in the opinion of approving Consultant / Railways / PCMC/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 good time to enable the competent authority to approve them in time.

(k) Schedule of reinforcement and the 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.

(l) Eight sets at approved working drawing including one set on reproduction tracing film and 4 sets at approved design calculations shall then supplied by the contractor which will be formally authenticated by the Engineer-In-Charge (4 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.

(m) 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 window 98, office 2000 & AutoCAD 2000 or 2006, shall be supplied by the contractor to the Engineer / PCMC as directed.

(n) 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.

(o) The approved drawings and design calculations of the Flyover & ROB shall be the property of the Employer.

SECTION VI

EMPLOYER'S REQUIREMENTS

CHAPTER – IV
DESIGN CRITERIA FOR STRUCTURES

DATA AND DESIGN CRITERIA FOR STRUCTURES.

I. Design Data for Structures.

i) Main Carriageway for structures and Solid Ramps

1. Carriageway Width : Clear carriageway of 9.00 m & 11.0m for Flyover.

2. Width of Median Verge : Varies. Minimum 0.3 m

3. Crash Barrier : 0.45m.

4. Overall Width of Carriageway : **As described in the scope of work under each Component**.

5. Seismic Effects

i. Seismic Zone : Zone III

ii. Importance Factor (λ) : As Per IRC

6. Speed of Vehicles : 80 KMPH

7. Longitudinal Gradient : As shown in GAD.

8. Exposure Condition : Moderate

9. Temperature range : 0 to $47^{O}C$

10. Underground Water Table : As per Soil Investigation.

11. i) Minimum vertical Clearance to be maintained for traffic :

- 5.50m above roads at obligatory spans
- 5.50m above roads to the soffit of beam of portal frame.
- 6.525m over Railway tracks.
- 1.50 m freeboard over Afflux HFL of River Pawana.

ii) Minimum horizontal Clearance : As per the approved railway drawing for ROB.

12. Max Temp. **= 't'** : $47^{O}C$

13. Live load

For Flyover : As per IRC: 6 (Latest).

The impact factor shall be applied as per IRC-6. In case of continuous structure, impact factor of the shortest span shall be considered.

Note: - The Load of Noise barrier has to be considered while design of structure.

14. Bearing type : POT-PTFE as per IRC-83(Part III)

15. Expansion Joint : Strip seal type/Modular type.

16. Waterproofing of Deck : 3 mm thick polymer waterproofing membrane (as per International Standard Practice).

17. Wearing Course : 50 mm thick BC laid on 12 mm thick Mastic over water proofing membrane.

18. Foundation Type : 1. Pile Foundation with min 1200 dia for ROB portion only and pile dia will be as per latest IRC edition for remaining portion of Viaduct/Flyover from Pawana River to ROB as per latest IRC edition.

2. Open foundation for foundations in river Bed and remaining viaduct/flyover portion from ROB with crossing Pune Mumbai highway with ramps.

19. Founding level of piles and Open Foundations for Tender purposes:**:-**

Founding levels are shown in following table. The depth of foundations given in the table is for tender purpose and to have common platform. Actual levels shall be decided on merit of the strata. The above table mentioning depth of foundation shall form a basis for payments under table for adjustment of contract price.

Sr. No.	Stretch	Founding level (Ref TBM on Compound Wall after Pune Mumbai Road on Dehu Alandi Side with RL = 568.896
1	For Pawana River Bridge A1	550.00
2	For Pawana River Bridge including PP1 , PP2 , PP3 , PP4 , P1	547.00
3	P2, P3 , P4	550.00
4	P5,P6,P7,P8	551.00
5	P9,P10,P11	552.00
6	P12, P13	553.00
7	P14, P15	554.00
8	P16, P17	555.00
9	P18, P19, P20 (ROB Portion)	556.00
10	P21 , P22	558.00

11	P23, P24,P25,P26,P27	559.00
12	P28,P29,P30,P31,P32,P33,P34,P35,P36,P37	559.50
13	P38,P39,P40,P41,P42	560.00
14	P43	561.00
15	P44,P45	562.00
16	P46	563.00
17	For Ascending & Descending Ramps In Empire Estate Area	
18	R21 , R22	558.00
19	R23, R24,R25,R26,R27	559.00
20	R28,R29,R30,R31,R32,R33,R34	559.50
21	For Descending Ramp in front of proposed City Centre	
22	PR31	562.00
23	PR32,PR33,PR34	563.00

20. Velocity of water at H.F.L. : 4.9 m/sec

21. Scour level for river span : Rock level

22. Founding level for river span : 1500 mm below scour level.

23. Safe Bearing Capacity : 100 T / m^2 For Open Foundation

ii) A) For Down ramps from the Flyover to Pune-Mumbai road service road in front of Proposed City Centre.

1.	Carriageway width	:	7.50 m
2.	Overall width	:	8.40m
3.	Footpath width	:	0.0 m
4	Crash Barrier	:	0.45m on both sides.
5.	Seismic effect	:	a) Seismic Zone = Zone III b) Importance Factor (λ)=As per IRC
6.	Design speed of vehicles	:	40 Kmph
7	Longitudinal Gradient	:	As shown in GAD (Vol. IV)
8.	Max. Super elevation	:	4%

9.	Live Load	:	As per IRC: 6 (Latest).

(**Note:** Other details are same as 2.1 above and as per Volume IV of IV).

B) For Up/Down ramps from the Flyover to Pune-Mumbai road service road in Empire Estate Area.

1.	Carriageway width	:	4.15 m
2.	Overall width	:	5.05m
3.	Footpath width	:	0.0 m
4	Crash Barrier	:	0.45m on both sides.
5.	Seismic effect	:	a) Seismic Zone = Zone III b) Importance Factor (λ)= As per IRC
6.	Design speed of vehicles	:	40 Kmph
7	Longitudinal Gradient	:	As shown in GAD (Vol. IV)
8.	Max. Super elevation	:	4%
9.	Live Load	:	As per IRC: 6 (Latest).

(**Note:** Other details are same as 2.1 above and as per Volume IV of IV).

iii) Provision of Ascending/Descending Unit for Pedestrians.

a) RCC staircase of 3.00m clear width with canopy covering.

1.	Eight Units of doglegged staircase having 3.00 m clear width.		
2.	Locations	:	As shown in GAD.
3.	Width of flight	:	as above
4.	Height of Riser	:	150mm (Max.)
5.	Width of Tread	:	300mm (Min.)
6.	Shade/ Canopy	:	Poly carbonate sheeting with MS frame work for covering from all sides of the Staircase arrangement.

II. DESIGN CRITERIA FOR STRUCTURES

1. GENERAL:

The detailed highway and structural design for the work mentioned in the scope of work is to be done by the bidder. The bidder shall quote on his own design for span arrangement proposed in GAD tender drawing. It shall generally satisfy the following requirements: -

(i) It shall ensure soundness of the structure, its durability and architectural beauty as a whole in harmony with the surroundings.

(ii) It shall ensure speedy construction and lead to appreciable economy.

(iii) It shall be accompanied by preliminary but fairly detailed dimensioned drawings and detailed description of work and specification of materials and items. If called upon, bidder shall furnish any additional information necessary for appreciation and comparison with alternative proposals received from other bidders.

(iv) At the time of detailed design the contractor shall not deviate from the basic scheme and employer's requirement.

(v) The superstructure shall have minimum number of expansion joints for better riding surface. It shall involve modern construction techniques which will cause minimum hindrance to the local traffic.

(vi) As far as possible structure shall have uniform aesthetical appearance to enhance the overall look and thereby the vicinity. Aesthetic finishes like grooves, embossed or surface textures (form finished) to be provided for substructure and superstructure as per the detailed drawing approved by the Engineer.

(vii) The entire substructure shall be of uniform type except otherwise necessary.

(viii) For the construction of piers of Flyover, contractor has to design shuttering to suit single pour concreting.

(ix) Minimum length of span for Flyovers shall not be less than 25m except spans as shown in GAD. Other ramps shall have span arrangements as approved by Engineer.

2. RESTRICTIONS ON TYPE OF STRUCTURES:

The following types of structural arrangements shall not be permitted:

(i) Structures sensitive to unequal settlement of foundations, indeterminate structures like continuous, rigid frames, etc. on yielding type of foundations.

(ii) Abutments resting on approach embankments.

(iii) A design in which stability of one or more span is endangered due to failure of some other span or spans.

(iv) Superstructure with joints at the tip of long cantilevers with hinges, gap slab and short suspended spans.

(v) Structures with continuity only in deck slab, in transverse direction. Superstructure more than 4 lanes resting on independent foundations should not be interconnected.

(vi) Piers in the form of multiple columns with isolated / separate footings resting on yielding type strata.

(vii) Superstructures on which the roadway cannot be easily widened in future, such as bowstring girders, through trusses, etc.

(viii) Steel structures or composite construction.

(ix) Girder slab system for superstructure other than ROB portion.

(x) Hollow piers for spans, which are susceptible for impact of vehicles.

(xi) Any type of RCC superstructure.

3. SPECIFICATIONS FOR DESIGN AND CODES TO BE FOLLOWED:

The design of structural components shall conform to the criteria laid down in the latest editions of the following codes of Practice and Standard specifications published upto 3 months prior to last date of issue of tender form and subject to the departures stipulated in these tender documents.

(A) I.R.C. Standard Specifications and Codes of Practice for Road Bridges. :

Section - I	I.R.C. 5	General features of design.
Section -II	I.R.C. 6	Loads and stresses.
Section -III	I.R.C.21	Cement concrete plain and Reinforced (Second Revision).
Section - V	I.R.C.24	Steel road bridges for permissible stress only. (Other provisions as per AASHTO Code)
Section -VI	I.R.C.22	Composite construction for road bridges (for permissible stresses only) (Other provisions as per B.S.5400 part 3, 5, 6).
Section -VII	I.R.C.78	Foundation and substructure.
Section -IX	I.R.C.83	(Part-I) Metallic Bearings.

Section -IX	I.R.C.83	(Part-III) POT, POT CUM PTFE PIN AND METALLIC GUIDE BEARINGS.
	I.R.C: 18	Design criteria for pre-stressed concrete Road Bridges (Post tensioned concrete).
	I.R.C: SP 64	Guidelines for design of voided slabs
	I.R.C: SP 65	Guidelines for design of segmental bridges.
	I.R.C: SP 66	Guidelines for design of continuous bridges.
	I.R.C: SP 70	Guidelines for the use of High Performance Concrete bridges.
	I.R.C: SP 71	Guidelines for design and construction of pre-cast pre-tensioned girders for bridges.
	IS 2911	Code of practice for design and construction of pile foundations.
	IS 13920	Ductile detailing of reinforced concrete structures subjected to seismic forces - Code of practice.
	IS 1893 (Part I)	Criteria for earthquake resistant Design of structures.

MORT&H specifications for Road and Bridge Work-2001.

Provision of seismic details as per India Highway Publication.

For structure within Railway area provision as per following Indian Railway Standard Code shall be made.

a) Code of Practice for Plain, Reinforced and Pre-stressed Concrete for general Bridge Construction (Concrete Bridge Code) Second Revision – 1997.

b) Code of Practice for the design of sub-structures and foundations for Bridges (Bridge sub-structures foundation code).

c) Specification for RCC/ PSC for the construction, Rehabilitation of Concrete Bridges and structures on Central Railway (open line) issued on 1/12/2000.

(B) Any I.R.C. standard specifications and codes of practice or criteria for road bridges other than "A" above, but published 3 months prior to last date of issue of tender form.

(C) For any item not covered by A & B above, specification for Road and Bridge works published by I.R.C. for Ministry of Road Transport and Highways, Government of India.

(D) For items not covered by any of the A, B & C above relevant provisions of IS codes of practice.

(E) For any item not covered by A, B, C & D above, the relevant provisions from B.S. Codes of Practice.

(F) For items not covered by any of the above Standards and Specifications, sound Engineering practice and provisions in the Departmental design and provisions of relevant Codes of other nation shall be referred. In this regard decision of the Engineer's Representative shall be final and binding.

4. OBLIGATORY PROVISIONS

4.1 Alignment and location

Alignment and location of the Flyover/Viaduct Structure and ROB shall be as shown in the Departmental drawings. The Co-ordinates and levels shall be approved by The Engineer.

4.2 The Length of main Flyover Structure and ROB:-

The length of the Flyover shall satisfy the following criteria.

(a) The centre line of the various structures as shown on the GADs should not be changed, except under unavoidable circumstances with approval from the Employer.

(b) Maximum height of embankment at abutment location shall not be more than height shown in GAD and clear height below the soffit shall not be less than 1.5m.

(c) Longitudinal gradient shall not be steeper than those shown in departmental drawings. The Vertical and Horizontal curves should be smooth with radius not less than shown in GAD.

(d) Restrictions on terminal points if specially mentioned in departmental drawings.

(e) Any other criteria shown on the departmental drawings / supplementary data.

(f) Overall length of River Bridge/ Flyover/ ROB proper and structural viaduct shall not be less than the length shown in departmental drawings.

(g) In case of Flyover, the horizontal and vertical clearances and pier locations shown for the obligatory spans shall be as per departmental drawings.

(h) Locations of obligatory spans shall be as shown in the Departmental Drawings. They may be changed slightly during execution as per site requirements with approval from the Employer.

(i) In case of ROB, the minimum Vertical and Horizontal Clearances under the Railway Bridge Portion shall not be less than those shown in departmental drawing i.e. approved GAD from Railways.

(k) It is obligatory to locate pier No P42, P43 (Over NH-4 Road) of individual Carriageway, **in** the Landscape Portion only and the width of the pier shall not exceed 2m.

(l) It is obligatory to locate pier No P3, P4 (Over 18.00 D.P.Road) of individual Carriageway, as shown in the GAD.

(m) It is obligatory to locate pier No P10, P11 (Over Existing Pimpri-Chinchwad Link Road) of individual Carriageway, as shown in the GAD.

(n) It is obligatory to locate pier No P41, P44 (Over Existing Pune-Mumbai Road) of individual Carriageway, as shown in the GAD.

(o) Size and shape of pier shall be kept uniform for all piers of same carriageway width.

(P) It is obligatory to construct Portal Frames Substructure for pier No P5, P6, P7, P8, P9 & P14, P15, P16 on Left side of Flyover/Viaduct as shown in the GAD.

4.3 Road Level on the Flyover and Roadway Particulars:

(a) Roadway particulars and carriageway widths shall be as per relevant Departmental drawing.

(b) The vertical geometry of the finished surface of deck slab and wearing course 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. Super-elevation, camber & widening on curves shall be suitably considered. The design of curves shall be such that rate of change of vertical curvature ('K' value) shall not be less than those shown in tender drawing. The design speed on curve shall be as stipulated in Design Data.

4.4 The span arrangement for complete project, horizontal and vertical geometry shall remain unchanged. Under unavoidable circumstances minor modifications can be permitted after approval by the Engineer in-charge.

5. BORING DATA AND SOIL AT SITE.

5.1 The Soil Investigation report is attached herewith in **Volume III** of the Tender Document as **"Annexure A to Volume III"**.

5.2 The contractor shall have to take borings by double tube boring machine for each carriageway at the final location of each pier and abutment prior to the commencement of the work to ascertain the rock levels/quality at the location of the foundations and this shall form part of the contract and no payments will be made by the Department for boring, soil sampling and testing etc.

(a) During execution of the work, the samples from the bore taken at each foundation shall be tested for relevant tests and analyzed in the laboratory approved by the department for establishing design parameters. Tests such as standard penetration test, compression and shear test on undisturbed soil samples, etc., shall be carried out in conformity with the specifications. The Contractor shall submit the entire data to the Engineer along with his own/laboratory recommendations and obtain approval to the design-parameters. Necessary interpretation of the result of tests shall be furnished to the Engineer for scrutiny of design of foundations.

(b) The cost of these test and interpretation of the test results shall be included in the tendered amount. No payment will be made separately for the testing of soil or rock.

(c) The S.B.C. at the foundation level shall be verified during construction so as to ensure that the stresses imposed on the foundation strata are within permissible limit. The taking out of samples and carrying out required tests shall be in conformity with the departmental specifications. The Contractor shall then submit the entire data to the Department along with his own/laboratory recommendation and obtain approval to the design parameters.

6. FOUNDATIONS:

6.1 Piers/Abutments:

6.1.1 For bidding and for the purpose of tender, general foundation levels proposed for the piers & abutments shall not be higher than those proposed in the Employers design. Where pier positions differ from the departmental design, the levels shall be interpolated for the purpose of this clause.

The Founding Levels to be considered as a benchmark in deciding the +/- variations (Pursuant to the Schedule of Variations of Volume-I) shall be as per 19 of Data and Design criteria for structures.

6.1.2 Detailed design shall be carried out only with pile/open foundation for abutments and piers as shown in GAD.

6.1.3 The maximum base pressure under worst combination of loads & stresses condition for open foundation shall not exceed 100 T/m^2. The allowable stresses shall be as per codal provisions.

6.1.4 Buoyancy to be considered shall be 100% for open as well as pile foundation.

6.1.5 Abutment structure shall be fully retaining Reinforced Concrete structure. No passive pressure shall be considered for the design of abutment.

6.1.6 Checking the stresses at the base of foundations shall be as per IRC provisions and it shall be ensured that under the worst combination of forces there is no tension in case of foundation resting on soil.

6.2 Ramp / Retaining walls

6.2.1 The solid ramp portion of the Flyover shall be a Reinforced Soil retaining structure with decorative facia. Open foundation for retaining structure is acceptable. The foundation shall be taken minimum 1.5m below road level with SBC of 20 T/m^2.

6.2.2 For foundation of Retaining structure if design requires increasing SBC at foundation level by any soil stabilization method, the cost of this stabilization shall be borne by the Contractor.

6.2.3 Kerb stones shall be provided parallel to the retaining wall to protect it from damages and to channelize the traffic running on side roads. The gap between the kerb & Retaining wall shall be filled up with sand and covered with interlocking blocks at least 500 mm on either side.

6.2.4 Reinforced Soil Retaining Wall (RE Wall) for Pawana river Bridge, Facia Panel shall be 600 mm H.F.L behind the abutment and it shall be based on concrete wall M300 with minimum thickness 750 mm.

6.3 Pile foundations

6.3.1 The pile foundation shall be designed considering various load combination forces and permissible stresses as per the latest edition of I.R.C.78. The piling shall be done by hydraulically operated rotary drilling machine only.

a. 8 mm thick M.S. liner with end stiffeners of 300 mm height and of equal thickness at the bottom shall be provided to the piles from the bottom of pile cap up to rock level with anticorrosive treatment specified under Clause 2.22 for the piles in the ROB portion at pier locations P18, P19, & P20 of each individual carriageway (Refer Dwg. GAD for Railway span of

vol IV). For piles at other location, temporary liner may be provided wherever it is necessary.

b. Shift and tilt of pile shall be considered as per IRC: 78 – 2000.

6.3.2 The following criteria shall be considered for deciding the length of embedment.

1. **The minimum embedment of piles in hard rock shall not be less than 1.25 times diameter of pile. The pile capacity in rock shall be calculated as per IRC: 78 (latest edition).**
2. Safe Bearing Capacity of rock shall be worked out on the basis of RMR value. In no case the capacity of pile shall exceed 500 Tons per sqm under normal condition with the embedment mentioned above. Minimum embedment is required to be provided despite this limitation on pile capacity..
3. The piles shall be designed as fixed end bearing. Fixity shall be considered at the top of rock where the socketing begins and at the center of pile cap. Side friction from G.L. up to embedment level shall not be considered for design. Support from surrounding strata shall not be considered for design of piles.

6.3.3 The pile capacity shall be confirmed by pile load test as per IS-2911 (Part IV).

1. The vertical and horizontal design capacity assumed for the piles shall be verified by the initial load testing of 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. Initial test shall be carried out on one pile per dia. for viaduct portion and one pile for ROB portion. Additional one pile per dia., which is actually going to be used for piers and abutments, shall be tested for 1.5 times the design load. These tests and the routine tests shall be as per I.R.C. 78 (Latest edition) & MORTH Specifications. 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.
2. The lateral Load carrying capacity of pile shall be assessed by carrying out lateral load test on a single pile for a deflection as per IRC Codal provision at top.
3. Side friction (Skin Friction) from G.L. up to embedment level shall not be considered during design.
4. The piles shall be designed as end bearing considering fixity as mentioned above. There shall be no tension at the base of pile under any load combination.
5. The minimum dia. of piles shall be 1200mm for ROB Portion Only.
6. Annular piles filled or unfilled shall not be accepted.
7. Design with single row of piles shall not be accepted.

8. Use of High performance concrete for piles is not permitted (M60 and above).
9. NDT Tests at regular intervals as directed by the Engineer for at least 10% of total number of piles shall have to be carried out by the contractor with no cost to the employer.
10. The cost of all above tests shall be borne by the contractor and no extra payment will be made to the contractor.
11. Only bored cast in situ piles shall be accepted.
12. For piles within ROB, Railway area, minimum dia. of pile, MS liner to pile, provision of anticorrosive treatment to reinforcement, method of construction of pile etc. shall be as per IRS/IRC Code and as per drawing approved by Railway authorities.

7. SUBSTRUCTURE

For continuous spans pier, with fixed bearing shall be designed to take all the horizontal forces.

7.1 Minimum *Dimension* of any element of substructure except pedestals shall not be less than 300 mm.

7.2 Dead man anchors or friction slabs shall not be accepted behind abutment for relieving moments.

7.3 Scope for accessibility for inspection and arrangement for lifting of the superstructure for future replacement of bearings shall be provided for in the design of substructure. The positions of jacks shall be distinctly marked on the drawing and on pier / pier cap.

7.4 The height of pedestals plus bearing shall be min. 150 and maximum 500 mm.

7.5 Slender piers shall be checked for deflection under horizontal and eccentric forces and secondary forces if any. Pier, bearings and expansion joints shall be suitably designed.

7.6 One span dislodged condition shall be considered as erection condition (load combination VI, VII of IRC-6) for the purpose of design.

7.7 Earth retaining structure shall be designed for the earth pressure calculated as per any theory permitted by the IRC Codes.

7.8 Special aesthetic finishes like grooves etc. shall be given to the structures to the satisfaction of the Engineer. Aesthetic finishes shall not form the part of structural requirement of any member.

7.9 All the piers in the central verge (median) shall be designed for a vehicle collision load as per IRC provisions.

8. SUPERSTRUCTURE

General:

(a) Only PSC Box / PSC voided slab -type superstructure is allowed in all locations except in ROB portion if railway authority does not allow for box Type Superstructure. Alternatively pre-cast 'I' girder section/ Steel Girder may be provided for obligatory span of ROB if insisted by railways as per their requirements.

Stage construction of deck slab is not allowed. Deck slab shall be designed for 40t bogie load (class 70R load) and wheeled vehicle of Class AA vehicle in addition to loading mentioned in Design Data. Minimum thickness of deck slab, soffit slab, webs shall be as per sketch given in Annexure-1 and satisfy all the provisions of IRC-18 2000.

(b) In case of voided slab minimum thickness of concrete cover to the void shall be 200 mm above the void and 250 mm below the void. The arrangement for draining out water from voids shall be made. Solid slabs are not allowed.

(c) Superstructures designed for continuity only under live loads shall be permitted.

(d) Superstructure shall be designed for 10 mm differential lifting at bearing location. This shall be considered as an erection condition.

(e) It shall be obligatory to carry out design based on longitudinal and transverse analysis

(f) The superstructure shall have minimum expansion joints to enhance riding quality.

(g) Special aesthetic finishes like grooves etc. shall be given to the sides and soffit of superstructure to the satisfaction of the Engineer. Aesthetic finishes shall not form the part of structural requirement.

9. DESIGN LOADS:

9.1 Live Loads:

9.1.1 The bridge shall be designed to carry combination of I.R.C loadings, as per clause 207.4 (IRC: 6-2000) whichever produces worst effect.

While checking for one span off condition, live load of IRC Class-A one lane per two lanes without impact shall be taken into account and this shall not be considered in conjunction with seismic / wind force. Braking force shall not be considered.

9.1.2 The design shall cater for renewal / overlaying of wearing coat load of 110 Kg/m^2.

9.1.3 Loads from services facilities viz. electrical cable, telephone cable at 100 Kg/m or actual loads whichever is higher on either side of carriageway.

9.1.4 Loads from other utilities and pedestrian loading shall be as per "Design Data".

9.1.5 For Railway Portion - As per IRC:6 - 2000 or as approved by Railway Authority whichever produces worst effect.

9.2 Construction Loads

The structure shall be designed for the load coming from the launching girder, beam and winch system, segment delivery trailer etc. Impact of such loads shall be considered not less than 10% total load.

9.3 Wind Forces:-

9.3.1 Wind forces shall be considered in the following two ways. The design shall be governed by the one producing the worst effect.

(i) Full wind force at right angles to the superstructure.

(ii) 65 % of wind force as calculated in (i) above acting perpendicular to the superstructure and 35 % acting in traffic direction.

9.4 Temperature-Range:-

(i) For design of structure to account for temperature in formula dL = alpha x L x t, the value of "t" shall be 47 degrees centigrade i.e., ± 25 for extreme atmospheric exposure condition.

Note: - The temperatures variation shall be accounted for in design of structures as per design data.

Alpha is the Coefficient of Expansion or Contraction and L is the length of the member and dL is the expansion or contraction due to a variation of temperature in appropriate units.

(ii) The superstructure shall also be designed for effects of distribution of temperature across the deck depth as per IRC: 6-2000. For calculation of thermal forces effect of 'E' value of concrete should be taken as 50% of the instantaneous value so as to account for effects of creep on thermal strains.

9.5 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 - 1.8 T/Cum.

ii) Saturated Density - 2.0 T/Cum.

iii) Ø = 30 Degree, $\delta = 20^{O}$

iv) C = 0

9.6 Seismic Forces:-

For the calculation of fundamental period, as per appendix 2 (amendment No. 6) of IRC: 6 -2000, the length shall be considered from top of the pier cap to top of pilecap/footing.

The seismic coefficient so calculated shall be applied for foundation and substructure design.

10. PERMISSIBLE STRESSES:-

10.1 Allowable stresses for plain and reinforced concrete shall be as per IRC-21 and for pre-stressed concrete (post tensioned) as per IRC-18.

10.2 The permissible shear stresses shall be as given in IRC-21 & IRC-18.

11. DURABILITY

11.1 Grade of Concrete

11.1.1 Minimum grade of concrete for Foundation shall be M30.

11.1.2 Minimum grade of concrete for substructure shall be M30.

11.1.3 Minimum grade of concrete for superstructure shall be M45.

11.1.4 Minimum grade of concrete for pile foundation shall be M35.

11.2 Minimum Cement Content

11.2.1 For both plain and reinforced concrete, the value given below regarding minimum cement content and maximum water-cement ratio shall be as per Clause 302.6 Table No. 5(A) of IRC: 21-2000

11.2.2 High strength ordinary Portland cement conforming to I.S.12269 will also be permitted.

11.3 The minimum nominal dia. of reinforcement and clear cover shall be as follows

(Only Fe-500 CRS steel shall be used).

11.3.1 The minimum nominal dia. of reinforcement shall be 10 mm.

11.3.2 Minimum clear cover to reinforcement for all grades of concrete shall be as per Clause 304.3 IRC: 21-2000.

11.3.3 The cover shall be measured from the inner face of the groove for substructure and superstructure.

11.4 The H.T.S. strands to be used for P.S.C. structures shall be Stress Relieved Low Relaxation Steel conforming to Class-II of latest IS: 14268.

11.5 Anticorrosive protective paints to foundation, substructure and superstructure shall be as per Clause No. 20.

12. PSC BOX GIRDERS

12.1 For proportioning of the box girder, the sketch given in Annexure-1 of this volume shall be adopted. Overhangs shall not be more than those shown in the drawing in Annexure-1.

The entire box shall be a single unit without any construction joint in longitudinal direction.

12.2 Minimum thickness of intermediate diaphragm provided shall be 300 mm and that of end diaphragm shall be 500 mm.

12.3 Two manholes shall be kept in soffit of every span with arrangement for access inside the box.

12.4 The following method of analyzing and designing box girder is acceptable.

(i) Calculate the main girder moments, shear forces and torsional moments as for a single beam.

(ii) Also add to above, the forces due to the restraint of warping torsion at the ends.

(iii) In addition, calculate the bending moments in the roadway slab considering the slab, the web and soffit slab as a closed frame.

(iv) Reinforcement in the slabs and webs due to the transverse moments must be provided in addition to the steel, which is required for shear or torsion in the box as a main girder.

(v) Distortion of box girder due to transverse moment should be considered in the design.

(vi) In the absence of rigorous analysis (a) for the torsional moment (b) for forces due to restraints of warping torsion at ends the design live load moments and shear force in the longitudinal direction shall be increased by 20% and transverse reinforcement steel be increased by 5%.

(vii) While designing the various components like bearings, pedestals etc., the maximum and minimum reaction as per detailed transverse analysis shall be considered.

13. PRESTRESSED CONCRETE

(a) Permissible stress in concrete during service shall be as per Clause 7.2 of IRC: 18-2000.

(b) All pre-stressed members shall have spare cables laid to the profiles approved by the Department. The number of spare cables shall be 5% of the

cables 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 holes shall be grouted. In case of saline atmosphere these cable holes shall not be grouted but only ends shall be closed properly.

(c) The provision for imparting 20% of design pre-stress at a future date shall be made in the deck and suitable anchorages; bulkheads diaphragms etc. shall be constructed for the purpose. Arrangement for external pre-stressing shall be got approved from the Engineer.

(d) Sheathing for post - tensioned superstructure shall be corrugated HDPE type as per IRC: 18-2000.

(e) The ends of pre-stressing anchorages in case of post-tensioning shall be protected against corrosion.

14. PRECAST SEGMENTAL CONSTRUCTION

14.1 Pre-cast segmental construction if adopted shall be designed as per Clause 7.2.3 of IRC:18-2000 and IRC:SP-65 and Guide specifications for design and construction of concrete segmental bridges (latest).

14.2 Requirements regarding minimum dimensions shall be as per Annexure I of this volume. External pre-stressing within the box with necessary protection against corrosion shall be allowed.

14.3 For construction with continuous spans the portion over piers, the key segments and end segments at expansion joints may be cast in situ; all other segments shall be pre-cast. For simply supported spans all the segments shall preferably be pre-cast.

14.4 All the segments shall be match-cast. During match-casting necessary care shall be taken to minimize the effect due to temperature arising from hydration of concrete of adjacent segment.

14.5 The shear keys at the face of segments shall be as under:

(a) On each web single key or multiple keys shall be provided. These keys shall be designed to transmit shear forces.

(b) On the top and bottom slabs keys shall be provided to maintain alignment and level.

14.6 Formwork shall be robust and the foundations of the casting and stacking yard shall be designed to safely support all applied loads without undesirable deformations or settlements.

14.7 In order to achieve smooth profile of pre-stressing cables and to prevent entry of cement slurry at the joints of matching segments; pipe shall be inserted through the cable duct of both the segments (i.e. matching segment and segment being cast) at the time of concreting.

14.8 Bond breaking agents shall be used while casting the segments so that the segments can be easily separated after casting.

14.9 The joints between adjacent segments shall be treated with appropriate epoxy formulation to facilitate erection and to fill cavities if any. While applying epoxy, care shall be taken to see that the epoxy does not block the openings of the cable ducts.

Epoxy shall be applied on the interfaces of both the segments and the segments shall be subjected to a pressure of minimum 2 Kg/cm^2. This may be achieved either by using temporary pre-stress or by any other method. Permanent cables shall be introduced in the duct and after pre-stressing the required number of cables the temporary pressure can be released.

14.10 The method of erection of segments shall be such that the desired geometric profile of the bridge deck is obtained. During erection stage temporary blockade of one lane of traffic may be allowed with the permission of Employer.

14.11 The segments shall be checked for stresses during handling and erection.

14.12 Reference may be made to document "Guide to good practice: Recommendations for segmental construction in pre-stressed concrete" published by F.I.P.

14.13 The launching/erection of all the pre-cast segmental superstructure segments shall be carried out by over slung method using launching girders. The decision to adopt under slung method for launching/erection shall be as per the discretion of the Engineer.

15. BEARINGS BELOW SUPERSTRUCTURE:

(a) POT-PTFE Bearing from MORT&H approved manufacturers in cast steel shall only be permitted.

(b) The bearings shall be easily accessible for inspection.

(c) Scope for lifting the superstructure for future replacement of bearings shall be provided for in the design of bearing. The scheme of lifting shall be indicated on the drawing to be submitted at the time of tendering.

(d) The contact surface of superstructure shall project beyond the edge of the bearing plate by a minimum distance of 100 mm at any location.

16. EXPANSION JOINTS:

16.1 Only strip seal joints (for horizontal movement up to 80 mm), modular strip joints (for horizontal movement beyond 80 mm) shall be permitted, conforming to modified interim specifications for expansion joints.

16.2 The expansion joints should generally be spaced at not less than 75 m. except in case of unavoidable circumstances.

16.3 Uniform type of expansion joint shall be provided for the entire deck.

16.4 All the expansion joints shall be water tight.

16.5 Expansion joints shall conform to MORT&H specifications and procured from MORT&H approved manufacturers.

17. RAILINGS, PARAPET, CRASH BARRIERS AND MEDIAN VERGE:

17.1 Anti crash barriers having a typical cross section as shown in Annexure-2 shall be provided.

17.2 Providing R.C.C. median, sand filling inside median, DWC pipes 4 Nos., interlocking blocks, bitumen pad in expansion gap etc.

18. WATER SPOUTS

Water spouts as per MORT&H Type design No.SD/303 shall be provided. However, the diameter of pipe shall be 150 mm.

Waterspout shall be 150 mm ϕ G.I. and connected to runner pipe (HDPE type) of suitable diameter (Minimum 150 mm) and taken down by down take HDPE pipes of suitable diameter at approved locations. Arrangement for clean out plug shall be made.

Collection chamber shall be made and shall be connected to nearest existing S.W. drain through 300mm dia. NP4 pipe or as per direction of Engineer In Charge.

19. WEARING COAT:

A wearing course of 12 mm mastic will be laid on 50 mm Bituminous Concrete laid on over 3 mm thick waterproofing membrane shall be provided over the concrete deck. However on approaches a flexible wearing course as shown in the departmental drawing shall be provided.

20. ANTICORROSIVE PAINT:

Anti-corrosive protective paint as mentioned below and approved by the Engineer shall be provided. This paint shall be got tested from the approved laboratory and shall be of approved quality, colour and shade.

The protective coating shall be applied to:

(a) Superstructure and Part of substructure exposed to atmosphere - Anti carbonation acrylic paint of synthetic enamel in two coats each of minimum 70 micron shall be provided.

(b) Part of foundation / substructure in contact with earth up to GL or in contact with water - one coat of primer and two coats of coal tar epoxy. Total DFT 210.

(d) The superstructure shall be treated with following protective coatings.

(i) **Parapets/ Railings / Crash Barriers**

Waterproof cement based paint of approved quality and colour in three coats.

(ii) **Deck/Girder/box and inner surface of the Superstructure**

Waterproof cement based paint in three coats of approved quality and colour.

21. ELECTRICAL WORK / STREET LIGHTING:

The scope of work covers providing and fixing following items as per details given in tender

1. Junction boxes, pullout boxes.
2. Sleeves, base plate and anchor bolt for fixing electrical poles.
3. Provide 110 mm ϕ Double Wall Corrugated (DWC) pipe of PE with IS 14930 Part-II mark, one in each crash barrier for entire length of Flyover and up to nearest junction box.
4. Providing 110 mm ϕ Double Wall Corrugated (DWC) pipe of PE with IS 14930 Part-II mark 4 Nos. in median for entire length of Flyover 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 lights of appropriate lux as per IRC Standards through out the length on Flyover and road below the Flyover.
7. Lighting below the Flyover shall be carried out with appropriate fittings and illumination not less than 80 lux.

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 Standard Institution and with the directions and to the satisfaction of the Engineer. For more details refer SP- 7 of vol III of tender document.

22. MISCELLANEOUS:

i. Pillars with granite tablets:

Provision of suitable pillars, one at each corner of the bridge, of suitable architectural design to define the ends of the Flyover with suitable pedestals to house granite tablets as per details to be got approved by the Engineer.

ii. Lane markings:

Provision of necessary lane markings with thermoplastic paint, reflecting lane studs etc., on the Flyovers, ramps and service roads

iv. Design and construction of staircases as shown in Departmental Drawing.

v. Providing RCC Road Kerb, Median, Sand filling in median, service ducts, interlocking blocks over median, wearing coat, bearing, expansion joint and protective coat for Flyover as per tender.

vi. Resurfacing:

The road surface below Flyover and service road shall be cleaned properly and resurfaced to bring to original condition before completion of work.

vii. Overhead Gantry / Sign Boards / Signals:

Providing and fixing in position overhead Gantry frame, trustles sign boards/signals as per approved drawings and specifications.

viii. Architectural treatment:

Providing architectural treatment/ features as per approved drawings and as suggested by the Engineer In Charge during the course of execution.

ix) Traffic diversion:

Providing and maintaining necessary traffic diversion, barricading of site during construction such that 7.5 m clear carriage way is available on both sides at any given point of time. Details of barricading shall be as per annexure III. The complete area of work shall be cordoned off with necessary barricading as mentioned herein. There should not be any hindrance to the traffic. Centering scheme shall be designed on the same basis as that of barricading.

23. ENVIRONMENT & DURABILITY:

Some of the most important issues in this connection are as under:

i. High tensile steel shall be stored as per stipulated in I.S. codes and duly protected during storage. It shall be procured properly sealed and protected from rusting using all possible measures.

ii. Restricting the water cement ratio of concrete and increasing the workability by the use of carefully selected plasticizers / additives approved by the Engineer.

iii. Employment of large pre-stressing unit whose strands can be threaded after concreting and use of multi-strand pre-stressing jacks which can stress all the strands of a cable at the same time.

iv. Special efforts with very close supervision shall be made to control the grouting operation by keeping water cement ratio as close as 0.35 as possible (though IRC 18 provides for W/C ratio as 0.45). The admixture shall be selected by the proper care and as approved by the Engineer.

NOTE: 1) All other works as detailed in Design Criteria and tender drawings and as are essential for the entire completion of the works and as directed by the Engineer.

2) Providing all Specifications of the normal items of the Flyover shall be as per Ministry of Surface Transport, the Standard Specifications of PWD subject to the other special provisions described herein. If the Contractor provides the use of any special type of materials not covered by the standard specifications of PWD/ Specifications of the Ministry of Transport, the contractor shall furnish the specification along with his standard and these shall be got approved from the department.

24. SPECIAL PROVISIONS:-

Following provisions shall supersede those provided in relevant clause of IRC / IS Codes.

i. All the structural elements of this project shall be designed as per IRC - Working Stress Method.

ii. For design purpose unit weight of reinforced cement concrete shall be considered as 2.5 T/m^3 and that for pre-stressed concrete as 2.6 T/m^3.

iii. The distribution reinforcement in deck slab shall be provided as per 0.3 x (LL moment + DL moment).

iv. The piers/columns under service condition shall be checked considering effective length as 1.5xL ('L' measured from top of pier cap to top of pilecap/footing.

v. Minimum eccentricity of 75mm in each direction due to likely shifting shall be considered in the design of piles.

vi. Irrespective of the % of voids provided in the voided slab, reinforcement detailing in the voided slabs shall be as per IRC:SP 64 (Guidelines for design of voided slabs).

vii. In a curved Box Girder, minimum two nos. of intermediate diaphragms shall be provided.

viii. Pier including pier-cap shall be cast in single pour and without any construction joint.

25. LOAD TEST:

25.1 In case a structure or a component of structures proposed by the contractor, in the opinion of the Engineer is of unusual nature, then the Engineer shall have the right to call upon the contractor to carryout model testing and/or load

testing of the structure or component to prove its suitability. The cost of such test shall be borne by the contractor.

25.2 **T**he Contractor shall have to carryout a load test on one unit of the structure across railway line and one unit of structure other than railway span, for the design static loads or their equivalent and in a manner as may be decided by the Engineer.

25.3 In the event of load testing being ordered the contractor shall:

(i) Prepare well in time all necessary calculations and details of arrangements for such load testing, e.g. the magnitude of the test load, mode and method of carrying out the test, the application of loads, duration of keeping the load, the equipments to be provided and observations to be made during and after placing the loads in position etc.

(ii) Make all necessary arrangements for observations, centering, equipments etc., that may be needed for measuring the settlement, deflections etc., required for the test, to the entire satisfaction of the Engineer and

(iii) Provide labour and make all observations during the test

25.4 After the test, the contractor shall submit a report on the results of the tests. The Engineer shall then communicate as to whether the test has been satisfactory or not. Any further tests or reconstruction or strengthening as may be necessary shall be decided.

25.5 When the tests are declared by the Engineer as having been completed, the contractor shall remove all loading which might still be on the bridge as well as in the surroundings.

25.6 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.

25.7 The test shall be carried out in the presence of Engineer.

25.8 Acceptance Criteria for Load Test:

25.8.1 The criterion of acceptance is based on recovery of deflection after removal of test load. The following table gives the criteria for R.C.C. and P.S.C. superstructures.

Sr. No.	Type of Bridge	Load Intensity for Testing	Duration of retention of test loads (hours)	Maximum deflection	Min. % recovery of deflection after 24 hours
1	Reinforced concrete	1.0 D +	24	$40l^2 \times 10^6/d$	75

		1.1 L			
2	Pre-stressed concrete	1.0 D + 1.15 L	24	$40l^2 \times 10^6/d$	80

Where l - Length of span (mm) D - Dead load.

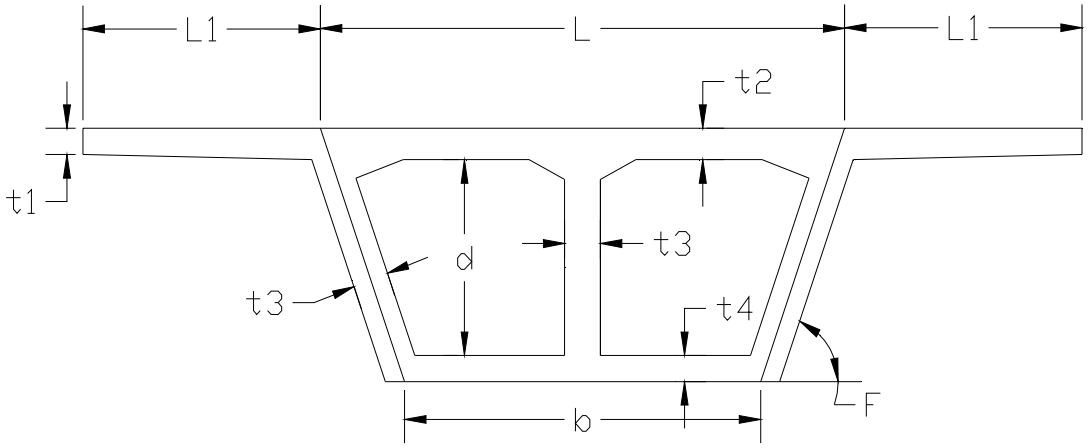
d - Depth of main beam (mm)L - Live load without impact

It should be ensured that moment generated by the test load is equal to design live load moment.

25.8.2 The test load on bridge shall be applied in not less than 4 approximately equal increments so that no untoward distress occurs in the structure. Assuming that the maximum of 100% of the design live load is to be applied, the 1st stage of loading (including the dead load of stacking platform) could be 60% which can be increased in steps of 70%, 80%, 90%, 100% done in the same stages. It shall be ensured that the total duration of loading and unloading operations is same.

ANNEXURE-1

DIMENSION OF BOX GIRDER



MINIMUM DIMENSIONS

t1	200 mm
t2	240 mm
t3	300 mm
t4	200 mm
b	3000 mm
d	1500 mm

LIMITATION OF OTHER PARAMETER

L1 SHALL NOT BE MORE THAN LEAST OF 0.45L AND 3 m.

F NOT LESS THAN 70^0

OPENING IN DIAPHRAGM NOT MORE THAN 50% OF AREA AND NOT LESS THAN 900 x 900 mm.

Note : REFERENCE MAY BE MADE TO SCHEEF AND SCHAICH'S BOOK FOR DETAILING.

ANNEXURE-2

DETAILS OF ANTI CRASH BARRIER

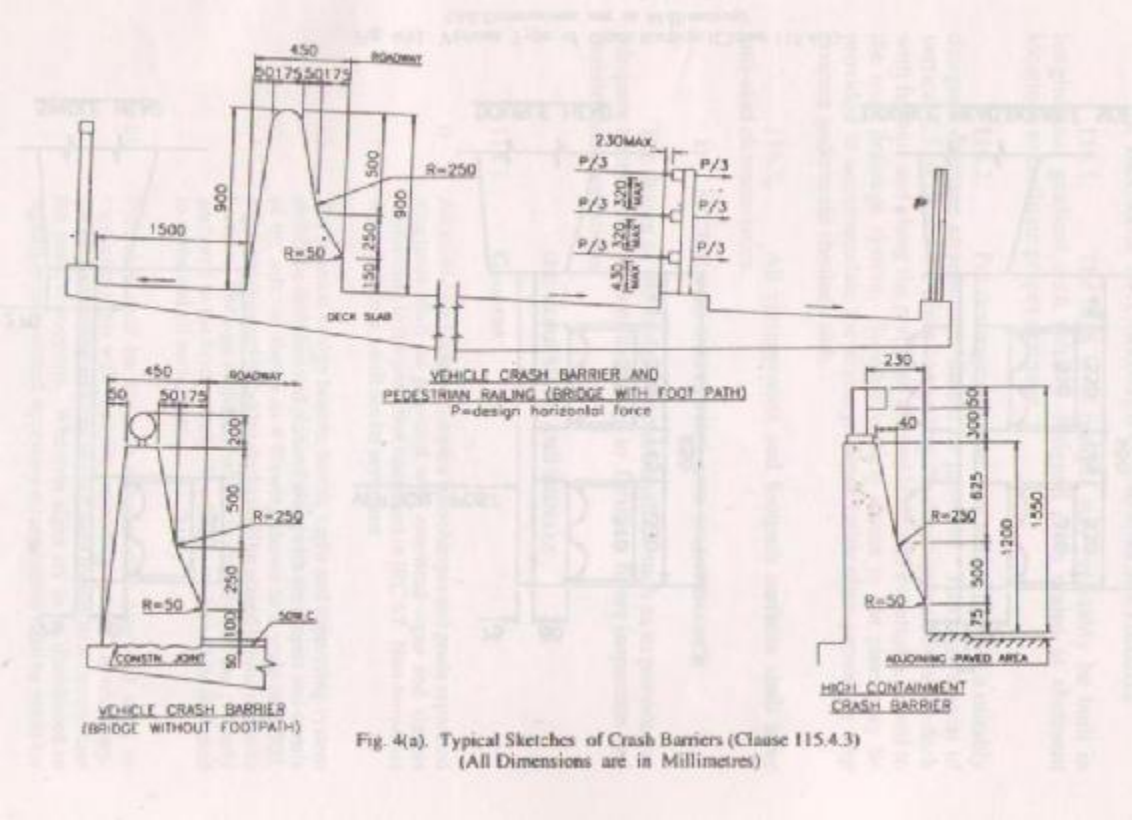
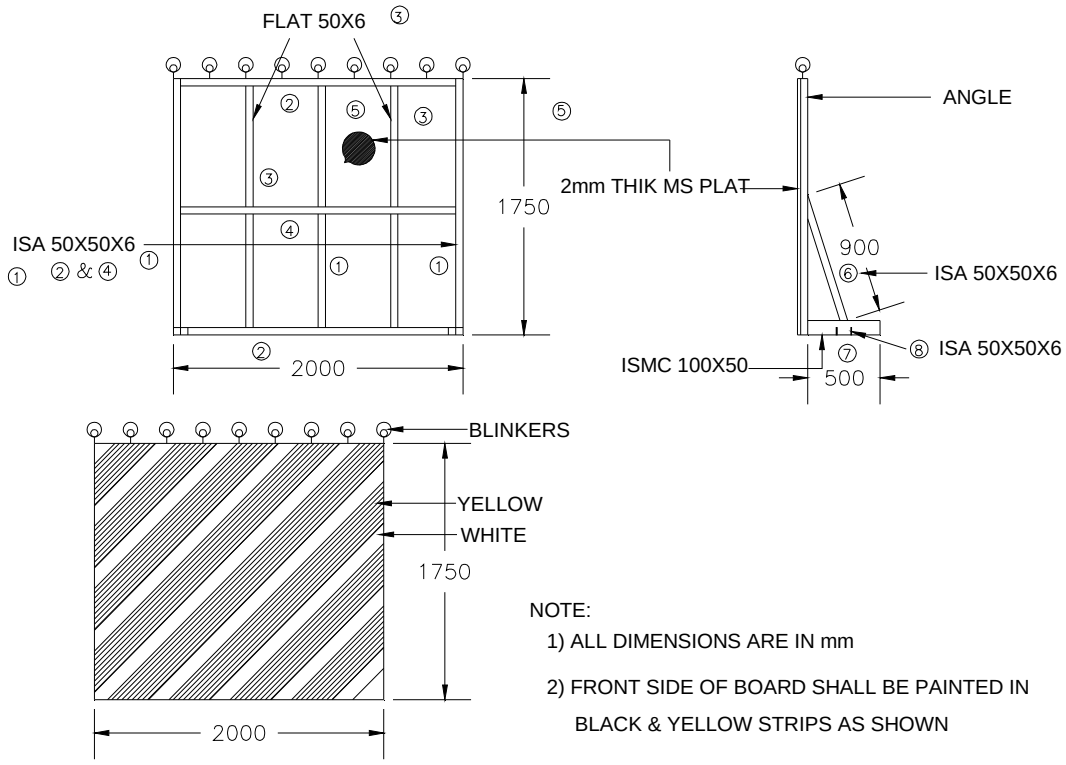


Fig. 4(a). Typical Sketches of Crash Barriers (Clause 115.4.3)
(All Dimensions are in Millimetres)

ANNEXURE-3

DETAILS OF BARRICADING.



NOTE:

1) ALL DIMENSIONS ARE IN mm

2) FRONT SIDE OF BOARD SHALL BE PAINTED IN BLACK & YELLOW STRIPS AS SHOWN

TYPICAL DETAILS OF BARRICADING BOARD

SECTION VI

EMPLOYER'S REQUIREMENTS

CHAPTER – v
SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT/SUPPLEMENTARY INFORMATION

The following conditions shall prevail:

1.0 CEMENT FOR WORKS

The Contractor shall make his own arrangement for cement. The cement shall be OPC grade 43 for structure by approval of Engineer. The supply of cement shall be of approved manufactures ie ACC/Gujarat Ambuja/ Ultra-tech /Birla of approved grade (43,opc)by the Engineer in Charge.

2.0 ELECTRIC POWER SUPPLY

The Contractor shall make all the necessary arrangement for procurement of electric power required for the work at his own cost. The Contractor shall submit his requirement of Electric Power Supply for carrying out permanent works, operating plants and equipments, 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 not accept any 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.

3.0 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 at his own cost. The employer shall issue the necessary certificates, letters of 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.

4.0 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.

5.0 LAND FOR TEMPORARY USE

Land for labour camps, storage yards temporary site sheds etc., will be arranged by the contractor at his own cost.

6.0 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, Bill of

Quantities and Specifications taken together, whether the same is or is not particularly shown or described therein; provided the same can be reasonably in forced there from. 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.

7.0 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 and 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.

8.0 WORK ORDER BOOK

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

9.0 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 of interest, the contractor shall give immediate notice thereof to the Engineer 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.

10.0 TEMPORARY DIVERSIONS, MAINTENANCE OF SAME AND TRAFFIC MANAGEMENT

In addition to provisions made in the technical specifications, it is stipulated that the contractor shall construct, maintain and carryout the traffic management including safety features, for all temporary diversions.

11.0 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's representative 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.

12.0 ENVIRONMENTAL SAFEGUARDS :- As stated in CLAUSE SP-11 - ENVIRONMENTAL MANAGEMENT PLAN in Annex 1 with addenda.

13.0 PETROL PUMPS

The Employer may give permission to Petroleum Companies to establish Petrol / Diesel Pumps adjacent to the site of work. The suitable location shall be identified by the contractor, after which Employer will take necessary action in the matter.

14.0 REMOVAL / DIVERSION OF UTILITY SERVICE

As far as possible, the Contractor's proposal shall be such that the shifting of utility services is not required. However, if the over ground / underground utility services like electric poles, telephone poles, water supply pipe lines, sewer lines, oil pipe lines, cables, gas ducts etc. owned by various authorities including Public Undertakings and local authorities encountered during construction shall be diverted by the Contractor and will be reimbursed as per the estimate prepared by the concerned PCMC department / other agency and approved by Employer. The work shall be carried out under the supervision of concerned PCMC department / other agency. In case in the opinion of the Engineer it is not possible to divert the utilities, the Contractor shall make necessary modifications in the structure at no extra cost to the client.

15.0 TAXES – Refer Clause Clause 14.1 (b) of GC.

16.0 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 arrangement for the same.

17.0 Additional Obligations:-

1. Any Structure or portion of work if rejected by Employer's Engineer has to be dismantled and removed after receipt of written advice from the Employer's Engineer and redone or modified as per specification and drawing. Cost of which is to be borne by the Contractor.

2. The work of Railway ROB shall be carried under the supervision and presence of concerned Railway Engineer or an authorized Railway supervising Engineer appointed by them. The final acceptance of the work shall be subject to his satisfaction. In case of any rejection of any such portion of work shall be dismantled by the contractor and re-done under Railway's Supervision
3. Design Drawings / Working Drawings before releasing for work shall be submitted to Consulting Engineer appointed by the Employer for Proof Checking of Design done by Contractor's Engineer.
4. Any discrepancy pointed by the Consulting Engineer of Employer shall be corrected and re submitted.
5. The Design and all Drawings of Railway portion of work within Railway Boundary shall be proof checked by Railway approved consulting Engineer and submitted at Design Cell of Central Railway's Chief Engineer's Office by the contractor for final checking and final approval. This also includes for all temporary works erected in Railway portion as well as for launching Scheme of PSC I Girders/steel Girders. All necessary co-ordination with Railway during approval of drawings and during execution of work shall be done by Contractor.
6. Special Conditions while working in the Railway Area.:-

    18.1 No work within Railway area shall be done without the presence of Railway's Engineer or Railway's authorized staff.

    18.2 No work on Railway track shall be undertaken by the contractor unless the traffic Block is sanctioned and arranged by Railway Engineer. The work shall be carried in planned way within duration of sanctioned power and traffic Block in presence of Railway Engineer.

    18.3 During the traffic Block the railway Track shall be protected only by authorized Railway staff deployed by Railway Engineer as per Railway General and subsidiary Rules.

    18.4 No Tools or Equipment or machinery or plant shall be brought or kept in side Railway area without the written permission of Railway Engineer. No tools or equipment shall be kept in side area of Railway track for safe movement of Trains.

    18.5 No material shall be stacked inside Railway without written orders given by Railway Engineer.

    18.6 Any excavation for foundation within 5 meters near Railway track shall be carried only after approval of Railway Engineer. The excavated area shall be barricaded by fencing and it is ensured that such barricade shall be provided at safe distance from Railway Track as per Indian Railways Schedule of Dimensions 2004 and according to specific instruction of Railway Engineer.

    18.7 Contractor shall submit a launching scheme and drawing for launching of PSC I Girders/steel girders with design calculation and Requirement of traffic

blocks etc. for each Phase work for approval of Railways before undertaking such works. The PSC I Girders shall be provided with temporary steel brackets to secure its stability after launching till RCC diaphragms are cast which shall be shown in the launching scheme. If launching is done by Road cranes in the case capacity of the cranes shall be written in the launching scheme. Minimum three cranes shall be used. Out of which one crane will remain at site as stand by in case of failure of any of the other two working cranes. In case steel launching girder is use for launching of PSC I Girders, its structural details drawing with design calculation shall be submitted by the contractor duly proof checked by Railway approved proof checking Engineer for final approval of Railway. The Drawings shall also include Shuttering Arrangement for Deck Slab.

18.8 No vehicles of contractor are permitted to ply within 15m from Railway Track. If it is required to do so, the matter shall be informed well in advance to Railway Engineer so that he may depute his authorized staff with necessary Red flag and protection equipments for such work for safety of Running trains.

18.9 The Vehicle and Crane Drivers of Contractor should have necessary Driving license and competency certificate which shall be produced to Railway Engineer before deployment by the contractor. These drivers should have Photo Identity cards issued by the Contractor. Any Change of such staff should be brought in the knowledge of Railway Engineer in charge well in advance. Railway Engineer shall have right to demand for changing of any such staff who in his view is found incompetent and doing unsafe work in Railway area.

18.10 All staff of Contractor shall maintain Identity card while working in Railway Area. Copy of the same with list of such staff shall be submitted by the contractor to Railway Engineer well in advance. Any change of such staff for the work in Railway area should be informed to Railway Engineer well in advance.

18.11 Contractor has to deploy supervisor and site Engineer who has previous experience to work in the Railway suburban area in view of safety of running trains.

18.12 PSC I Girders/steel girders shall be precast outside and then launched for the ROB by adopting method after Railway Approves Contractor's launching scheme.

18.13 Railway shall neither be responsible in any way for any injury to Contractor's staff or supervisors during the course of work nor it shall be a part for any such injury covered under workman's compensation Act. The contractor has to train his staff to learn Railway safety Rules before deputing them to work in Railway area in consultation with Railway Engineer.

18.14 No scaffolding or ladder shall be provided without presence of Railway Engineer or his authorized staff within 7.5 meter distance from any Railway track.

18.15 While casting Deck Slab of the ROB or providing shuttering work the Contractor shall ensure that no materials or tools fall from ROB over Railway Track to ensure safety of running trains.

18.16 Flyover shall not be commissioned even after completion of the work by the contractor unless necessary formalities are completed and the contractor obtains a satisfactory completion certificate from Railway Engineer for ROB portion.

18.17 During the Defect Liability period the contractor has to attend any maintenance of the ROB as per inspection report of Railway Engineer in presence and under the supervision of Railway Engineer or a authorized supervisor nominated by him.f

AMENDED VOLUME IV (DRAWINGS) WITH SOFT COPY

List of Drawings

1. GENERAL ARRANGEMENT DRAWING (ALIGNMENT PLAN & L-SECTIONS)

2. GENERAL ARRANGEMENT DRAWING FOR BRIDGE ON PAWANA RIVER (COMPONENT NO:-1)

3. GENERAL ARRANGEMENT DRAWING FOR FLYOVER/VIADUCT PORTION FROM PAWANA RIVER UPTO ROB (COMPONENT NO:-2)

4. GENERAL ARRANGEMENT DRAWING FOR ROB PORTION - PROPOSED CONSTRUCTION OF EMPIRE ESTATE ROB @ K.M-176/5-6 BETWEEN PIMPRI AND CHINCHWAD STATIONS ON PUNE – LONAVAL SECTION (COMPONENT NO:-3)

5. GENERAL ARRANGEMENT DRAWING FOR FROM RAIL OVER BRIDGE WITH CROSSING OF EXISTING 61 M WIDE PUNE MUMBAI ROAD (NH-4) WITH APPROACH (COMPONENT NO:-4)

6. GENERAL ARRANGEMENT DRAWING FOR ASCENDING & DESCENDING RAMPS IN EMPIRE ESTATE AREA WITH SERVICE ROAD & CONCRETE ROAD ON PUNE MUMBAI HIGHWAY (COMPONENTNO:-5 , 6 & 8)

7. GENERAL ARRANGEMENT DRAWING DESCENDING RAMP IN FRONT OF PROPOSED CITY CENTRE (COMPONENT NO:-7)

8. GENERAL NOTES.

9. DETAILS OF EXISTING UTILITIES.

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