

Cochin Smart Mission Limited (CSML)

Cochin Smart Mission Limited
10th Floor, Revenue Tower, Park Avenue,
Kochi - 682 011, India.
Phone: 0484-2350355, 2380980
E-mail: csmltenders@gmail.com

CORRIGENDUM

TnD No.: CSML/ TND / 2018 /64 /132

Date: 11/02/2019

Tender Reference Number: CSML/Energy/RFP/002 Date: 26/12/2018

Tender ID: 2018_KMRL_257662_1

Project Name: RFP for Implementation of Smart LED Lights in ABD area of Kochi smart city under smart city mission

SL NO	Page No	RFP Volume & Section	Earlier Clause	Revised Clause
1.	2	NOTICE INVITING TENDER (NIT) (NATIONAL COMPETITIVE BIDDING)	10. Earnest Money Deposit (EMD): Rs. 30,00,000 (Rupees Thirty Lakh Only) in the form of Bank guarantee issued by a scheduled commercial bank in India	10. Earnest Money Deposit (EMD): Rs. 36,00,000 (Rupees Thirty-Six Lakh Only) in the form of Bank guarantee issued by a scheduled commercial bank in India
2.	17	1.1 General Information and Guidelines 1.1.2	VI. In case of a consortium, the lead member should satisfy following Eligibility Criteria. a) Successful bidder should have A-Class electrical license issued by Kerala State Electrical	VI. In case of a consortium, the lead member should satisfy following Eligibility Criteria. a) Successful bidder should have MV / A-Class electrical license issued by Kerala State Electrical

Cochin Smart Mission Limited (CSML)

		Consortium	<p>inspectorate or any other state/UT in India. The license must be submitted at the time of agreement.</p> <p>b) If the bidder does not have a license, they should have an agreement with an All MV / “A” class license holder from Kerala State Electrical Inspectorate. The workmen of the bidding firm who will work on the street lights should have appropriate license of Kerala State Electrical inspectorate and to be produced on demand. In case of consortium, one of the members should satisfy the criteria.</p>	<p>inspectorate or any other state/UT in India. The license must be submitted at the time of agreement.</p> <p>b) If the bidder does not have a license, they should have an agreement with an All MV / “A” class license holder from Kerala State Electrical Inspectorate. The workmen of the bidding firm who will work on the street lights and AB cable system should have appropriate license of Kerala State Electrical inspectorate and to be produced on demand. In case of consortium, one of the members should satisfy the criteria.</p>
3.	19	<p>1.2 Key Requirements of the Bid</p> <p>1.2.2 Earnest Money Deposit (EMD)</p>	<p>a) The Bidder is required to submit an EMD of Rs. 30,00,000 (Rupees Thirty Lakh Only) in the form of Bank guarantee issued by a scheduled commercial bank in India payable at Kochi, Kerala. The validity of BG shall be 28 days beyond the validity of bid.</p>	<p>a) The Bidder is required to submit an EMD of Rs. 36,00,000 (Rupees Thirty-Six Lakh Only) in the form of Bank guarantee issued by a scheduled commercial bank in India payable at Kochi, Kerala. The validity of BG shall be 28 days beyond the validity of bid.</p>
4.	21	<p>1.3 Bid Submission Instructions</p> <p>1.3.2 Bid</p>	<p>Note: AUTHORITY will conduct the bid evaluation based on documents submitted through online e-tendering portal.</p>	<p>Note: AUTHORITY will conduct the bid evaluation based on documents submitted through online e-tendering portal & the hard copies submitted at the address of employer.</p>

Cochin Smart Mission Limited (CSML)

		Submission Instructions		
5.	24	1.4 Evaluation Process 1.4.1 Opening of Bid	<p>a) Total transparency shall be observed and ensured while opening the Bids. All Bids shall be opened online in the presence of Bidder’s representatives who choose to attend the Bid opening sessions on the specified date, time and address.</p> <p>b) The AUTHORITY reserves the rights at all times to postpone or cancel a scheduled Bid opening.</p> <p>c) Bid opening shall be conducted in 2 (Two) Stages; Stage 1 – (A) RFP Document fee & Bid Security/EMD, Technical Proposal including Pre-Qualification Proposal (B) Technical Presentation to be given by technically qualified bidders Stage 2 – The bidders who are technically qualified will be shortlisted for opening of Financial Proposal</p> <p>d) The venue, date and time for opening the</p>	<p>a) Total transparency shall be observed and ensured while opening the Bids. All Bids shall be opened online in the presence of Bidder’s representatives who choose to attend the Bid opening sessions on the specified date, time and address.</p> <p>b) The AUTHORITY always reserves the rights to postpone or cancel a scheduled Bid opening.</p> <p>c) Bid opening shall be conducted in 2 (Two) Stages; Stage 1 – (A) RFP Document fee & Bid Security/EMD, Technical Proposal including Pre-Qualification Proposal (B) Table top presentation shall be made by all bidders with one sample of Decorative LED light fixture and post top light fixture proposed for smart Road and one sample of LED fixture proposed for access road on the date of submission of bid. CSML shall keep the samples of all bidders with it till the issuance of letter of</p>

Cochin Smart Mission Limited (CSML)

			<p>Technical Proposal are mentioned in the Tender Notice in the RFP.</p> <p>e) The venue, date and time of Technical presentation will be communicated to the technically qualified bidders.</p> <p>f) The date and time for opening the Financial Proposals would be communicated to the qualified bidders who meet the lighting levels in the Technical presentation.</p> <p>g) The Financial Proposals of only those bidders who scores equal to or more than 70 (Seventy) marks in Technical Evaluation will be opened.</p> <p>h) The representatives of Bidder's who are present shall sign a register evidencing their attendance. In the event of the specified date of Bid opening being declared a holiday for the AUTHORITY, the bids shall be opened at the same time and location on the next working day. In addition to that, if their representative of the Bidder remains absent, the AUTHORITY shall continue process and open the bids of the all bidders</p> <p>i) During Bid opening, preliminary scrutiny of the Bid documents shall be made to determine whether they are complete,</p>	<p>acceptance to selected bidder. The samples of unsuccessful bidders shall be returned to them & it shall be their responsibility to collect them from the office of CSML at their own cost & risk.</p> <p>Though CSML will take every type of safety measure but it will not be held responsible for any type of damage to the sample</p> <p>Stage 2 – The bidders who are technically qualified will be shortlisted for opening of Financial Proposal</p> <p>d) The venue, date and time for opening the Technical Proposal are mentioned in the Tender Notice in the RFP.</p> <p>e) The date & time of Table Top presentation is on the day of submission of bid</p> <p>f) The date and time for opening the Financial Proposals would be communicated to the qualified bidder only those who scores equal to or more than 75 (Seventy-five) marks in Technical Evaluation.</p> <p>g) The representatives of Bidder's who are present shall sign a register evidencing their attendance.</p>
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Cochin Smart Mission Limited (CSML)

			<p>whether required EMD has been furnished, whether the Documents have been properly signed, and whether the bids are generally in order. Bids not conforming to such preliminary requirements shall be prima facie rejected. The AUTHORITY has the right to reject the bid after due diligence is done.</p>	<p>In the event of the specified date of Bid opening being declared a holiday for the AUTHORITY, the bids shall be opened at the same time and location on the next working day. In addition to that, if their representative of the Bidder remains absent, the AUTHORITY shall continue process and open the bids of the all bidders</p> <p>h) During Bid opening, preliminary scrutiny of the Bid documents shall be made to determine whether they are complete, whether required EMD has been furnished, whether the Documents have been properly signed, and whether the bids are generally in order. Bids not conforming to such preliminary requirements shall be prima facie rejected. The AUTHORITY has the right to reject the bid after due diligence is done.</p>
6.	26	1.1 Evaluation Process 1.4.3 Technical Presentation	1.4.3 Technical Presentation	This clause stands deleted.
7.	26	1.1 Evaluation Process	<p>1.4.4 Evaluation of Financial Proposal</p> <p>a) The Financial proposals of Bidders who do not</p>	<p>1.4.4 Evaluation of Financial Proposal</p> <p>a) The Financial proposals of Bidders who do not</p>

Cochin Smart Mission Limited (CSML)

		<p>1.4.4 Evaluation of Financial Proposal</p>	<p>qualify technically shall not be opened in the e- Tendering system.</p> <p>b) Financial Proposals of only those bidders who meet the lux level requirement of roads, and parameters like control, dimming etc., in the Technical Presentation will be opened for evaluation.</p> <p>c) Financial Proposals that are not meeting the condition mentioned in Annexure 3 shall be liable for rejection.</p> <p>d) The bidder who has quoted lowest price, after meeting the minimum lux level requirement in the Technical presentation after arithmetic correction will be declared as L1 bidder.</p> <p>e) If there is a discrepancy between the unit price and the line total amount that is obtained after multiplying unit price with the quantity, the unit price shall prevail and the line total amount shall be corrected, unless in the opinion of the Employer there is an obvious gross misplacement of the decimal point in the unit price, in which case the line item total amount as quoted shall govern and unit price shall be corrected.</p> <p>f) If there is error in a total corresponding to addition or subtraction of subtotals, the Sub</p>	<p>qualify technically shall not be opened in the e- Tendering system.</p> <p>b) Bidders bringing sample only will be considered for financial evaluation.</p> <p>c) Financial Proposals that are not meeting the condition mentioned in Annexure 3 shall be liable for rejection.</p> <p>d) The bidder who has quoted lowest price inclusive of GST, after arithmetic correction will be declared as L1 bidder. Basic rate of item or tax rate quoted by the bidder shall not be considered while evaluating the financial offers. It will be responsibility of the bidder to deposit correct amount of GST to Govt. Bidder shall hold CSML harmless in case of any dispute related to GST with Govt authority.</p> <p>e) If there is a discrepancy between the unit price and the line total amount that is obtained after multiplying unit price with the quantity, the unit price shall prevail and the line total amount shall be corrected, unless in the opinion of the Employer there is an obvious gross misplacement of the decimal point in the unit price, in which case the line item total amount as quoted shall govern and unit price shall be corrected.</p> <p>f) If there is error in a total corresponding to</p>
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Cochin Smart Mission Limited (CSML)

			<p>totals shall prevail and the total shall be corrected and If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in such case the amount in figure shall prevail subject to (ii) above.</p>	<p>addition or subtraction of subtotals, the Sub totals shall prevail and the total shall be corrected and If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in such case the amount in figure shall prevail subject to (ii) above.</p>
8.	27	<p>1.1 Evaluation Process</p> <p>1.4.6 Instructions to Tenderers</p>	<p>a. The agency interested in performing the work has to qualify the pre-qualification criteria.</p> <p>b. (Technical (including Pre-qualification) bids will be opened on date as per NIT.</p> <p>c. Technically qualified bidders have to make a Technical presentation of their offer on selected roads. The lux level requirement in selected road will be evaluated by an independent agency.</p> <p>d. Financial Bid of only those Tenderers will be opened who qualify the pre- qualification criteria in the Technical presentation and technical bid.</p> <p>e. The bids received after the last date and time prescribed in the tender document shall be rejected.</p> <p>f. The Tenderer is advised to carefully examine all instructions and abide to the terms & conditions specified in the Tender Document for filling up the tender form. Failure to</p>	<p>a. The agency interested in performing the work has to qualify the pre-qualification criteria.</p> <p>b. Technical (including Pre-qualification) bids will be opened on date as per NIT.</p> <p>c. The bidders who submit the bid shall make a Table top presentation of sample of each category on the date of submission of bid. The samples of decorative type LED street light and Post top fixtures will evaluated for technical qualification.</p> <p>d. Financial Bid of only those Tenderers will be opened who submit the samples and make table top presentation and qualify the pre-qualification criteria in technical bid.</p> <p>e. The bids received after the last date and time prescribed in the tender document shall be rejected.</p> <p>f. The Tenderer is advised to carefully examine all instructions and abide to the terms & conditions specified in the Tender Document for filling up the tender form. Failure to furnish all the</p>

Cochin Smart Mission Limited (CSML)

			<p>furnish all the information required in the Tender Document, or submission of a bid not substantial responsive to the Tender Document in every respect might result in rejection of the tender.</p> <p>g. Conditional tenders will not be accepted.</p> <p>h. The Managing Director, CSML, Kochi reserves the right to reject any or all tender / offers without assigning any reason thereof.</p> <p>i. NOTE: Even though the applicant satisfies the eligibility criteria, they are likely to be disqualified if they:</p> <ol style="list-style-type: none"> 1) Make untrue or false representation in the forms, statements and attachments furnished in response to above clause and or having 2) Records of poor performance such as abandoning of works, not properly completing the contracts or financial failure etc. 	<p>information required in the Tender Document, or submission of a bid not substantial responsive to the Tender Document in every respect might result in rejection of the tender.</p> <p>g. Conditional tenders will not be accepted.</p> <p>h. The Managing Director, CSML, Kochi reserves the right to reject any or all tender / offers without assigning any reason thereof.</p> <p>i. NOTE: Even though the applicant satisfies the eligibility criteria, they are likely to be disqualified if they:</p> <ol style="list-style-type: none"> 1) Make untrue or false representation in the forms, statements and attachments furnished in response to above clause and or having 2) Records of poor performance such as abandoning of works, not properly completing the contracts or financial failure etc.
9.	28	<p>1.4 Evaluation Process</p> <p>1.4.7 Pre-Qualification Criteria</p> <p>1.4.7.1 Eligibility Criteria FOR</p>	<p>b) The bidder could be either a manufacturer or an authorized supplier of LED type street lights having installation, commissioning, operation & maintenance agency. If the bidding firm is not manufacturer of LED street light fixtures, he must submit copy of authorization from the LED street light manufacturer stating that it will supply LED street light fixtures and its spares as</p>	<p>b) The bidder could be either a manufacturer or an authorized supplier of LED type street lights having installation, commissioning, operation & maintenance agency. If the bidding firm is not manufacturer of LED street light fixtures, he must submit copy of authorization from the LED street light manufacturer stating that it will supply LED street light fixtures and its spares as per technical</p>

Cochin Smart Mission Limited (CSML)

		BIDDER:	<p>per technical specifications of this tender. One bidder can give offer with the authorization of only one manufacturer only. Multiple authorizations shall not be acceptable. However, a manufacturer can give its authorization to more than one bidder. If manufacturer directly submits the bid, he cannot submit more than one bid (whether as sole bidder or in consortium). Successful bidder should have A-Class electrical license issued by Kerala State Electrical Inspectorate or any other state /UT in India. The license must be submitted at the time of agreement.</p>	<p>specifications of this tender. One bidder can give offer with the authorization of one manufacturer only for one category of product. For example, the lights in Smart Roads can be from one vendor, Similarly, lights for access Roads may be from another vendor. However, a manufacturer can give its authorization to more than one bidder. If manufacturer directly submits the bid, he cannot submit more than one bid (whether as sole bidder or in consortium). Successful bidder should have MV / A-Class electrical license issued by Kerala State Electrical Inspectorate or any other state /UT in India. The license must be submitted at the time of agreement.</p> <p>The bidder should have experience in execution of LT Aerial Bunched cable system in any Electrical utility. If the bidder does not have experience in execution of Aerial Bunched cable system, the work shall be executed through an experienced contractor. The contractor shall have executed similar type of work in KSEB or any other state utility.</p>
10.	29	1.4 Evaluation Process		

Cochin Smart Mission Limited (CSML)

		1.4.7 Pre- Qualification Criteria	S I . N O	Basic Requ irem ent	Specific Require ments	Docume nts Requir ed	S I . N O	Basic Requir ement	Specific Require ments	Documents Required
		1.4.7.1 Eligibility Criteria FOR BIDDER:	P Q 2	Turnov er	The Sole Bidder or the consortium members put together should have average annual turnover of at least Rs.9.01 crores in lighting business in last three financial years (2015-16, 2016-17 and 2017-18) including lighting manufacturing business as per last audited financial year ending March 2017. The consortium can be among (i) LED street light manufacturer, (ii) a company with experience of O&M	<ul style="list-style-type: none"> • Certificate from the Statutory Auditor and Annual Audit Reports clearly mentioning that the turnover is from required business. 	P Q 2	Tur nov er	The Sole Bidder or the consortium members put together should have average annual turnover of at least Rs.10.75 crores in lighting business in last three financial years (2015-16, 2016-17 and 2017-18) including lighting manufacturing business as per last audited financial year ending March 2018. The consortium can be among (i)	<ul style="list-style-type: none"> • Certificate from the Statutory Auditor and Annual Audit Reports clearly mentioning that the turnover is from required business.

Cochin Smart Mission Limited (CSML)

				<p>of street lighting & (iii) a All MV / Class A Electrical contractor registered in Kerala or any other state/UT in India.</p>				<p>LED street light manufacturer, (ii) a company with experience of O&M of street lighting & (iii) All MV / Class A Electrical contractor registered in Kerala or any other state/UT in India. Also, in case of consortium, it should satisfy the following: (i) Lead member of consortium shall have minimum average annual Turnover of 51% of Rs. 10.75 Crore</p>	
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Cochin Smart Mission Limited (CSML)

			P Q 3	<p>Experience</p> <p>(1) The Sole Bidder or all members of its consortium put together should have successfully supplied, installed and commissioned one Smart Lighting project in at least 1 city / ULB of cost not less than Rs. 12.02 Crores in last 5 (Five) years starting from 1st December 2013 to 30th November 2018. <u>The date of work order and date of completion as mentioned in certificate must fall in between above time period.</u></p> <p>(2) The bidder should have at least three-year experience (up to the date of publication of this RFP) of implementation of Flood Lighting, street light project with centralized control of at least 2000 lighting fixtures in urban</p>	<ul style="list-style-type: none"> • Copy of Work Order(s) • Copy of completion certificate(s) 		P Q 3	<p>Experience</p> <p>(1) The Sole Bidder or all members of its consortium put together should have successfully supplied, installed and commissioned one Smart Lighting project in at least 1 city / ULB of cost not less than Rs. 14.35 Crores in last 5 (Five) years starting from 1st December 2013 to 30th November 2018. <u>The date of completion as mentioned in certificate must fall in between above time period.</u></p> <p>(2) The bidder should have at least three-year experience (up to the date of publication of this RFP) of implementation of smart street light project with centralized control of at least 2000</p>	<ul style="list-style-type: none"> • Copy of Work Order(s) • Copy of completion certificate(s) <p>The certificate must clearly show that the work executed is of Smart Light nature.</p> <p>Smart street lighting consists of Street lighting system which can be controlled and monitored from a remote-control room through a software application (lighting management system) hosted in a cloud. The system includes control system for individual and group control, associated communication devices and the</p>
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Cochin Smart Mission Limited (CSML)

				area and in hand order for operation and maintenance of Flood Lighting, street /central LED lighting of at least 1000 lighting fixtures for an urban area. The experience as an approved subcontractor will be considered only when it is in agreement with the main contractor and should be with the legal contract along with certificate from the concerned department.			lighting fixtures in urban area and (3) Completed one project of operation and maintenance of smart street /central lighting of at least 3500 lighting fixtures for an urban area. The experience as an approved subcontractor will be considered only when it is in agreement with the main contractor and should be with the legal contract along with certificate from the concerned department.	software application. The system shall be able to record and provide parameters various intervals like voltage, current, power factor, power etc. The application shall receive and record all data from street light controllers, status of street lights, setting new on / off timings and measurement etc.	
11.	32	1.4 Evaluation Process 1.4.7 Pre- Qualification Criteria 1.4.7.3	Criteria	Maximum Marks (Weight ages)	Method of allotting marks for technical score		Criteria	Maximum Marks (Weight ages)	Method of allotting marks for technical score

Cochin Smart Mission Limited (CSML)

	Technical Evaluation Criteria (Supporting documents to be attached)	Financial Capability – Annual Turnover – Sole bidders or lead bidder’s average annual audited turnover for the period FY 2015-16, 2016-17 & 2017-18	20 Marks	Sole Bidder / all members of consortium put together with turnover will be awarded 20 marks as given below. From 9.01 Cr up to 15 Cr – 10 marks Above 15 Cr up to 22.5 Cr – 13 marks Above 22.5 Cr up to 30 Cr – 16 marks Above 30 Cr – 20 Marks	Financial Capability – Annual Turnover – Sole bidders or lead bidder’s average annual audited turnover for the period FY 2015-16, 2016-17 & 2017-18	15 Marks	Sole Bidder / all members of consortium put together with turnover will be awarded 20 marks as given below. Rs 10.75 Cr – 11 marks Equal to or above Rs 21.5 Cr – 15 Marks Proportionate marks shall be awarded for turn over between Rs 10.75 Cr to Rs 21.50 Cr
		Experience of implementing Smart Lighting system (supply installation and commissioning) comprising minimum 1500 lights in India Copy of the Client Certificate as a proof has to be attached. Marks shall be awarded on the	15 marks	Sole Bidder / all members of consortium put together having executed project worth. From 12.02 Cr up to 20 Cr – 5 marks Above 20 Cr up to 30 Cr – 10 marks Above 30 Cr – 15 Marks	Experience of implementing Smart street Lighting system (supply installation and commissioning) comprising minimum 2000 lights in India Copy of the Client Certificate as a	15 marks	Sole Bidder / all members of consortium put together having executed project worth. Rs 14.35 Cr – 11 marks Equal to or above Rs 28.70 Cr – 15 Marks

Cochin Smart Mission Limited (CSML)

			<p>basis of individual projects. Bidder can submit multiple projects subject to maximum marks.</p>			<p>proof must be attached. Marks shall be awarded based on individual projects. Bidder can submit multiple projects subject to maximum marks.</p>	<p>Proportionate marks shall be awarded for work experience</p>		
			<p>Experience of implementing Smart Lighting system (supply installation and commissioning) comprising minimum 1500 lights in India</p> <p>Copy of the Client Certificate as a proof has to be attached</p>	20 Marks	<p>Sole bidder / any member of Consortium having implemented.</p> <p>2 smart LIGHTING project – 10 mark</p> <p>3 smart LIGHTING project – 15 mark</p> <p>more than 3 Smart LIGHTING project – 20 mark</p>			<p>15 Marks</p>	<p>Sole bidder / any member of Consortium having implemented.</p> <p>1 Smart Lighting project –11 marks</p> <p>Equal to or more than 4 Smart Lighting projects - 15 marks.</p> <p>Proportionate marks shall be awarded for work experience</p>
			<p>Experience in Operation and Maintenance project of Street Lighting system comprising of minimum 1500 lights in a city / ULB of India in a</p>	20 Marks	<p>Sole bidder / any member of Consortium having carried out Operation and Maintenance of Street Lighting system comprising of minimum 1500</p>				

Cochin Smart Mission Limited (CSML)

			single Contract		LIGHTING lights 2 projects – 10 marks 3 projects – 15 Marks More than 3 projects - 20 marks.	<p>Experience in Operation and Maintenance project of smart Street Lighting system comprising of minimum 3500 lights in a city / ULB of India in a single Contract</p> <p>Copy of the Client Certificate as a proof has to be attached</p>	<p>10 Marks</p>	<p>Sole bidder / any member of Consortium having carried out Operation and Maintenance of Street Lighting system comprising of minimum 3500 LIGHTING lights 1 project – 7 marks Equal to or more than 4 projects - 10 marks. Proportionate marks shall be awarded for work experience</p>
		Experience in operation of maintenance of Smart Street light system with luminaires in a single project. Multiple projects also will be considered. Copy of the Client Certificate as a proof has to be attached. Marks shall be awarded on the basis of individual projects. Bidder can submit multiple projects subject to	15 Marks	Experience in maintenance of Smart street light luminaires 1501 nos to 2000 nos – 08 marks 2001 nos to 3000 nos – 10 marks 3001 nos to 4000 nos – 12 marks 4001 & above – 15 marks	<p>Experience in operation of maintenance of Smart Street light system with luminaires in a single project. Multiple projects also</p>			

Cochin Smart Mission Limited (CSML)

			<table border="1"> <tr> <td>maximum marks.</td> <td></td> <td></td> </tr> <tr> <td>The identity of the Bidder</td> <td>10 Marks</td> <td>If sole bidder or any member of the consortium is an LED light Manufacturer will be awarded with 10 marks.</td> </tr> </table>	maximum marks.			The identity of the Bidder	10 Marks	If sole bidder or any member of the consortium is an LED light Manufacturer will be awarded with 10 marks.	<p>will be considered.</p> <p>Copy of the Client Certificate as a proof must be attached.</p> <p>Marks shall be awarded based on individual projects. Bidder can submit multiple projects subject to maximum marks.</p>		
maximum marks.												
The identity of the Bidder	10 Marks	If sole bidder or any member of the consortium is an LED light Manufacturer will be awarded with 10 marks.										
				<p>The identity of the Bidder</p>		<p>Deleted</p>						
				<p>Nominal system efficacy of LED street light in smart Road and access road in Lumens/Watt.</p> <p>The bidder must produce LM-79 report in</p>	<p>10 marks</p>	<p>System efficacy of 115 Lumens /W to 120 lumens/watt--- 7 marks</p> <p>Equal to or more than 120 L/W – 10 marks</p> <p>Proportionate marks shall be awarded for stem efficacy</p>						

Cochin Smart Mission Limited (CSML)

				support of their claim		LM79 certificate from NABL accredited testing agency report to be submitted to substantiate their claim
				Implementation of Smart Lighting Management Software & integration with Integrated Command & Control Centre Certificate from client in support of bidder's claim is to be submitted	10 Marks	Implemented one Smart Lighting Management Software on cloud with a city App. – 5 marks Integrated Smart Lighting Management System with cities Integrated command & control center – 5 marks
				Verification of Sample of each category of light. Each Bidder participating in	15 Marks	Aesthetic appeal of LED street light fixture of smart roads - 5 marks. Architectural detailing LED street light fixture of Smart Roads - 5

Cochin Smart Mission Limited (CSML)

				the bidding process must submit the sample of each category of light to CSML for verification on the day of submission of Bid.	marks
12.	34	1.5 Award of Contract 1.5.1 Award Criteria	The cost indicated in the Financial Proposal shall be deemed as final and reflecting the total cost of services and should be stated in INR only. Omissions, if any, in costing of any item shall not entitle the Bidder to be compensated and the liability to fulfil its obligations as per the Terms of Reference within the total quoted price shall be that of the Bidder. The Bidder shall bear all taxes, duties, fees, levies and other charges imposed under the Applicable Law as applicable. The bidder who has scored 70% & more marks will be technically qualified. The technically qualified bids have to make a Technical presentation of street lighting system in selected road. The bidder has to carry all necessary items and testing equipment's, man	The cost indicated in the Financial Proposal shall be deemed as final and reflecting the total cost of services and should be stated in INR only. Omissions, if any, in costing of any item shall not entitle the Bidder to be compensated and the liability to fulfil its obligations as per the Terms of Reference within the total quoted price shall be that of the Bidder. The Bidder shall bear all taxes, duties, fees, levies and other charges imposed under the Applicable Law as applicable. The bidder who has scored 75% & more marks will be technically qualified. The technically qualified bids have to make a Technical presentation of street lighting system in selected road. The bidder has to carry all necessary items and testing equipment's, man power for Technical presentation at their own	Overall workmanship and Quality of LED street light fixture of Smart Roads - 5 marks

Cochin Smart Mission Limited (CSML)

			<p>power for Technical presentation at their own cost. The lighting level will be checked as per standards by an independent agency whose fees shall be borne by CSML. Financial Bid of bidders who meets the lighting level in the Technical presentation will be opened and bidder who has quoted lowest bid price post correction of arithmetic error will be considered as L-1 bidder.</p>	<p>cost. The lighting level will be checked as per standards by an independent agency whose fees shall be borne by CSML. Financial Bid of bidders who meets the lighting level in the Technical presentation will be opened and bidder who has quoted lowest bid price post correction of arithmetic error will be considered as L-1 bidder. CSML shall take into account all Taxes (Including but not limited to GST), Duties & Levies for the purpose of financial evaluation. The bidder shall be responsible veracity of GST tax rate quoted by him. In case of any discrepancy, the bidder shall have to bear all the cost & shall hold CSML harmless in case of any dispute with Govt Authority.</p>																				
13.	41	<p>2. SCOPE OF WORK AND TERMS OF REFERENCE</p> <p>2.5 Technical requirement</p>	<p>2.5 Technical requirement</p> <table border="1"> <thead> <tr> <th>Application</th> <th>Street lighting</th> </tr> </thead> <tbody> <tr> <td>Rated voltage (Vref)</td> <td>270 volts AC</td> </tr> <tr> <td>Rated frequency</td> <td>50Hz</td> </tr> <tr> <td>Usage</td> <td>Minimum 10 hours</td> </tr> <tr> <td>Color</td> <td>Day light (Cool White)</td> </tr> </tbody> </table> <p>However, the materials should be robust enough to withstand and work satisfactorily with the following system variations: Voltage: Vref 140-270 V Frequency: 50Hz +/-5%.</p>	Application	Street lighting	Rated voltage (Vref)	270 volts AC	Rated frequency	50Hz	Usage	Minimum 10 hours	Color	Day light (Cool White)	<p>2.5 Technical requirement</p> <table border="1"> <thead> <tr> <th>Application</th> <th>Street lighting</th> </tr> </thead> <tbody> <tr> <td>Rated voltage (Vref)</td> <td>270 volts AC</td> </tr> <tr> <td>Rated frequency</td> <td>50Hz</td> </tr> <tr> <td>Usage</td> <td>Minimum 10 hours</td> </tr> <tr> <td>Color</td> <td>(Neutral white) - 4000 Deg K</td> </tr> </tbody> </table> <p>However, the materials should be robust enough to withstand and work satisfactorily with the following system variations: Voltage: 140-270 V RMS.</p>	Application	Street lighting	Rated voltage (Vref)	270 volts AC	Rated frequency	50Hz	Usage	Minimum 10 hours	Color	(Neutral white) - 4000 Deg K
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Cochin Smart Mission Limited (CSML)

				Frequency: 50Hz +/-3%.
14.	43	<p>2. SCOPE OF WORK AND TERMS OF REFERENCE</p> <p>2.7 Major activities:</p>	<p>The following are the major activities</p> <p>a) Supply, installation, testing and commissioning of street light systems with Galvanized type light poles including bracket with LED luminaire, CCMS panels for smart roads.</p> <p>b) Replacement of conventional, Non-LED type High Mast lights with equivalent wattage of dimmable type LED lighting fixtures in ABD area of KMC and control the lights from CCMS panel and as per the technical specifications of this RFP.</p> <p>c) Replacement of existing lighting cum 415 V electric pole with octagonal type GI poles suitable for 415 V electric line as well LED Street light for all roads other than smart roads in ABD area. The design of the pole shall be got approved from KSEB prior to procurement.</p> <p>d) Providing suitable earthing of electric / lighting poles, CCMS panels and lighting control server for optimum performance and safety of LED street lighting fixtures.</p> <p>e) Installation, testing and commissioning of all smart ICT components and software mentioned in technical specifications of this</p>	<p>The following are the major activities</p> <p>a) Supply, installation, testing and commissioning of decorative type street light fixtures on new Architectural Galvanized type light poles including bracket with LED luminaire, CCMS panels for smart roads.</p> <p>b) Replacement of conventional, Non-LED type High Mast lights with equivalent wattage of dimmable type LED lighting fixtures in ABD area of KMC and control the lights from CCMS panel and as per the technical specifications of this RFP.</p> <p>c) Design, supply, transportation and installation of Composite GI pole in place of existing lighting cum 415 V electric pole with octagonal type GI poles suitable for laying 415 V, 3CX95+1CX70+1CX16 Aerial Bunched Cable instead of bare overhead ACSR conductors as well LED Street light for all roads other than smart roads in ABD area. The scope of work also includes connection of Aerial Bunch cable at LT side of transformers with cable connectors and service connection to individual connections from junction box at light poles. The</p>

Cochin Smart Mission Limited (CSML)

			<p>RFP.</p> <p>f) The serial numbers on each lighting fixtures and poles assigned for GIS mapping shall be as per the approval from client.</p> <p>g) Operation and maintenance of lighting system including maintenance of poles of ABD area for a period of five years from the date of commissioning of lighting system.</p>	<p>design of the pole shall be got approved from KSEB prior to procurement.</p> <p>d) Supply, installation, testing and commissioning of decorative type LED street light fixtures on 5-meter architectural GI poles from Jose Junction to south Railway Station Road and illumination of Gandhi statue in DH road and Jos Junction area with RGB lights, voltage stabilizers, all power, control, communication cables and controllers with all accessories complete in all respect</p> <p>e) Supply and implementation of street Light Management system software and integration of Street Light Management Software with Integrated Command and Control Centre.</p> <p>f) CONTRACTOR shall have to establish well-furnished site office in Ernakulam for his supervisory staff and for project meetings with Employer/Engineer. Site office shall be approved by the Employer.</p> <p>g) Providing suitable earthing of electric / lighting poles, CCMS panels and lighting control panels for optimum performance and safety of LED street lighting fixtures.</p> <p>h) Installation, testing and commissioning of all smart ICT components and software mentioned in technical specifications of this RFP.</p> <p>i) The serial numbers on each lighting fixtures and</p>
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Cochin Smart Mission Limited (CSML)

				poles assigned for GIS mapping shall be as per the approval from client. i) Operation and maintenance of lighting system including maintenance of poles of ABD area for a period of five years from the date of commissioning of lighting system.
15.	44	2. SCOPE OF WORK AND TERMS OF REFERENCE 2.8 Scope of work	h. The bidder will have full responsibility of warranty of all equipment's such as street light poles, LED's/fixture, CCMS panels, cables etc. for the entire contract period. He will pass on the warrantee for remaining period to the client.	h. The bidder will have full responsibility of warranty of all equipment's such as street light poles, LED's/fixture, feeder pillar cum CCMS panels, AB cables, power cables, communication devices, etc. for the entire contract period. He will pass on the warrantee for remaining period to the client.
16.	47	2. SCOPE OF WORK AND TERMS OF REFERENCE 2.8 Scope of work 2.8.2 Drawings/ Data / Documents to be submitted:	a) List of drawings and drawing numbering system. b) Quality assurance plan (QAP) of all material and Test certificate of each equipment & components including type test certificates. c) Single Line Diagram with ratings and wiring diagrams of CCMS panel / Lighting distribution panel. d) Cable route drawings and general arrangement (GA) drawings. e) Cable schedules, termination schedules and cable routing drawings along with cable tags. f) Mapping of Poles and lights g) Any other drawings as required shall be	a) List of drawings and drawing numbering system. b) Lighting design basis report for all the roads covering the lux level calculation, lux distribution and all other details corresponding to the type of lighting fixture selected for the road. c) Lighting layout indicating the location of poles/fixtures, CCMS panels, cable routing, existing equipment etc. The initial road survey report will be shared with the successful Bidder for preparing the layout drawings. The successful Bidder shall verify and revalidate the survey drawing before starting the work.

Cochin Smart Mission Limited (CSML)

			<p>finalized during engineering stage.</p>	<ul style="list-style-type: none"> d) Separate drawing shall be submitted for AB cable routing and the service connection details for the approval of KSEB e) GA drawing and data sheets of Light poles, LED light fixtures, AB Cable accessories, Feeder pillar cum CCMS panel, communication system and all other equipment/devices covered in the scope of work. f) Communication architecture for the individual control and group control of lighting fixtures and the interface details with the command and control centre. g) Functional design specification for the LMS h) Foundation details of poles and feeder pillars. i) Quality assurance plan (QAP) of all material and Test certificate of each equipment & components including type test certificates. j) Single Line Diagram with ratings and wiring diagrams of CCMS panel / Lighting distribution panel. Circuit and phase wise load distribution details shall be indicated in the SLD k) Cable route drawings and general arrangement (GA) drawings. l) Cable schedules, termination schedules and cable routing drawings along with cable tags. m) Mapping of Poles and lights
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Cochin Smart Mission Limited (CSML)

				n) Any other drawings as required shall be finalized during engineering stage.
17.	48	2. SCOPE OF WORK AND TERMS OF REFERENCE 2.8 Scope of work 2.8.5 Factory inspection:	Up on approval of Guaranteed Technical Particulars of LED fixtures, poles, CCMS, duct pipes, earthing materials etc. the contractor has to arrange factory inspection by client with relevant tests of each items are to done prior to dispatch of materials.	Upon approval of Guaranteed Technical Particulars of LED fixtures, poles, CCMS, duct pipes, cables , earthing materials etc. the contractor has to arrange factory inspection by client or its representative / KSEB with relevant tests of each items are to be done prior to dispatch of materials. All the cost related to Factory Inspection and test of items shall be borne by the successful bidder
18.	48	2. SCOPE OF WORK AND TERMS OF REFERENCE 2.8 Scope of work 2.8.7 Site Acceptance Test (SAT)	The items received at project site has to undergo the Site Acceptance Test before installation. The materials are to be subjected to visual inspection and other site test prior to installation. a) Cable – check for physical damage, insulation damage and megger testing. b) Poles – Physical damage, galvanization thickness etc. c) Light fixture – Physical damage, glass breakage etc. d) CCMS panels – Physical damage, Insulation resistance value etc.	The items received at project site has to undergo the Site Acceptance Test before installation. The materials are to be subjected to visual inspection and other site test prior to installation. a) Cable – check for physical damage, insulation damage and megger testing. b) Poles – Physical damage, galvanization thickness, Thickness and quality of PU paint coating etc. c) Light fixture – Physical damage, glass breakage etc. d) CCMS panels – Physical damage, Insulation resistance value etc. e) Aerial Bunch Cables and accessories - check for physical damage, insulation damage and megger testing.

Cochin Smart Mission Limited (CSML)

19.	50	<p>2. SCOPE OF WORK AND TERMS OF REFERENCE</p> <p>2.8 Scope of work</p> <p>2.8.13 Project Staff</p>	<p>a) Project In charge (Degree/ Diploma in Electrical / Electronic Engineering) having experience of at least 12 years out of which at least 5 years should be in lighting industry....1 No.</p> <p>b) Site Engineers (Degree/ Diploma in Electrical Engineering) having experience of at least 5 years 2 Nos.</p> <p>c) Gangs consisting of one supervisor and minimum 3 nos. trained technician / helpers..... 8 nos.</p>	<p>a) Project In charge (Degree/ Diploma in Electrical / Electronic Engineering) having experience of at least 12 years out of which at least 5 years should be in lighting industry....1 No.</p> <p>b) Site Engineers (Degree/ Diploma in Electrical Engineering) having experience of at least 5 years 2 Nos.</p> <p>c) Gangs consisting of one supervisor and minimum 3 nos. trained technician / helpers..... 8 nos.</p> <p>d) Safety Officer – Degree/ Diploma in Safety having experience of at least 5 years in similar work.... 1 no.</p> <p>e) Electrical supervisor – Diploma/ ITI in Electrical engineering trade with min 3 years’ experience in installation of LT Aerial Bunched cables 1 no.</p> <p>f) Electrical work Permit Holder – Diploma/ITI in Electrical Engineering and experience in taking work permit from Kerala State Electricity Board for carrying out shutdown wok of 415 Volt distribution system..... 1 no.</p>
20.	50	<p>2. SCOPE OF WORK AND TERMS OF REFERENCE</p> <p>2.8 Scope of work</p> <p>2.8.14</p>	<p>a) The gangs will work in all days including Sundays, holidays & night hours as per the requirement of engineer in charge.</p> <p>b) The Contractor shall provide proper marking on all poles and serial nos. with colour code on all lighting fixtures.</p> <p>c) The Contractor shall establish store and testing facility to ensure proper stock of spares and facilitate testing of all</p>	<p>a) The workmen engaged for maintenance work must have license to carryout electrical work in Kerala State Electricity Board.</p> <p>b) The gangs will work in all days including Sundays, holidays & night hours as per the requirement of engineer in charge.</p> <p>c) The Contractor shall provide proper marking on all poles and serial nos. with colour code on all lighting fixtures.</p>

Cochin Smart Mission Limited (CSML)

		<p>Maintenance Work</p>	<p>components of lighting system.</p> <p>d) All workmen, staff and engineers of Contractor shall ensure that all installation, operation and maintenance activities are carried out with full safety and by using all safety aids like helmets, gloves, earthing devices, testing gadgets. All electrical safety rules and regulations as per Indian Electricity act, Kerala Government electric supply code and regulations, statutory inspection by electrical inspector etc., must be followed by the Contractor during the contract period.</p> <p>e) The Contractor shall be responsible for all compensation / liability due to any injury or death of any personnel while performing duties related to the work under this contract. CSML/KMC shall not be responsible in any such case and shall not be liable for any compensation in this regard.</p> <p>f) All workmen, staff and engineers of contractor should follow a proper dress code while on duty.</p> <p>g) The Contractor shall establish and maintain a state of art 24x7 command and control cum call centre to receive and address all complaints related to lighting system and to monitor and manage entire smart controls of intelligent LED lighting system. This will be equipped with all computer, hardware, software, display system, PA system. This</p>	<p>d) The Contractor shall establish store and testing facility to ensure proper stock of spares and facilitate testing of all components of lighting system.</p> <p>e) All workmen, staff and engineers of Contractor shall ensure that all installation, operation and maintenance activities are carried out with full safety and by using all safety aids like helmets, gloves, earthing devices, testing gadgets. All electrical safety rules and regulations as per Indian Electricity act, Kerala Government electric supply code and regulations, statutory inspection by electrical inspector etc., must be followed by the Contractor during the contract period.</p> <p>f) The Contractor shall be responsible for all compensation / liability due to any injury or death of any personnel while performing duties related to the work under this contract. CSML/KMC shall not be responsible in any such case and shall not be liable for any compensation in this regard.</p> <p>g) All workmen, staff and engineers of contractor should follow a proper dress code while on duty.</p> <p>h) The Contractor shall establish and maintain a state of art 24x7 call centre to receive and address all complaints related to lighting system and to monitor and manage entire smart controls of intelligent LED lighting system. The contractor shall establish an online complaint</p>
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Cochin Smart Mission Limited (CSML)

			<p>command and control centre should be hooked up with the central command and control system of Kochi Smart City with open protocols.</p> <p>h) The bidder needs to provide the support during the entire project period through its local representative (1st level support) whose details indicating name, postal address with pin code, e-mail, contact number and fax shall be furnished.</p> <p>i) The local representative shall extend necessary support to CSML/KMC for successful implementation of the project. All calls related to the project for resolving any issues shall be registered with the local representative by CSML/ KMC during working hours from 9:00AM to 05:00 PM on all working days.</p>	<p>management system and a citizen App as part of SLMS. The Street Light Management System shall be hooked up with the central command and control system of Kochi Smart City with open protocols.</p> <p>i) The bidder needs to provide the support during the entire project period through its local representative (1st level support) whose details indicating name, postal address with pin code, e-mail, contact number and fax shall be furnished.</p> <p>j) The local representative shall extend necessary support to CSML/KMC for successful implementation of the project. All calls related to the project for resolving any issues shall be registered with the local representative by CSML/ KMC during working hours from 9:00AM to 05:00 PM on all working days.</p> <p>k) O&M shall be initiated after completion of installation and commissioning of street lighting system on all the specified roads and issue of completion certificate by CSML after due inspection and testing.</p> <p>l) CONTRACTOR shall install a Help Desk minimum 30 days in advance before the initiation of the O&M period.</p> <p>m) The CONTRACTOR shall be responsible for maintaining/ repair/ replacement, comprehensively, of all the Luminaires, Switching point controller panels, communication devices cables and earthing systems along with updation</p>
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Cochin Smart Mission Limited (CSML)

				<p>of LMS and associated Cloud services installed in the allocated area during the tenure of the contract.</p> <p>n) CONTRACTOR may maintain a service team/s with vehicle/ s to address the complaints/ accidents on SOS basis and take action immediately.</p> <p>o) The Manpower, spares, tools and accessories required for O&M shall be provided by CONTRACTOR during relevant contract period. Minimum One electrical technician with 8 years' experience and one assistant shall be provided for every 1200 luminaires since the beginning of the contract and shall be augmented if found insufficient during the course of the contract. Replacement for the teams shall be well planned during the scheduled offs and leaves.</p> <p>p) Arranging period inspection from Electrical inspectorate / Kerala State Electricity Board.</p> <p>q) Checking periodic earth resistance, calibration of all meters and maintenance of all system under the scope of implementation.</p> <p>r) If the bidder has not achieved 98% of the Illumination of total light, penalty is applicable as per the terms & conditions of contract.</p>
21.	50	2. SCOPE OF WORK AND TERMS OF REFERENCE	2.8.18 GPS mapping and tagging	2.8.18 GPS mapping of poles and light fixtures, CCMS panels shall be done for all underground cables and other major equipments.

Cochin Smart Mission Limited (CSML)

		2.8 Scope of work 2.8.18 GPS mapping and tagging																						
22.	121	3. GENERAL CONDITIONS OF CONTRACT 11. CONTRACT PRICE AND PAYMENT 11.3.5 Payment schedule	<p>The standard payment terms subject to recoveries, if any, by way of Liquidated Damages will be as under: -</p> <p>Payment terms:</p> <table border="1"> <thead> <tr> <th>Item Type</th> <th>Sl.No</th> <th>Break up of payment</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Major Electrical works/ Items like LED luminaire , cables, CCMS panels, Computer server etc.</td> <td>1</td> <td>After supply of material to site & submission of third party inspection certificates & acceptance.</td> <td>50 %</td> </tr> <tr> <td></td> <td>2</td> <td>After installing as per tender specification.</td> <td>20%</td> </tr> <tr> <td></td> <td>3</td> <td>Testing and commissioning of installed work On successful completion and commissioning of the system in section.</td> <td>15 %</td> </tr> <tr> <td></td> <td>4</td> <td>Final Handing over</td> <td>5%</td> </tr> </tbody> </table>	Item Type	Sl.No	Break up of payment	Percentage	Major Electrical works/ Items like LED luminaire , cables, CCMS panels, Computer server etc.	1	After supply of material to site & submission of third party inspection certificates & acceptance.	50 %		2	After installing as per tender specification.	20%		3	Testing and commissioning of installed work On successful completion and commissioning of the system in section.	15 %		4	Final Handing over	5%	<p>The schedule of payments shall be as included in the Contract. If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 28 Days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works. The percentage quoted in the Bid and accepted in the Contract will be deducted / added from/to the gross amount of the bill.</p>
Item Type	Sl.No	Break up of payment	Percentage																					
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	4	Final Handing over	5%																					

Cochin Smart Mission Limited (CSML)

				5	On Successful Completion of DLP	10%
		Dismantling work		1	Dismantling at site & depositing the same at stores	95 %
				2	Final Handing over	5 %
		Dismantling & Re-Installation		1	Dismantling & installation at site	70%
				2	Testing and commissioning of installed work	25%
				3	Final Handing over	5 %
		Supply and erection of poles		1	After supply of material to site & submission of third-party inspection certificates & acceptance.	50 %
				2	After installing as per tender specification.	35%
				3	Final Handing over	5 %
				4	On Successful Completion of DLP	10%

Cochin Smart Mission Limited (CSML)

23.	171	3.1 3A-Section Special Conditions (SC) Quality Control & Inspection	Quality Control & Inspection	7.4	<p>Add at the end of sub clause 7.4</p> <p>Quality Control would be monitored and checked by KMRL (Kochi Metro Rail Limited (Handholding agency for CSML) / CSML</p> <p>In addition to the specifications detailed in Section IV, KMRL rules of execution shall be followed by the Contractor.</p> <p>Quality Checking Matrix is as follows</p> <p>CONTRACTOR</p> <p>↓</p> <p>PMC (PROJECT MANAGEMENT CONSULTANTS)</p> <p>↓</p> <p>CSML(AUTHORITY)</p> <p>↓</p> <p>KMRL (HAND HOLDING AGENCY)</p>	Quality Control & Inspection	7.4	<p>Add at the end of sub clause 7.4</p> <p>Quality Control would be monitored and checked by PMC/ KMRL (Kochi Metro Rail Limited (Owner’s engineer CSML) / CSML</p> <p>In addition to the specifications detailed in Section IV, PMC/KMRL rules of execution shall be followed by the Contractor.</p> <p>Quality Checking Matrix is as follows</p> <p>CONTRACTOR</p> <p>↓</p> <p>PMC (PROJECT MANAGEMENT CONSULTANTS)</p> <p>↓</p> <p>KMRL (OWNER’S ENGINEER)</p> <p>OR/AND</p> <p>CSML(AUTHORITY)</p>
24.	172	3.1 3A-Section Special Conditions (SC)	Performance Security Amount	4.2	The performance security will be in the form of “a Unconditional Bank Guarantee” issued by a bank	Performance Security Amount	4.2	The performance security will be in the form of “an Unconditional Bank Guarantee” issued by a bank located in the country of the

Cochin Smart Mission Limited (CSML)

		<p>Performance Security Amount</p>		<p>located in the country of the Purchaser (Scheduled Bank in India with Jurisdiction in Kochi)</p> <p>Bank Guarantee submitted against the performance guarantee, shall be unconditional and encashable / invokable at Kochi when presented in specified Branch Office.</p> <p>The amount(s) of performance security shall be 10 percent of the Accepted Contract Amount and in the <i>currency of the country i.e. INR (Indian Rupees)</i>.</p> <p>The performance security of a JVA shall be in the name of the JVA that submits the bid.</p> <p>The Contractor shall ensure that the Performance Security including additional performance security amount is valid and enforceable until the Contractor has executed and</p>		<p>Purchaser (Scheduled Bank in India with Jurisdiction in Kochi)</p> <p>Bank Guarantee submitted against the performance guarantee, shall be unconditional and en-cashable / invokable at Kochi when presented in specified Branch Office.</p> <p>The amount(s) of performance security shall be 10 percent of the Accepted Contract Amount and in the <i>currency of the country i.e. INR (Indian Rupees)</i>.</p> <p>The performance security of a JVA shall be in the name of the JVA that submits the bid.</p> <p>The Contractor shall ensure that the Performance Security including additional performance security amount is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects.</p> <p>Performance Security including additional performance security will be refunded after expiry of</p>
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Cochin Smart Mission Limited (CSML)

					<p>completed the Works and remedied any defects.</p> <p>Performance Security including additional performance security will be refunded after expiry of defect liability period (original 1.5 years and extended if any) and three months provided the final bill has been paid and completion of all obligations under the Contract</p> <p>However, duly considering the performance of the Contractor, the Employer will return the additional Performance Security to the Contractor after receipt of a copy of the work completion (excluding defects liability) certificate from the Engineer with due recommendation for release of additional Performance Security.</p>		<p>O&M period (The O&M period starts after the successful commissioning of entire project in all respects) plus Sixty days provided the final bill has been paid and completion of all obligations under the Contract.</p> <p>However, duly considering the performance of the Contractor, the Employer will return the additional Performance Security to the Contractor after receipt of a copy of the work completion (excluding defects liability) certificate from the Engineer with due recommendation for release of additional Performance Security.</p>
25.	179 & 183	3.1 3A-Section Special Conditions	Payment terms	11.6	As per “Table 3 : Payment Terms” below	Table: 3 Is revised and furnished as Annexure 1 to this corrigendum	

Cochin Smart Mission Limited (CSML)

		(SC) Payment Terms		
26.	189	4. TECHNICAL SPECIFICATIONS 4.5 SMART ROAD AREA:	<p>The details of smart roads in ABD area is given below. In the smart road area, the existing lights will be replaced with decorative type GI poles and Dimmable type LED type street lights with individual light control. The height of the proposed lights poles is 7 meter and spacing between light poles is about 26 meters. The lights pole with double arm bracket is provided in median for the three roads such as Shanmugham roads and Banerji Road. For other smart roads, LED lights with single arm bracket is provided on both sides of the roads. For Shanmugham Road, if lighting levels are not able to achieve through median lights, additional lights of street light poles with single arm bracket / post top lantern can be provided. The height of light poles in median as well as in the sides of shall be made uniform for each road the number of CCMS panel can be considered as one number for one KM of road. All the light fixtures shall be with multiple dimming facility dimmable drivers with individual control. The lumen level LED fixture is planned in the smart road area is mentioned in the BOQ. The required lumens of each lamp, tilt angle, uniformity are given in the excel sheet. The bidder can select a</p>	<p>The details of smart roads in ABD area is given below. In the smart road area, the existing lights will be replaced with decorative type GI poles and Dimmable type LED type street lights with individual light control. The height of the proposed lights poles shall be in the range of 7/7.5meter and spacing between light poles is given in the detailed specification of roads. The height of light poles in median as well as in the sides of shall be made uniform for each road the number of CCMS panel can be considered as one number for one KM of road. All the light fixtures shall be with dimnable drivers having multiple dimming facility with individual control. The lumen level LED fixture is planned in the smart road area is mentioned in the BOQ. The bidder is free to propose light fixture with lumens specified in the BOQ and ensure the lighting level prescribed in the RFP.</p> <p>Table 4.6: Details of Smart Roads</p> <p>List of Smart Roads - Phase I</p>

Cochin Smart Mission Limited (CSML)

			<p>light fixture with lumens specified in the BOQ and ensure the lighting level prescribed in the RFP is achieved with offered light fixture.</p> <p>Table 4.6: Details of Smart Roads</p> <p>List of Smart Roads - Phase I</p> <table border="1" data-bbox="653 537 1255 1252"> <thead> <tr> <th colspan="3">SMART ROADS</th> </tr> <tr> <th>Road No.</th> <th>Road Name</th> <th>Length (Km)</th> </tr> </thead> <tbody> <tr><td>1</td><td>Durbar Hall Road</td><td>0.534</td></tr> <tr><td>2</td><td>Park Avenue Road</td><td>1.179</td></tr> <tr><td>3</td><td>Park Avenue Link Road</td><td>0.292</td></tr> <tr><td>4</td><td>Shanmugham Road</td><td>0.891</td></tr> <tr><td>5</td><td>Abraham Madammakal Road</td><td>1.112</td></tr> <tr><td>6</td><td>Banerji Road</td><td>0.905</td></tr> <tr><td>7</td><td>K B Jacob Road</td><td>1.084</td></tr> <tr><td>8</td><td>Amaravathi Road/ T M Muhammad Road</td><td>1.086</td></tr> <tr><td>9</td><td>River Road</td><td>0.150</td></tr> <tr><td>10</td><td>Bellar Road</td><td>0.280</td></tr> <tr><td>11</td><td>Kalvathy Road</td><td>0.640</td></tr> <tr><td></td><td>Total</td><td>8.153</td></tr> </tbody> </table>	SMART ROADS			Road No.	Road Name	Length (Km)	1	Durbar Hall Road	0.534	2	Park Avenue Road	1.179	3	Park Avenue Link Road	0.292	4	Shanmugham Road	0.891	5	Abraham Madammakal Road	1.112	6	Banerji Road	0.905	7	K B Jacob Road	1.084	8	Amaravathi Road/ T M Muhammad Road	1.086	9	River Road	0.150	10	Bellar Road	0.280	11	Kalvathy Road	0.640		Total	8.153	<table border="1" data-bbox="1289 250 1948 971"> <thead> <tr> <th colspan="3">SMART ROADS</th> </tr> <tr> <th>Road No.</th> <th>Road Name</th> <th>Length (Km)</th> </tr> </thead> <tbody> <tr><td>1</td><td>Durbar Hall Road</td><td>0.534</td></tr> <tr><td>2</td><td>Park Avenue Road</td><td>1.179</td></tr> <tr><td>3</td><td>Park Avenue Link Road</td><td>0.292</td></tr> <tr><td>4</td><td>Shanmugham Road</td><td>0.891</td></tr> <tr><td>5</td><td>Abraham Madammakal Road</td><td>1.112</td></tr> <tr><td>6</td><td>Banerji Road</td><td>0.905</td></tr> <tr><td>7</td><td>K B Jacob Road</td><td>1.084</td></tr> <tr><td>8</td><td>Amaravathi Road/ T M Muhammad Road</td><td>1.086</td></tr> <tr><td>9</td><td>River Road</td><td>0.150</td></tr> <tr><td>10</td><td>Bellar Road</td><td>0.280</td></tr> <tr><td>11</td><td>Kalvathy Road</td><td>0.640</td></tr> <tr><td></td><td>Total</td><td>8.153</td></tr> </tbody> </table> <p>Note: Other Roads and area included</p> <ol style="list-style-type: none"> 1. Jose Junction to South Railway Station Road is also included in the revised RFP. 2. Illumination of Mahatma Gandhi Statue in DH Road 	SMART ROADS			Road No.	Road Name	Length (Km)	1	Durbar Hall Road	0.534	2	Park Avenue Road	1.179	3	Park Avenue Link Road	0.292	4	Shanmugham Road	0.891	5	Abraham Madammakal Road	1.112	6	Banerji Road	0.905	7	K B Jacob Road	1.084	8	Amaravathi Road/ T M Muhammad Road	1.086	9	River Road	0.150	10	Bellar Road	0.280	11	Kalvathy Road	0.640		Total	8.153
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27.	190	4. TECHNICAL SPECIFICATIONS	4.7 STREET LIGHTING MANAGEMENT SYSTEM (SLMS)	<p>4.7 STREET LIGHTING MANAGEMENT SYSTEM (SLMS) FOR SMART LED</p> <p>For additional requirements of SLMS are furnished as</p>																																																																																				

Cochin Smart Mission Limited (CSML)

		4.7 STREET LIGHTING MANAGEMENT SYSTEM (SLMS)		Annexure 2 of this Corrigendum.
28.	195	4. TECHNICAL SPECIFICATIONS 4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL 4.8.1 FEATURES FOR SMART INDIVIDUAL CONTROL	<ul style="list-style-type: none"> • Each LED Street light shall have individual communication node with plug and play installation. • Smart LED Street light shall be able to operate at any weather condition. • Smart LED Street light shall have two-way communication. • In case of alert auto notification shall be forwarded directly to concerned area maintenance supervisor/staff. • The system shall be open source to integrate with 3rd party and smart city digital platform. • The communication node having self-protection from short circuit, over voltage and antitheft alert. • The system has real time and 07 days data backup facility. • The communication node controller shall have embedded photo sensor, auto GPS, astronomical clock and real time measurement features of power factor, active power, frequency, current, voltage, cumulative KWh and number of lamp 	<ul style="list-style-type: none"> • Each LED Street light shall have individual communication node with plug and play installation. • Smart LED Street light shall be able to operate at any weather condition. • Smart LED Street light shall have two-way communication. • In case of alert auto notification shall be forwarded directly to concerned area maintenance supervisor/staff. • The system shall be open source to integrate with 3rd party and smart city digital platform. • The communication node having self-protection from short circuit, over voltage. • The system has real time and 07 days data backup facility. • The communication node controller shall have embedded photo sensor, astronomical clock and real time measurement features of power factor, active power, current, voltage, cumulative KWh and number of lamp burring hours. • The web hosting/operation management with software access with API for 5 years shall be

Cochin Smart Mission Limited (CSML)

			<p>burring hours.</p> <ul style="list-style-type: none"> The web hosting/operation management with software access with API for 5 years shall be provided. The software of the controller shall have HTTPS access over the internet. Strong password and 2 factor authentications for login to smart lighting management software. Multi-level user roles with difference access rights. Regular scheduled updates of the smart lighting management software at the frequency of 1 month or faster. 3rd party penetration tests and certificate for the last 3 years end to end application layer AES encryption. All data must be retrained by system provider for one year after the termination of contract. The locations of these light fittings shall be seen in GUI (Graphical User Interface) from Command Centre / Control centre. In case of light fitting failure, the notification shall be shown in GUI for the streetlight under this category 	<p>provided.</p> <ul style="list-style-type: none"> The software of the controller shall have HTTPS access over the internet. Strong password and 2 factor authentications for login to smart lighting management software. Multi-level user roles with difference access rights. Regular scheduled updates of the smart lighting management software at the frequency of 1 month or faster. 3rd party penetration tests and certificate for the last 3 years end to end application layer AES encryption. All data must be retrained by system provider for one year after the termination of contract. The locations of these light fittings shall be seen in GUI (Graphical User Interface) from Command Centre / Control centre. In case of light fitting failure, the notification shall be shown in GUI for the streetlight under this category 												
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Cochin Smart Mission Limited (CSML)

	INDIVIDUAL LIGHT POINT CONTROL	4.8.2 TYPE 1: (SHANMUGHAM ROAD)	2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip	2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.		
			10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder	10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder		
			12	System Efficacy (lumen/watt)	Shall be >105 lumen/watt	LM-79 report	12	System Efficacy (lumen/watt)	Shall be >115 lumen/watt or more	LM-79 report
			16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report	16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		
			18	LED Drive current	>=350 mA -1200 mA	18	LED Drive current	>=350 mA -600 mA		
			26	Protections	IP66 for all type of lamps to be installed Surge protection 4 kV, IEC61000-4-5	NABL accredited lab report	26	Protections	IP66 for all type of lamps to be installed Surge protection 6 kV , IEC61000-4-5	NABL accredited lab report

Cochin Smart Mission Limited (CSML)

30.	199	<p>4. TECHNICAL SPECIFICATIONS</p> <p>4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL</p> <p>4.8.2 TYPE 1: (SHANMUGHAM ROAD)</p>	<p>TECHNICAL SPECIFICATION FOR SMART LED DECORATIVE LIGHT TO BE USED IN SHANMUGHAM ROAD:</p> <table border="1"> <thead> <tr> <th data-bbox="642 380 730 509">S. No.</th> <th data-bbox="730 380 1010 509">Typical specifications of Smart LED decorative post top light</th> <th data-bbox="1010 380 1257 509">Supporting document</th> </tr> </thead> <tbody> <tr> <td data-bbox="642 509 730 716">2</td> <td data-bbox="730 509 1010 716">Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10</td> <td data-bbox="1010 509 1257 716">LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td data-bbox="642 716 730 834">10</td> <td data-bbox="730 716 1010 834">Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K</td> <td data-bbox="1010 716 1257 834">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td data-bbox="642 834 730 1008">12</td> <td data-bbox="730 834 1010 1008">System Efficacy (lumen/watt)</td> <td data-bbox="1010 834 1257 1008">Shall be >95 lumen/watt LM-79 report</td> </tr> <tr> <td data-bbox="642 1008 730 1096">18</td> <td data-bbox="730 1008 1010 1096">LED Drive current</td> <td data-bbox="1010 1008 1257 1096">>=350 mA -1200 mA</td> </tr> </tbody> </table>	S. No.	Typical specifications of Smart LED decorative post top light	Supporting document	2	Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10	LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip	10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder	12	System Efficacy (lumen/watt)	Shall be >95 lumen/watt LM-79 report	18	LED Drive current	>=350 mA -1200 mA	<p>TECHNICAL SPECIFICATION FOR SMART LED DECORATIVE LIGHT TO BE USED IN SHANMUGHAM ROAD:</p> <table border="1"> <thead> <tr> <th data-bbox="1287 347 1375 477">S. No.</th> <th data-bbox="1375 347 1667 477">Typical specifications of Smart LED decorative post top light</th> <th colspan="2" data-bbox="1667 347 1953 477">Supporting document</th> </tr> </thead> <tbody> <tr> <td data-bbox="1287 477 1375 623">2</td> <td data-bbox="1375 477 1667 623">Life span of LED used in the luminaire shall be more than 50,000 hours @80% light output</td> <td colspan="2" data-bbox="1667 477 1953 623">LM-80/IS16105, L80 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td data-bbox="1287 623 1375 742">10</td> <td data-bbox="1375 623 1667 742">Colour temperature of the luminaire shall be in the range of nominal 4000K</td> <td colspan="2" data-bbox="1667 623 1953 742">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td data-bbox="1287 742 1375 888">12</td> <td data-bbox="1375 742 1667 888">System Efficacy (lumen/watt)</td> <td data-bbox="1667 742 1808 888">Shall be >100 lumen/watt or more</td> <td data-bbox="1808 742 1953 888">LM-79 report</td> </tr> <tr> <td data-bbox="1287 888 1375 948">18</td> <td data-bbox="1375 888 1667 948">LED Drive current</td> <td colspan="2" data-bbox="1667 888 1953 948">>=350 mA -900 mA</td> </tr> </tbody> </table>	S. No.	Typical specifications of Smart LED decorative post top light	Supporting document		2	Life span of LED used in the luminaire shall be more than 50,000 hours @80% light output	LM-80/IS16105, L80 & TM 21 Test Report test report including technical data sheet of LED Chip		10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder		12	System Efficacy (lumen/watt)	Shall be >100 lumen/watt or more	LM-79 report	18	LED Drive current	>=350 mA -900 mA	
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CONTROL	4.8.3 TYPE 2: (BANERJI ROAD)			including technical data sheet of LED Chip		10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder			
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Cochin Smart Mission Limited (CSML)

32.	206	<p>4. TECHNICAL SPECIFICATIONS</p> <p>4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL</p> <p>4.8.3 TYPE 2: (BANERJI ROAD)</p>	<p>TECHNICAL SPECIFICATION FOR SMART STREET LED DECORATIVE POST TOP LIGHT TO BE USED IN BANERJI ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th>Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10</td> <td>LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td>4</td> <td>Wattage: suitable wattage with system lumens: > 28350000 lumens</td> <td>LM 79 Report</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K</td> <td>LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >95 lumen/watt</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td>>=350 mA -1200 mA</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document	2	Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10	LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip	4	Wattage: suitable wattage with system lumens: > 28350000 lumens	LM 79 Report	10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder	12	System Efficacy (lumen/watt)	Shall be >95 lumen/watt	18	LED Drive current	>=350 mA -1200 mA	<p>TECHNICAL SPECIFICATION FOR SMART STREET LED DECORATIVE POST TOP LIGHT TO BE USED IN BANERJI ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th>Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LED used in the luminaire shall be more than 50,000 hours @80% light output</td> <td>LM-80/IS16105, L80 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td>4</td> <td>Wattage: suitable wattage with system lumens: > 3500 lumens</td> <td>LM 79 Report</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of 4000K</td> <td>LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >100 lumen/watt or more LM-79 report</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td>>=350 mA -600 mA</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document	2	Life span of LED used in the luminaire shall be more than 50,000 hours @80% light output	LM-80/IS16105, L80 & TM 21 Test Report test report including technical data sheet of LED Chip	4	Wattage: suitable wattage with system lumens: > 3500 lumens	LM 79 Report	10	Colour temperature of the luminaire shall be in the range of 4000K	LM-79 report for both type of LED's to be submitted by the bidder	12	System Efficacy (lumen/watt)	Shall be >100 lumen/watt or more LM-79 report	18	LED Drive current	>=350 mA -600 mA
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Cochin Smart Mission Limited (CSML)

34.	215	LIGHT POINT CONTROL 4.8.4 TYPE 3: (PARK AVENUE ROAD, KB JACOB ROAD, BELLAR ROAD, AMARAVATHI ROAD TO FORT KOCHI & CALVATHY ROAD, HOSPITAL ROAD, DARBAR HALL ROAD AND RAILWAYSTATION ROAD	2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip	2	2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.		
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			12	System Efficacy (lumen/watt)	Shall be >105 lumen/watt		LM-79 report	12	System Efficacy (lumen/watt)	Shall be >115 lumen/watt or more	LM-79 report
			16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		
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Cochin Smart Mission Limited (CSML)

		<p>SPECIFICATIONS</p> <p>4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL</p> <p>4.8.5 TYPE 4 (ABRAHAM MADAMAKKAL ROAD / ASHISH JUNCTION ROAD)</p>	<p>TECHNICAL SPECIFICATION FOR SMART STREETLIGHT TO BE USED IN ASHISH JUNCTION ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th colspan="2">Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output</td> <td colspan="2">LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K</td> <td colspan="2">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >105 lumen/watt</td> <td>LM-79 report</td> </tr> <tr> <td>16</td> <td>Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)</td> <td colspan="2">NABL accredited lab report</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td colspan="2">>=350 mA -1200 mA</td> </tr> <tr> <td>26</td> <td>Protections</td> <td>IP66 for all type of lamps to be installed</td> <td>NABL accredited lab report</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document		2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip		10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder		12	System Efficacy (lumen/watt)	Shall be >105 lumen/watt	LM-79 report	16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		18	LED Drive current	>=350 mA -1200 mA		26	Protections	IP66 for all type of lamps to be installed	NABL accredited lab report	<p>TECHNICAL SPECIFICATION FOR SMART STREETLIGHT TO BE USED IN ASHISH JUNCTION ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th colspan="2">Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output</td> <td colspan="2">LM-80 / IS16105, L90 Test Report test report including technical data sheet.</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of nominal 4000K</td> <td colspan="2">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >115 lumen/watt or more</td> <td>LM-79 report</td> </tr> <tr> <td>16</td> <td>Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)</td> <td colspan="2">NABL accredited lab report</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td colspan="2">>=350 mA -600 mA</td> </tr> <tr> <td>26</td> <td>Protections</td> <td>IP66 for all type of lamps to be installed Surge protection 6 kV, IEC61000-4-5</td> <td>NABL accredited lab report</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document		2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.		10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder		12	System Efficacy (lumen/watt)	Shall be >115 lumen/watt or more	LM-79 report	16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		18	LED Drive current	>=350 mA -600 mA		26	Protections	IP66 for all type of lamps to be installed Surge protection 6 kV , IEC61000-4-5	NABL accredited lab report
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Cochin Smart Mission Limited (CSML)

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Cochin Smart Mission Limited (CSML)

4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL 4.8.6 TYPE 5: HIGH COURT ROAD		of Smart LED street lights	document		N o.	of Smart LED street lights		
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Cochin Smart Mission Limited (CSML)

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Cochin Smart Mission Limited (CSML)

INDIVIDUAL LIGHT POINT CONTROL	4.8.7 TYPE 6: BRIDGE ROAD	2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip		2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.	
		10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder		10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder	
		12	System Efficacy (lumen/watt)	Shall be >105 lumen/watt	LM-79 report	12	System Efficacy (lumen/watt)	Shall be >115 lumen/watt or more	LM-79 report
		16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report		16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report	
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Cochin Smart Mission Limited (CSML)

39.	229	<p>4. TECHNICAL SPECIFICATIONS</p> <p>4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL</p> <p>4.8.7 TYPE 6: BRIDGE ROAD</p>	<p>TECHNICAL SPECIFICATION FOR SMART LED DECORATIVE POST TOP LIGHT TO BE USED IN BRIDGE ROAD:</p> <table border="1"> <thead> <tr> <th data-bbox="640 410 730 511">S. No.</th> <th data-bbox="730 410 1010 511">Typical specifications of Smart LED street lights</th> <th colspan="2" data-bbox="1010 410 1255 511">Supporting document</th> </tr> </thead> <tbody> <tr> <td data-bbox="640 511 730 716">2</td> <td data-bbox="730 511 1010 716">Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10</td> <td colspan="2" data-bbox="1010 511 1255 716">LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td data-bbox="640 716 730 906">10</td> <td data-bbox="730 716 1010 906">Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K</td> <td colspan="2" data-bbox="1010 716 1255 906">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td data-bbox="640 906 730 1079">12</td> <td data-bbox="730 906 1010 1079">System Efficacy (lumen/watt)</td> <td data-bbox="1010 906 1136 1079">Shall be >95 lumen/watt</td> <td data-bbox="1136 906 1255 1079">LM-79 report</td> </tr> <tr> <td data-bbox="640 1079 730 1247">18</td> <td data-bbox="730 1079 1010 1247">LED Drive current</td> <td data-bbox="1010 1079 1136 1247">>=350 mA - 1200 mA</td> <td data-bbox="1136 1079 1255 1247">LM-79 report</td> </tr> </tbody> </table>	S. No.	Typical specifications of Smart LED street lights	Supporting document		2	Life span of LEDs used in the Luminaire shall be more than 100000 hours at Useful life L80B10	LM-80/IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip		10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder		12	System Efficacy (lumen/watt)	Shall be >95 lumen/watt	LM-79 report	18	LED Drive current	>=350 mA - 1200 mA	LM-79 report	<p>TECHNICAL SPECIFICATION FOR SMART LED DECORATIVE POST TOP LIGHT TO BE USED IN BRIDGE ROAD:</p> <table border="1"> <thead> <tr> <th data-bbox="1285 378 1375 479">S. No.</th> <th data-bbox="1375 378 1669 479">Typical specifications of Smart LED street lights</th> <th colspan="2" data-bbox="1669 378 1955 479">Supporting document</th> </tr> </thead> <tbody> <tr> <td data-bbox="1285 479 1375 597">2</td> <td data-bbox="1375 479 1669 597">Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output</td> <td colspan="2" data-bbox="1669 479 1955 597">LM-80 / IS16105, L90 Test Report test report including technical data sheet.</td> </tr> <tr> <td data-bbox="1285 597 1375 716">10</td> <td data-bbox="1375 597 1669 716">Colour temperature of the luminaire shall be in the range of nominal 4000K</td> <td colspan="2" data-bbox="1669 597 1955 716">LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td data-bbox="1285 716 1375 862">12</td> <td data-bbox="1375 716 1669 862">System Efficacy (lumen/watt)</td> <td data-bbox="1669 716 1808 862">Shall be >100 lumen/watt or more</td> <td data-bbox="1808 716 1955 862">LM-79 report</td> </tr> <tr> <td data-bbox="1285 862 1375 992">18</td> <td data-bbox="1375 862 1669 992">LED Drive current</td> <td data-bbox="1669 862 1808 992">>=350 mA - 600 mA</td> <td data-bbox="1808 862 1955 992"></td> </tr> </tbody> </table>	S. No.	Typical specifications of Smart LED street lights	Supporting document		2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.		10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder		12	System Efficacy (lumen/watt)	Shall be >100 lumen/watt or more	LM-79 report	18	LED Drive current	>=350 mA - 600 mA	
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4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL 4.8.8 TYPE 7: NORMAL ROADS	S.No.	Typical specifications of Smart LED street lights	Supporting document		S.No.	Typical specifications of Smart LED street lights	Supporting document	
	2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip		2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.	
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Cochin Smart Mission Limited (CSML)

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42.	240	<p>4. TECHNICAL SPECIFICATIONS</p>	<p>TECHNICAL SPECIFICATION FOR STREETLIGHT TO BE USED IN A1 CATEGORY ROAD:</p>		<p>TECHNICAL SPECIFICATION FOR STREETLIGHT TO BE USED IN A1 CATEGORY ROAD:</p>																																

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4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL 4.8.9 A1 TYPE ROADS	S.No.	Typical specifications of Smart LED street lights	Supporting document		S.No.	Typical specifications of Smart LED street lights	Supporting document	
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Cochin Smart Mission Limited (CSML)

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43.	243	4. TECHNICAL SPECIFICATIONS 4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL	4.6.6 A2 TYPE ROADS		Please read as 4.8.9.1 A2 TYPE ROADS																										
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Cochin Smart Mission Limited (CSML)

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			18	LED Drive current	>=350 mA -1200 mA	LM-79 report				
			23	The luminaire shall be built in such a way that it can withstand wind speed of 150 kmph. (Impact resistance>=IK05)	NABL accredited lab report					
			26	Protections	IP66 for all type of lamps to be installed Surge protection 4 kV, IEC61000-4-5	NABL accredited lab report				
			The bidder shall to ensure the required lighting parameters are met. Refer TCS drawing Fig.11 & Fig 12 for typical cross section of the road:							
			12	System Efficacy (lumen/watt)	Shall be >120 lumen/watt or more	LM-79 report				
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			<ol style="list-style-type: none"> 1. Single carriage way road width of: 1) 12m (fig 19) and 2) 10m (fig 20) 2. Arrangement: 1) suitable wattage LED streetlight with system lumens > 6800 lumens staggered arrangement and 2) suitable wattage LED streetlight with system lumens > 6800 lumens LED streetlight with single sided arrangement respectively 3. Overhang: max 1.5m 4. Tilt angle: Max 15 degree 5. Pole to pole distance: 1) 25m (on one side) and 2) 26m respectively 6. Required avg lux level: ≥ 15 lux at road 7. E_{min} / E_{avg}: ≥ 0.4 at road 8. E_{min} / E_{max}: ≥ 0.33 at road 9. UI (Uniformity lengthwise): ≥ 0.7 at road 10. Threshold Increment (TI %): < 18% at road 11. Maintenance Factor to be considered: 0.85 12. Grid points: Road: 1) 10 x 8 points and 2) 10 x 7 points respectively 13. Road reflection: tarmac: R3, q0: 0.07 14. Lighting level measurement will be conducted considering these parameters. 	<ol style="list-style-type: none"> 1. Single carriage way road width of 1) 12m (fig 19) and 2) 10m (fig 20) <p>Arrangement: 1) suitable wattage LED streetlight with system lumens > 6800 lumens staggered arrangement and 2) suitable wattage LED streetlight with system lumens > 6800 lumens LED streetlight with single sided arrangement respectively. Nominal system Wattage: Suitable Wattage with Nominal system lumens: > 6800 lumens, & >3500 lumens for 11 to 12 mtr. roads. >6800 lumens for 8 to 10 mtr. road</p> <ol style="list-style-type: none"> 1. Overhang: max 1.5m 2. Tilt angle: Max 15 degree 3. Pole to pole distance: 1) 25m (on one side) and 2) 26m respectively 4. Required avg lux level: ≥ 15 lux at road 5. E_{min} / E_{avg}: ≥ 0.4 at road 6. E_{min} / E_{max}: ≥ 0.33 at road 7. UI (Uniformity lengthwise): ≥ 0.9 at road 8. Threshold Increment (TI %): < 20% at road 9. Maintenance Factor to be considered: 0.85 10. Grid points: Road: 1) 10 x 8 points and 2) 10 x 7 points respectively 11. Road reflection: tarmac: R3, q0: 0.07 12. Lighting level measurement will be conducted considering these parameters.
45.	249	4. TECHNICAL		

Cochin Smart Mission Limited (CSML)

	<p>SPECIFICATIONS</p> <p>4.8 SMART ROADS – INDIVIDUAL LIGHT POINT CONTROL</p> <p>4.8.10 B1 TYPE ROADS</p>	<p>TECHNICAL SPECIFICATION FOR STREETLIGHT TO BE USED IN B1 CATEGORY ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th>Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output</td> <td>LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip</td> </tr> <tr> <td>4</td> <td>Nominal sys Wattage: suitable Wattage with nominal system lumens: > 3500 lumens</td> <td>LM-79 report</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K</td> <td>LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >105 lumen/watt LM-79 report</td> </tr> <tr> <td>16</td> <td>Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)</td> <td>NABL accredited lab report</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td>>=350 mA -1200 mA LM-79 report</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document	2	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output	LM-80 / IS16105,L70 & TM 21 Test Report test report including technical data sheet of LED Chip	4	Nominal sys Wattage: suitable Wattage with nominal system lumens: > 3500 lumens	LM-79 report	10	Colour temperature of the luminaire shall be in the range of nominal 4000K to 5500K	LM-79 report for both type of LED's to be submitted by the bidder	12	System Efficacy (lumen/watt)	Shall be >105 lumen/watt LM-79 report	16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 4 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report	18	LED Drive current	>=350 mA -1200 mA LM-79 report	<p>TECHNICAL SPECIFICATION FOR STREETLIGHT TO BE USED IN B1 CATEGORY ROAD:</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Typical specifications of Smart LED street lights</th> <th>Supporting document</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output</td> <td>LM-80 / IS16105, L90 Test Report test report including technical data sheet.</td> </tr> <tr> <td>4</td> <td>Nominal system Wattage: suitable Wattage with nominal system lumens: > 3500 lumens</td> <td>LM-79 report</td> </tr> <tr> <td>10</td> <td>Colour temperature of the luminaire shall be in the range of nominal 4000K</td> <td>LM-79 report for both type of LED's to be submitted by the bidder</td> </tr> <tr> <td>12</td> <td>System Efficacy (lumen/watt)</td> <td>Shall be >120-lumen/watt or more LM-79 report</td> </tr> <tr> <td>16</td> <td>Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)</td> <td>NABL accredited lab report</td> </tr> <tr> <td>18</td> <td>LED Drive current</td> <td>>=350 mA - 900 mA</td> </tr> <tr> <td>23</td> <td>The luminaire shall be built in such a way that it can withstand wind</td> <td>NABL accredited lab report</td> </tr> </tbody> </table>	S.No.	Typical specifications of Smart LED street lights	Supporting document	2	Life span of LED used in the luminaire shall be more than 50,000 hours @90% light output	LM-80 / IS16105, L90 Test Report test report including technical data sheet.	4	Nominal system Wattage: suitable Wattage with nominal system lumens: > 3500 lumens	LM-79 report	10	Colour temperature of the luminaire shall be in the range of nominal 4000K	LM-79 report for both type of LED's to be submitted by the bidder	12	System Efficacy (lumen/watt)	Shall be >120-lumen/watt or more LM-79 report	16	Operating voltage: 140 V to 270V universal electronic driver with internal surge protection of 6 KV (Applicability IS 15885, Driver Safety 16104-1/2)	NABL accredited lab report	18	LED Drive current	>=350 mA - 900 mA	23	The luminaire shall be built in such a way that it can withstand wind	NABL accredited lab report
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Cochin Smart Mission Limited (CSML)

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Cochin Smart Mission Limited (CSML)

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Cochin Smart Mission Limited (CSML)

47.	268	5.SPECIFICATIO N OF MATERIALS 5.2 CCMS AND ILM PANEL 5.2.1 TECHNICAL SPECIFICATION	2) Enclosure should be made of fire-retardant FRS/ SMC material and with impact resistance of IK10.	2) Enclosure should be made of fire-retardant FRS/ SMC material and with impact resistance of IK-08.
48.	270	5. SPECIFICATION OF MATERIALS 5.2 CCMS AND ILM PANEL 5.2.1 TECHNICAL SPECIFICATION	20) Following tampers are logged with occurrence and restoration in FIFO •Low Load •Over load •Low Power Factor •Under voltage •Overvoltage • Magnet	The item magnet is deleted.
49.	278	5 SPECIFICAT IONS OF MATERIALS 5.3 STREET LIGHT CONTROLLER 5.3.2 GENERAL SPECIFICATIO NS	31. The street light Feeder Pillar shall be provided with: a. Incomer MCCB of 63 Amps, 16 KA, 4 pole with thermal magnetic release – 1 No. b. Outgoing MCCB of 16/25 Amps, 16 KA, 4 pole with thermal magnetic release – 5 Nos. c. Power Contactor of 95 Amp, 3 Pole -1 No d. Voltmeter 0-500 V, 96 sq mm flush type with selector switch – 1 No. e. Ammeter 0-100 A, 96 sq mm flush type with selector switch -1 No.	31. The street light Feeder Pillar shall be provided with: a. Incomer MCCB of 63 Amps, 16 KA, 4 pole with thermal magnetic release – 1 No. b. Outgoing MCCB of 16/25 Amps, 16 KA, 4 pole with thermal magnetic release – 5 Nos. c. Power Contactor of 100 Amp , 3 Pole -1 No d. Voltmeter 0-500 V, 96 sq mm flush type with selector switch – 1 No. e. Ammeter 0-100 A, 96 sq mm flush type with selector switch -1 No.

Cochin Smart Mission Limited (CSML)

			<p>f. LED indicator lamps (RYB) with HRC control fuse with fuse fitting – 3 Nos.</p> <p>g. Astro-timer Rex Modular D-21 model (Legrand or equivalent)</p> <p>h. Push Button</p> <p>i. Danger plate</p>	<p>f. LED indicator lamps (RYB) with HRC control fuse with fuse fitting – 3 Nos.</p> <p>g. Astro-timer Rex Modular D-21 model (Legrand or equivalent)</p> <p>h. Push Button</p> <p>i. Danger plate</p>
50.	286	<p>5 SPECIFICATIONS OF MATERIALS</p> <p>5.3 STREET LIGHT CONTROLLER</p> <p>5.3.3 COMPONENTS OF FEEDER PANEL</p>	<p>5.3.3.23 VOLTAGE CONTROLLERS</p>	<p>This Clause stands Deleted.</p>
51.	291	<p>5. SPECIFICATIONS OF MATERIALS</p> <p>5.3 STREET LIGHT CONTROLLER</p> <p>5.3.10 INDIVIDUAL LIGHT POINT</p>	<p>b) There shall be no requirement to carry out survey to establish the communication network or to find out best location for segment controller/ gateway as the proposed system shall have independent M2M communication from each luminaire to server over GPRS/GSM & hence not relying on one others to build up mesh of communication, thereby avoiding any further interference, loss of signal & thereby leading to fast deployment of installation program.</p>	<p>(b) The communication system used for the communication from each luminaire to the control system shall be state of the art which can ensure an availability of 99% or more. Necessary redundancy shall be considered in the system architecture to ensure the system availability.</p> <p>d) Bidder shall ensure that the proposed communication system will be protected from EMI from other communication system or smart devices in the vicinity.</p>

Cochin Smart Mission Limited (CSML)

		CONTROL SYSTEM	<p>d) The individual light point control shall use a license network from server all the way up to luminaire & node controller & shall not require setting up any proprietary network, gateways/data boosters & infrastructure thereby making system fully interference free from other communication system & or smart devices.</p> <p>e) The “Intelligent Luminaire” shall incorporate GPS positioning (at least CEP50 \leq2.5m/ 8 ft) that identifies the device geo-location and the device data is automatically uploaded to the back-end, with the luminaire / light point / asset then graphically displayed in the user interface.</p> <p>n) The CMS node will be mounted to the top of the luminaire housing via a 20mm hole or appropriate external socket/bracket and meet the same ingress protection (IP66), and impact resistance (IK09) rating as required of the luminaire.</p> <p>x) The system hardware shall be fully compliant with all relevant European standards and EC Directives as required to demonstrate full compliance with the CE Directive and be clearly marked accordingly supporting evidence shall be provided with the tender.</p>	<p>e) Auto GPS system for the luminaire is optional.</p> <p>n) The CMS node will be mounted to the top of the luminaire housing using NEMA socket or appropriate external socket/bracket and meet the same ingress protection (IP66), and impact resistance (IK08) rating as required of the luminaire. Alternatively the Node can be mounted on the pole without impacting the aesthetic of the pole. The colour, shape, mounting arrangement etc of the node shall be customized to match the design of the pole. The wiring from the node to the luminaire shall be consealed and protected from any mechanical damage and Electro Magnetic Interference (EMI).</p> <p>x) The system hardware shall be fully compliant with relevant European standards, IEC. Indian Standards as applicable.</p>
52.	297	5 SPECIFICAT	5.5.1 BASIC REQUIREMENT	The Smart Energy meter shall be installed inside

Cochin Smart Mission Limited (CSML)

		<p>IONS OF MATERIALS</p> <p>5.5 SMART ENERGY METER</p> <p>5.5.1 BASIC REQUIREMENT</p>	<p>The Smart Energy meter installed at the CCMS panel shall conform to IS 16444 standards. The energy meter shall have the provision for external communication by using RS 232 port of IRDA for communication to a hand-held unit or AMR. Energy meter capable of detecting and recording anti tamper features including neutral missing and abnormal voltage/ frequency protection. The meter shall be from approved make of Kerala State Electricity Boards (KSEB). All the approvals, testing and installation shall be as per the guidelines of KSEB.</p>	<p>the feeder pillar cum CCMS panel. The meter shall be integrated to the existing smart Metering system of KSEB. The specification shall be as per the smart meter specifications of Kerala State electricity board. The energy meter shall be tested at KSEB approved testing laboratories before installation. The following points also to be considered.</p> <ul style="list-style-type: none"> • Open protocol (DLMS) Device Language Message specification, a generalized concept for abstract modeling of communication entities, used for meter communication • Integrated communication module Configurable for GSM-GPRS/Wi-Fi, IrDA/Bluetooth/LoRa • Remote firmware upgrades • Algorithms Contains algorithms for energy calculation and management, theft detection, data logging etc. Remote load connect / disconnect facility • Anti-tamper- Anti tamper and fraud detection will be done immediately • Security - Password protected user login and parameter settings <p>Typical SPECIFICATIONS –</p> <ul style="list-style-type: none"> • Three Phase, 4 wire (Three phase) direct connection • Standards: IS 16444, IS 15959(1), IS 15959(2)
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				<ul style="list-style-type: none"> • Metrology Accuracy: Class 1 • Rated Voltage: 240 V (-40% to +20%) Single Phase • Starting Current: 0.2% Ib\ • Frequency: 50 Hz +-5% • Load Contactor: Latching relays • Display: LCD • LED indicators: Line, Tamper, Export, kWh • Communication port/methods: GSM-GPRS/WiFi • Communication protocol: DLMS COSEM <p>The meter shall be from approved make of Kerala State Electricity Boards (KSEB). All the approvals, testing and installation shall be as per the guidelines of KSEB.</p>
53.	298	5 SPECIFICATIO NS OF MATERIALS 5.5 SMART ENERGY METER	5.5.2 ADVANTAGES, 5.5.3 RATING & 5.5.4 SYSTEM COMPONENTS	These Clauses stands deleted
54.	299	5 SPECIFICATIO NS OF MATERIALS 5.6 LIGHTING	LED LAMP AND LUMINAIRE The light source will be of white LED type and be compliant to IEC standards. Single lamp or multiple lamps can be used. The typical specifications for LED street lights are as follows: Table 5 5: Typical specifications for LED	This Clauses stands deleted

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		5.6.2 LED LAMPS AND LUMINAIRE:	street lighting	
55.	303	5 SPECIFICATIONS OF MATERIALS 5.7 SELECTION OF STREET LIGHT POLES	5.7.3 LIGHTING POLE DESIGN Fabricating, Supplying and erection of 7 meter long hot tip galvanized steel octagonal pole with BSEN 10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangements, including suitable boards, Bakelite sheet and MCBs as per IS specifications suitable to withstand 47 m/s for 7 meter pole in single section and single joint welded as per IS 9595/IS 10178 AWS having dimensions bottom 130 mm, top 70 mm with 3 mm thick, suitable base plate and 4 nos of M20 x700 mm long J bolts along with templates and the pole shall be hot dip galvanized in single dipping with not less than 70 microns as per ASTM of suitable length conforming to IS 2629/IS 2633/IS4759. The pole shall be in single piece (single hot dip galvanized) and shall tapered towards the top. The bottom section shall have open able slot with exterior surface door & shall have suitable locking arrangement for housing three phase 4 wire cable connection, Bakelite sheet, MCB, loop in and out arrangement for incoming/outgoing cables. There shall also be suitable	5.7.3 COMPOSITE LIGHTING POLE DESIGN Design, Fabrication, Supply and erection of 9/7-meter Hot Dip Galvanized Composite Octagonal Pole with other accessories suitable for mounting LED light and carrying 415 V, 3CX95 sq.mm + 1X70 sq.mm + 1X16 sq.mm) Aerial Bunch Cable and with following height and minimum 3 mm thickness with baseplate including cost of nuts, bolts and all accessories supplied by the manufacturer including cost of foundation accessories etc., stays where ever required. There should be a provision for connecting the AB cable, with suitable junction box for giving service connections, isolator and fuse carrier with connecting wires up to junction box on the Octagonal poles, 8-way connector and 2A MCB inside pole and 40 mm diameter GI pipe for each cable entry. The foundation bolts as per manufacturer's design should be hot dipped galvanized complete with door locking arrangement with sleeve type door for the cut-out compartment. Terminal plate consisting of 2nos. of 100 A, 4 pole neutral links including cost of RCC with M25

Cochin Smart Mission Limited (CSML)

			<p>arrangement for the purpose of earthing. Rigid Base plate of suitable size and thickness shall be welded inside and outside at the bottom of pole with provision for fixing 4 foundation bolts. The octagonal pole shall be bolted on a pre- cast foundation with a set of four foundation bolts for greater rigidity. The foundation shall be erected over cement concrete M20 of given size to fixed up to a required planting depth below ground level as required:-</p>	<p>grade concrete for foundation of size as per drawing and able to withstand AB cable load as well as wind load of 45 m/s. The rate is inclusive of fixing the pole with labour and material required to complete the job in all respect to the satisfaction of Engineer -in-charge. The design report of pole and stad report to be submitted along with the proposal. The design of pole has to be approved from KSEB before procurement.</p>
56.	307	<p>5 SPECIFICATIO NS OF MATERIALS</p> <p>5.7 SELECT ION OF STREET LIGHT POLES</p> <p>5.7.11.6 ADDITIONAL SPECIFICATIO NS:</p>	<p>5.7.11.6 ADDITIONAL SPECIFICATIONS:</p> <ol style="list-style-type: none"> 1) Thermal management of LED: Good thermal management system should be provided and LED must be mounting on heat sink conductive aluminum with suitable large areas surface by means of fins to dissipate the heat to ambient air. 2) Application Standard the fixture should confirm to applicable IEC 60598-1, IEC 61000-3-2 and IEC 61547. 3) Test Compliance for LED is LM 80 (IS-16105) and Test Compliance for Fixture is LM 79 (IS16106, IEC 60598/IS:10322). Successful tenderer shall submit test compliance at the time of delivery. However, the tenderer shall submit an undertaking for the same at the time of submission of the bid. 	<p>5.7.11.6 ADDITIONAL SPECIFICATIONS:</p> <ol style="list-style-type: none"> 1) Thermal management of LED: Good thermal management system should be provided, and LED must be mounting on heat sink conductive aluminum with suitable large areas surface by means of fins to dissipate the heat to ambient air. 2) Application Standard the fixture should confirm to applicable IEC 60598-1, IEC 61000-3-2 and IEC 61547. 3) Test Compliance for LED is LM 80 (IS-16105) and Test Compliance for Fixture is LM 79 (IS16106, IEC 60598/IS:10322). Successful tenderer shall submit test compliance at the time of delivery. However, the tenderer shall submit an undertaking for the same at the time of submission of the bid. 4) Power Management: programmable per

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			4) Power Management: programmable per application scenarios, dynamic light profile customer specific, run time extension and Remote monitoring options to be there for future upgrade	application scenarios, dynamic light profile customer specific, run time extension and Remote monitoring options to be there for future upgrade 5) Battery voltage is 12 volts												
57.	308	5 SPECIFICATIO NS OF MATERIALS 5.8 CONTRAC TOR'S REQUIRE MENT 5.8.6 SPARES	Recommended spares: The Tenderer shall furnish in his offer a list of recommended spares with unit rates for each set of equipment that may be necessary for satisfactory operation and maintenance of circuit breaker and Isolators for a period of 5 years. The purchaser reserves right of selection of items and quantities of these spares to be ordered. The cost of such spares shall not be considered for tender evaluation.	Recommended spares: The Tenderer shall furnish in his offer a list of recommended spares for each set of equipment that may be necessary for satisfactory operation. The Annual Maintenance charges is inclusive of cost of spares and other machineries												
58.	309	5 SPECIFICATIO NS OF MATERIALS 5.9 CONTRAC TOR'S REQUIRE MENT 5.8.9 LIST OF PREFERRED MANUFACTU RERS	Table 5-6: Preferred Equipment's Manufactures <table border="1" data-bbox="653 989 1234 1122"> <tr> <td>5</td> <td>Hot Dip Galvanized GI swaged tubular / octagonal poles</td> <td>Bajaj / Valmont / Sumip / Crompton, Surya / Philips / BPP.</td> </tr> </table>	5	Hot Dip Galvanized GI swaged tubular / octagonal poles	Bajaj / Valmont / Sumip / Crompton, Surya / Philips / BPP.	Table 5-6: Preferred Equipment's Manufactures <table border="1" data-bbox="1299 989 1965 1386"> <tr> <td>5 a</td> <td>Hot Dip Galvanized GI swaged tubular / octagonal poles</td> <td>Bajaj/Valmont/ Crompton/Surya/BPP/ NERI/UTKARSH</td> </tr> <tr> <td>5 b</td> <td>Hot Dip Galvanized Decorative poles</td> <td>Valmont / BPP/ NERI/ Transrail / UTKARSH any other equivalent.</td> </tr> <tr> <td>3 0 a.</td> <td>LED light Fixtures for Access Roads</td> <td>Philips/Wipro/Bajaj/Cro mpton/Osram/Havells/Li ghting Technology/</td> </tr> </table>	5 a	Hot Dip Galvanized GI swaged tubular / octagonal poles	Bajaj/Valmont/ Crompton/Surya/BPP/ NERI/UTKARSH	5 b	Hot Dip Galvanized Decorative poles	Valmont / BPP/ NERI/ Transrail / UTKARSH any other equivalent.	3 0 a.	LED light Fixtures for Access Roads	Philips/Wipro/Bajaj/Cro mpton/Osram/Havells/Li ghting Technology/
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						/NERI /Schreder/Igguzzin/ Disano/Hoffmeister or equivalent	
					3 0 b .	Decorative type street light & post top fixtures for Smart Roads	Philips / NERI / Schreder/Igguzzini/ Disano/ Hoffmeister or equivalent.
59.	325	Annexure 3 – Guidelines for Financial Proposal Annexure	3.1 Financial Proposal Covering Letter 11. We understand that you are not bound to accept the lowest or any bid you may receive. We agree to all the terms & conditions as mentioned in the RFP document and submit that we have not submitted any deviations in this regard.	3.1 Financial Proposal Covering Letter 11. We understand that CSML shall take into account all Taxes including GST, Duties & Levies for the purpose of evaluation 13. We understand that you are not bound to accept the lowest or any bid you may receive. We agree to all the terms & conditions as mentioned in the RFP document and submit that we have not submitted any deviations in this regard. Revised Financial Proposal Covering Letter furnished as Annexure 3 of this Corrigendum			
60.	336	6. Annexures	Annexure 8 – Format for Irrevocable Unconditional Performance Bank Guarantee	Revised format enclosed as Annexure 4 to this Corrigendum			
61.		BOQ 1.00	Supply, Installation and testing and commissioning of the following Decorative LED street light fixture, preferably round shaped, with individual Lights Monitoring System (ILMS) with all hard wares & softwares required for	Supply, Installation and testing and commissioning of the following Decorative LED street light fixture, preferably round shaped, with individual Lights Monitoring System (ILMS) with			

Cochin Smart Mission Limited (CSML)

			<p>power, control and communication application of each fixture. The LED fixture with programmable electronic dimmable driver with protection against short circuit, overvoltage and overcurrent with surge protection of 6 KV and with additional surge protection device of 10 KV in built surge protection also to be provided. The min weight of Aluminium body should be 13kg and finished with pure polyester powder coating process. Body to be equipped with safety cable against accidental falls .Gasket in silicon between the upper and bottom frames. LED power Module made of LED's(NICHIA/CREE/OSRAM/LUMILEDS) with individual LED's Minimum Luminous Flux (lm) is 160 lm @ 350 mA @ 85 °C. modular refractive lens in PMMA with type II/III/IV photometric distribution option. Optimal heat sink for better thermal dissipation and with NTC sensor on LED plate for control of temperature. The lens shall be mechanically fixed (not glue pasted). Rated life burning hours 50,000 hr@lumen maintenance of 90%(same should be supported by LM 80 report from NABL accredited lab), CCT<=4000K IP 66 optical and electrical compartment & impact resistance of optical compartment of the luminaire >/= IK08. Power factor > 0.95. Compliance to IS 10322/IEC 60598, IEC 62031, LM 79 & LM 80, adherence with RoHS.</p>	<p>all hard wares & software's required for power, control and communication application of each fixture. The LED fixture with programmable electronic dimmable driver with protection against short circuit, overvoltage and overcurrent with surge protection of 6 KV and with additional surge protection device of 10 KV in built surge protection also to be provided and finished with pure polyester powder coating process. Body to be equipped with safety cable against accidental falls. Gasket in silicon between the upper and bottom frames. LED power Module made of LED's (NICHIA/CREE/OSRAM/LUMILEDS) with individual LED's Minimum Luminous Flux (lm) is 160 lm @ >=350 mA900 mA- @ 85 °C. modular refractive lens in PMMA with type II/III/IV photometric distribution option. Optimal heat sink for better thermal dissipation and with NTC sensor on LED plate for control of temperature. The lens shall be mechanically fixed (not glue pasted)., CCT<=4000K IP 66 optical and electrical compartment & impact resistance of optical compartment of the luminaire >/= IK08. Power factor > 0.95. Compliance to IS 10322/IEC 60598, IEC 62031, LM 79 & LM 80, adherence with RoHS.</p>
62.	BOQ 1.01	The LED fixture shall be with suitable wattage with system lumens > 8550 lumens. Luminaire	The LED fixture shall be with suitable wattage with system lumens > 8550 lumens. Luminaire	

Cochin Smart Mission Limited (CSML)

			efficiency is > 115 lumens / Watt (Supporting LM 79 Report Should be submitted).	efficiency is > 115lumens / Watt (Supporting LM 79 Report Should be submitted). LED drive current >= 350 mA ,600 mA. Rated life burning hours 50,000 hr @ lumen maintenance of 90%(same should be supported by LM 80 report from NABL accredited lab)
63.		1.02	The LED fixture of suitable wattage with suitable system lumens > 6900 Lumens .Min Luminaire efficiency is > 100 lumens / Watt (Supporting LM 79 Report Should be submitted).	The LED fixture shall be with suitable wattage with system lumens > 8550 lumens. Luminaire efficiency is > 115lumens / Watt (Supporting LM 79 Report Should be submitted). LED drive current >= 350 mA - 600 mA. Rated life burning hours 50,000 hr @ lumen maintenance of 90% (same should be supported by LM 80 report from NABL accredited lab), L90.
64.		1.03	The LED fixture of suitable wattage with suitable system lumens > 3500 Lumens . Min Luminaire efficiency is > 100 lumens / Watt (Supporting LM 79 Report Should be submitted).	The LED fixture shall be with suitable wattage with system lumens > 3500 lumens. Luminaire efficiency is > 115lumens / Watt (Supporting LM 79 Report Should be submitted). LED drive current >= 350 mA ,600 mA. Rated life burning hours 50,000 hr @ lumen maintenance of 80% (same should be supported by LM 80 report from NABL accredited lab)
65.		BOQ 1.04	The LED fixture of suitable wattage with suitable system lumens > 3500 Lumens . (This is for post top poles in smart Roads). min Luminaire efficiency is > 100 lumens / Watt. (Supporting LM 79 Report Should be submitted).	The LED fixture of suitable wattage with suitable system lumens > 3500 Lumens. (This is for post top poles in smart Roads). min Luminaire efficiency is > 105 lumens / Watt . (Supporting LM 79 Report Should be submitted).
66.		BOQ 2.00	Supply, Installation, testing and Commissioning of LED street light fixture with pressure die cast aluminium housing body with optimal heat sink	Supply, Installation, testing and Commissioning of LED street light fixture with pressure die cast aluminium housing body with optimal heat sink for

Cochin Smart Mission Limited (CSML)

			<p>for better thermal dissipation. All the LED chips shall be with peanut lens made of PMMA to provide a good streetlight distribution. The lens shall be mechanically fixed (not glue pasted) and made of poly carbonate materials with high transmission index, delivering superior light output. Rated life burning hours 50,000 hr@lumen maintenance of 70 %, CCT in the range of 4000 K, IP 66 optical and electrical compartment & impact resistance of complete luminaire >= IK08. Power factor >0.95 with surge protection min 4 KV internal and 10 KV external. Compliance to IS 10322/IEC 60598, LM 79 & LM 80, adherence with RoHS. Luminaire efficiency > 105 lumens / Watt. The luminaire shall be controlled from feeder pillar with group control.</p>	<p>better thermal dissipation. All the LED chips shall be with peanut lens made of PMMA to provide a good streetlight distribution. The lens shall be mechanically fixed (not glue pasted) and made of poly carbonate materials with high transmission index, delivering superior light output. Rated life burning hours 50,000 hr @ lumen maintenance of 80 %, CCT in the range of 4000 K, IP 66 optical and electrical compartment & impact resistance of complete luminaire >= IK08. Power factor >0.95 with surge protection min 6KV internal and 10 KV external. Compliance to IS 10322/IEC 60598, LM 79 & LM 80, adherence with RoHS. Luminaire efficiency > 120 lumens / Watt. The luminaire shall be controlled from feeder pillar with group control.</p>
67.		BOQ 2.00	<p>Providing and fixing following IP-66 protected high power LED flood light system with pressure die cast aluminium housing with powder coating, 200 - 275 volt voltage with dimmable driver. PF > 0.9 5, should meet ANSI 2G vibration test, compliance to UL/CE with integrated dimmable driver. The driver shall be high efficiency having efficiency more than 85 % and in compliance with IEC standards. system life of 50,000 burning hours with 70 % lumens of initial lumens can be maintained. Overload and short circuit protection. Compliance to IS 10322/IEC 60598, LM 79 & LM 80. Adherence with RoHS.</p>	<p>Providing and fixing following IP-66 protected high-power LED flood light system with pressure die cast aluminium housing with powder coating, 140 - 270-volt voltage with dimmable driver. PF > 0.9 5, should meet ANSI 2G vibration test, compliance to UL/CE with integrated dimmable driver. The driver shall be high efficiency having efficiency more than 85 % and in compliance with IEC standards. system life of 50,000 burning hours with 80 % lumens of initial lumens can be maintained. Overload and short circuit protection. Compliance to IS 10322/IEC 60598, LM 79 & LM 80. Adherence with RoHS.</p>
68.		BOQ 4.00	<p>Providing and fixing following IP-66 protected high power LED flood light system with</p>	<p>Providing and fixing following IP-66 protected high-power LED flood light system with pressure die cast</p>

Cochin Smart Mission Limited (CSML)

		<p>pressure die cast aluminium housing with powder coating, 200 - 275 volt voltage with dimmable driver. PF > 0.9 5, should meet ANSI 2G vibration test, compliance to UL/CE with integrated dimmable driver. The driver shall be high efficiency having efficiency more than 85 % and in compliance with IEC standards. system life of 50,000 burning hours with 70 % lumens of initial lumens can be maintained. Overload and short circuit protection. Compliance to IS 10322/IEC 60598, LM 79 & LM 80. Adherence with RoHS.</p>	<p>aluminium housing with powder coating, 200 - 275 volt voltage with dimmable driver. PF > 0.9 5, should meet ANSI 2G vibration test, compliance to UL/CE with integrated dimmable driver. The driver shall be high efficiency having efficiency more than 85 % and in compliance with IEC standards. system life of 50,000 burning hours with 80 % lumens of initial lumens can be maintained. Overload and short circuit protection. Compliance to IS 10322/IEC 60598, LM 79 & LM 80, L80, Adherence with RoHS. resistant to corrosion and saline environments. CRI 80, IP66/IK08 rated, CCT 4000k. over all system efficacy > 120 lumens/Watt.</p>
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For further updates visit website www.etenders.kerala.gov.in, www.csml.co.in, www.kochimetro.org -Under organization name – “ Kochi Metro Rail Ltd”.

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Annexure 1 of Corrigendum

Table 3: Payment Terms.

(A) The employer will make the payment to the following items on the following terms-(Clause 15.6 GCC)

Item Type	Sl. No	Break up of payment	Percentage
Major Electrical works/ Items like LED luminaire, cables, CCMS panels, Computer server, Poles etc.	1	After supply of material to site & submission of third-party inspection certificates & acceptance.	50 %
	2	After installing as per tender specification.	20%
	3	Testing and commissioning of installed work on successful completion and commissioning of the system in section.	15 %
	4	Final Handing over	5%
	5	Balance Amount (Performance Based)	10%
	A	On Successful Completion of 2 nd year of O&M	2.5%
	B	On Successful Completion of 3 rd year of O&M	2.5%
	C	On Successful Completion of 4 th year of O&M	2.5%
	d	On Successful Completion of 5 th year of O&M	2.5%
Dismantling work	1	Dismantling at site & depositing the same at stores	95 %
	2	Final Handing over	5 %
Dismantling & Re-Installation	1	Dismantling & installation at site	70%
	2	Testing and commissioning of installed work	25%
	3	Final Handing over	5 %
O&M Charges	1	Annual Charges to be paid proportionately on Quarterly basis	
Civil Work	1	Measurement is taken after completion of the work	95%
	2	Final Handing over	5 %

(B) The payment of other items will be made as per BOQ as and when they are completed.

Annexure 2 of Corrigendum

4.7 STREET LIGHTING MANAGEMENT SYSTEM (SLMS) FOR SMART LED

4.7.1 GENERAL REQUIREMENTS OF SLMS:

The Street Lighting Control cabinet shall essentially consist of the following facilities:

- 1) Lighting control management system is required to control each luminaire point or group control as the case may be. System should have capability to schedule the operations of luminaires and accordingly control them by dimming up & down. Luminaires may be controlled through cabinet in case of emergency.
- 2) **Light Management System:** Lighting Control System should be deployed to manage the entire Street Lighting System under the scope of the project. The solution should be provided as a SaaS model. The luminaries' installation should be a plug and play format. Foolproof communication is to be provided between luminaire and Light management system (LMS). This could be using any or multiple form of communication networks, like LoRa, RF, GSM, etc. All group controls should have redundant communication system. System should exercise complete control over the streetlights and thus be able to monitor their functions / operations such as Scheduling, controlling Dimming, etc.
- 3) Primary requirement of the system is that it should be Simple, Open and Secure. System Infrastructure should be simple providing seamless end to end solution without any complexity, with simple plug and play type of solution for installation not emphasizing of any special expert knowledge. System should be such that it can be easy to use / operative for non-IT expert for daily work life. System should be easily integrated with other major system. It should use Open standard network technologies. Lighting data should be secure from any leak. Solution should be scalable and adaptable to future requirements. LMS shall (not limited to) provide following facilities:
 - Automatic (with a timer), Remote and Manual Switching Options
 - Remote Energy Measurement
 - Dimming functionality
 - Dimming should be possible from 10 to 100% however, dimming shall normally be carried out in steps as follows;
 - (a) From 10 PM to 1AM – 25%

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(b) From 1 AM till 3 AM – 50%

(c) From 3 AM till Dawn – 75%

The setting shall be adjustable / programmable at site as per the Sun rise time.

Moreover, the dimmable Luminaires shall be switched ON and switched Off in steps and in synch with the natural light during Sun rise and Sun Set time

- Near real-time monitoring
 - Alarms and Report generation.
 - Emergency override – locally and remotely.
 - Web based User Interface with Integrated Visual maps.
 - Data security and secured system access.
 - Prevent unauthorized physical access to the street light control box.
 - Uninterrupted operation, even during single phasing.
 - System integration with third party application software for smart city requirements.
 - System should be centralized exercising cabinet-based control of the street lights such as ON/ OFF, Dimming ensures an extremely high up-time and enables fast reaction to fault states.
 - The hardware modules installed in control cabinets and a full system overview is provided via the Web browser interface. Through a secure connection the system is accessible from any location and provides a fast assessment of the system's status, alarms and other events.
 - The streetlight automation system shall control and monitor streetlight electrical cabinets remotely via wireless/wired communications as the primary communications network to the server. The system shall be easily scalable to include streetlights from a small area to a citywide system rollout on the same platform. ON/OFF programming shall be enabled remotely and can be changed at any time
 - Electrical cabinet monitoring configurations shall be enabled remotely and can be changed at any time. Electrical meter readings shall be available On Demand and also in configured time intervals. Graphical view of the electrical consumption readings shall be available online for monitoring of the hourly electricity consumption
 - Power supply voltage and out-going current (from electrical cabinets to streetlights) shall be available ON-Demand. All alarm/fault detection events shall be logged and available for report-out printing for analysis.
- a) The solution should be interoperable, following standards of Indian IT Act 2000, ITAA 2008 and Information Technology (Amendment) Act, 2015. It should extent API for integration with smart city command control center.

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- 4) The web hosting/operation management with software access with API for 5 years shall be provided.
- 5) The software of the controller shall have HTTPS access over the internet. Strong password and 2 factor authentications for login to smart lighting management software. Multi-level user roles with difference access rights. Regular scheduled updates of the smart lighting management software at the frequency of 1 month or faster. 3rd party penetration tests and certificate for the last 3 years end to end application layer AES encryption. All data must be retrained by system provider for one year after the termination of contract.
- 6) The locations of these light fittings shall be seen in GUI (Graphical User Interface) from Command Centre / Control centre.
- 7) In case of light fitting failure, the notification shall be shown in GUI for the streetlight under this category

4.7.2 FEEDER PILLAR / CCMS PANEL

The CCMS unit shall be able to record and provide following parameters at variable time intervals (individual switch point wise and / or networked switching points):

- Voltage
- Current
- Power Factor
- Active Power(KW)
- Apparent Power (KVA)
- Metering KWh Cumulative
- Metering KVAh Cumulative
- Number of hours of a group of LED luminaire connected with each switch controller was glowing.
- Number of hours the power supply was unavailable.
- Special emergency on/off control.
- Benchmarking capacity so as to generate SMS for
 - Phase-wise currents on crossing threshold values
 - Phase-wise voltages on crossing threshold values - Under/over voltage detection
 - Main breaker error
 - Contactor fault
 - Circuit breaker off
 - Circuit phase errors (fuse, breaker, etc.)
 - Main power failure
 - Leakage to ground
 - Manual switch activated
 - Control cabinet door open
 - Communication failure with server

Cochin Smart Mission Limited (CSML)

Theft Alert
Individual lamp dimming
Individual/ group lamp failure.

- Smart Energy meter of class 1 accuracy with ISI marking with communication protocol IS-15959 part -II

4.7.3 SOFTWARE APPLICATION FEATURES

- 1) The web application shall be offered through the CSML website or as may be decided by the CSML at the time of execution.
- 2) The application shall enable receipt & storage of all the field data with a time stamp in Cloud.
- 3) The application shall facilitate to communicate, control and configure the each Switching point feeder pillars (FP) controllers remotely. The application shall be suitable to manage the data traffic from the field to the Cloud or Server.
- 4) Operation Time - It should be able to record LED luminaires glowing and non-glowing hours of a particular FP (Group).
- 5) The System should be suitable for third party integration following Indian IT Act inter operable standards using API.
- 8) Report Generation – shall enable Users to generate various reports related to the system performance parameters such as energy consumed report, lamp and system failure report, actual hours of operation, uptime (%), etc. as The data from the Luminaries and devices shall be transmitted on VPN using LoRa, RF or GSM or Wi-Fi with inbuilt redundancy to the SaaS based Lighting Management System located in the cloud which should be minimum Tier III certified. All software solutions which part of the LMS are should be provided as a SaaS hosted in a tier III data center with DRC. State of the art AI and big data analysis should be part of the LMS. The LMS solution shall be tested and audited by a competent third party.
- 6) well as based on historical data on daily, monthly, quarterly or annually basis as the case may be from the data/readings received from the units. The reports shall be generated in Excel as well as Graphical format.
- 7) The application should facilitate Roles and Permissions requirements at different level of user hierarchy. It should manage system access for different levels with multiple privileges for different purpose, including Administrator access to configure, work flow access for operations, and public access for viewing and uploading status.

Cochin Smart Mission Limited (CSML)

- 8) Web application shall ensure system security and safety for users at different levels with security password for various users. (Should conform to ISO 27001:2013 and OPC – UA Architecture.
- 9) It should be possible to configure Switching point remotely through web application. Remote configuration includes setting new ON/OFF timings, setting real time clock (RTC) time, viewing the Real time data of each switching point, Energy meter parameters, Resetting of the any unit, time synchronization of controller with that of Server.
- 10) The minimum interval for the update of data should be 15 minutes but programmable up to 1 minute.
- 11) Asset Management –
 - a) Application shall provide a map application that gives an overview of all Feeder Pillars / LED Street Lights on a street map or GIS map or a satellite image.
 - b) Web application software shall offer asset management feature and allow user to locate the feeder pillar / LED light through GPS coordinates. It also enables user to identify each feeder pillar / LED with unique/Asset ID with additional information like Wattage, Make, Installation date, replacement date, Replacement defect tracking. It is also possible to link details of every street light with reference to particular switching point.
- 12) Dashboard – Web application shall provide a comprehensive dashboard with real time status of switching point, real time faults of various switching points, system uptime %, power consumption, graphical representation of cumulative data etc.
- 13) The application software should be flexible to cater to customized requirement which are not foreseen at this point of time but are deemed necessary during the execution and O&M. Separate tabs shall lead to details regarding monitoring & control parameters like, Alerts, Maps, Configuration, Reports, uptime, fault penalty, history, energy savings, power failure, operational hour, lamp failure etc.
- 14) Each Switching Point FP shall be represented by a separate Tab on the dashboard to show the switch point summary indicating the FP details, rating, location, meter parameters, history of alerts, active alerts, link to the map page, etc.
- 15) The application shall generate alarm and alerts through SMSs for any type of abnormal system conditions and faults as listed below to designated users which should not be less than six in numbers.
- 16) It should describe the abnormality or fault in short as well as highlight the same with different colours to indicate the status with respect to time – within 12 hrs, in next 12 hrs, beyond a day etc. It shall provide monthly reports on the faults through email. Penalty as indicated in the Service Benchmark for the CONTRACTOR shall be calculated based on these reports.

Cochin Smart Mission Limited (CSML)

- 17) Application should be able to track the failure of lamps in a particular switching point by triggering alarm due to significant drop in power consumption. The application should display the no. of faulty lights for each phase separately instead of giving a total figure of faulty lights for all the 3 phases together.
- 18) Application shall protect and report Jamming/ hacking attempts and maintain status-quo in cases of such attempts i.e. if lights are ON, they should remain ON till the default OFF time recorded in the system. In case lights are OFF at the time of Jamming / hacking attempt, lights should remain OFF till default ON time recorded in the system
- 19) Software to have complaint handling system for light failures, with citizen interface and means of communicating repair update to complaining citizen through SMS. The complaint handling system shall be interfaced and interact with the overall grievance management system and citizen app which will be part of the command and control system
- 20) Ability to remotely upgrade the CCMS device firmware from central server.
- 21) The system shall display the following minimum faults in alarms
 - (a) Phase-wise currents on crossing threshold values
 - (b) Phase-wise voltages on crossing threshold values - Under/over voltage detection
 - (c) Main breaker error
 - (d) Contactor fault
 - (e) Circuit breaker off
 - (f) Circuit phase errors (fuse, breaker, etc.)
 - (g) Main power failure
 - (h) Leakage to ground
 - (i) Manual switch activated
 - (j) Control cabinet door open
 - (k) Low Power Factor
 - (l) Communication failure with server
 - (m) Theft Alert
 - (n) Group failure of Lights
- 22) The software shall enable to divide the city lights in certain zones as per CSML/ concerned authority requirement and assign access to the concern authorities for control and monitoring from their mobile or laptop.
- 23) All alarms shall be notified in near real-time via SMS and email to responsible maintenance team.
- 24) The system shall support auto switching of street light according to light sensor input.

Cochin Smart Mission Limited (CSML)

- 25) The system shall support auto switching of street light according to input. Graphical view of the electrical consumption readings shall be available online for monitoring of the hourly, daily and monthly electricity consumption
- 26) All Software's License shall be in the name of CSML. All costs shall be perpetual cost or onetime cost. CONTRACTOR shall provide all the upgrades to the system software and system security during the contract period without any additional cost.
- 27) The Software Application shall be supported by the CONTRACTOR even after the contract period.
- 28) The CLOUD registration shall be done in the name of CSML. Only Administrative rights shall be provided to the CONTRACTOR during the contract period. The CLOUD services shall be intact upon renewal every year after the contract period. The CLOUD shall not be OEM specific and shall be independent of OEM so that after the completion of contract period there should be no dependence on OEM for cloud services.

4.7.4 HELP DESK SETUP

The CONTRACTOR shall set up a centralized helpdesk to address the O&M of the project for entire Contract period with the following;

- (a) A web-based Complaint Management System shall be installed which should enable users to log complains and monitor its status & closure. The CMS shall be updated regularly with new updates/ patches to improve the performance during the contract period.
- (b) A Toll-Free Number exclusively for the Street lighting for Smart Roads and Access Roads shall be finalized in consultation with the CSML. Language Capabilities: Malayalam, Hindi and English;
- (c) The help desk shall operate 24X7 to assist and guide the users.
- (d) The help desk will handle user queries and issues relating to implemented solution
- (e) The helpdesk shall ensure that users can log calls and complaints for any technical issues they face while accessing the system.
- (f) The helpdesk shall have Interactive Voice Response (IVR) system for first level of call segregation.
- (g) A Standard Operating Procedures (SOP) for O&M process shall be created by the CONTRACTOR from logging of request to closure of the request. The SOP shall address call prioritization guidelines, problem security codes and escalation procedures etc. in consultation with CSML.

Cochin Smart Mission Limited (CSML)

- (h) It shall be also possible to log requests by user through other channels like email and web interface;
- (i) All the complaints and work carried out by the CONTRACTOR shall be logged in the system with a unique service request.
- (j) The application shall be accessible to all users including general public through the CSML portal for logging issues;
- (k) CONTRACTOR shall allocate Serial No to the Pole- Lamp combination and maintain records of each one of them during the Contract period.
- (l) A Report containing the operational Status of each light pole, complaints received and resolved; Preventive maintenance schedule and status, Stock of spares, man power update, etc. shall be submitted to the CSML on a weekly basis.
- (m) The call statistics will be analyzed every quarter after Go-Live and the number of Customer Care Executives may be ramped up or down accordingly on a week's notice;

4.7.5 SERVICE LEVEL BENCH MARK

A service Level Benchmark for evaluating the performance of the CONTRACTOR shall consist of the following;

- (a) Resources - CONTRACTOR shall maintain O&M team, tools and calibrated measuring and verification instruments as specified in the clause no 2.8.14 of scope of work from the start of O&M. In case the required resources are not deployed on time, a penalty of Rs.5000 per day shall be imposed for the first week and the same shall be doubled in the subsequent weeks till adequate resources are deployed.
- (b) System Uptime - CONTRACTOR shall maintain sufficient resources and achieve minimum uptime of 98% on yearly basis (year period to be decided by CSML) for the entire system, excluding the period of non-availability of power supply.
- (c) Energy meter shall be calibrated periodically from approved calibration lab. If any complaint arises in energy meter, it has to be repaired immediately. In case of major complaints, the energy meter shall be replaced.
- (d) Lux Level – CONTRACTOR shall guarantee the Lux level based on Design output and offered Luminaire for each road. There shall not be any reduction of the Lux level during the entire tenure of the contract period. Illuminance of each road shall be checked every fortnightly and reported to CSML. Any reduction in the lux level shall be immediately investigated and corrective action shall be taken with information to CSML.
- (e) In case a reduction in the lux levels are found due to reduction in the output/performance of the Luminaires, all the Luminaires of the same wattage and same batch

Cochin Smart Mission Limited (CSML)

- offered in the project shall be investigated and rectified/ replaced if found faulty by the CONTRACTOR at its own cost within two weeks or as may be agreed by CSML.
- (f) If it is not replaced within the stipulated time the maintenance charges of such lamps shall not be paid to the contractor.
 - (g) Integration of street light management system with Integrated Command Control Centre is in the scope of LED Lighting Contract. If integration is not done within one-month after the successful commissioning of SLMS, penalty of Rs. 25,000/- per week shall be imposed till the Integration is done.
 - (h) Complaint Resolution - All the complaints shall be redressed within 24 working hrs. In case the service provider fails to comply with the same a penalty of Rs. 100/- per day per complaint shall be imposed for a period of 7 days after which the amount will be doubled for the next subsequent weeks till the complaint is resolved to the satisfaction of the owner.
 - (i) At any given time the CONTRACTOR shall maintain spares equivalent to minimum 2% of the total number of lights installed. Failing to maintain spares and causing delay in resolution of the complaint shall be penalized as indicated above.
 - (j) Cleaning of the luminaire cover shall be taken up once in half year and record shall be maintained and reported to CSML. Failing which the maintenance charges of the light fixture will be deducted from the payment of maintenance charges.
 - (k) CSML shall ensure availability of power. Electricity charges and Connectivity charges shall be paid by KMC to the KSEB.
 - (l) Availability of communication network through the selected mode shall be ensured by the CONTRACTOR for data and SMSs. The CONTRACTOR shall bear the cost of connectivity of all such network charges and pay monthly/ annually as the case may be to the telecom service provider. Failing which CSML/KMC will directly deposit the amount to service provider and deduct 1.25 times the amount paid.
 - (m) The Non -availability of incoming power supply from KSEB shall be intimated by CONTRACTOR within 24 hours. CONTRACTOR shall coordinate with KSEB on behalf of CSML and CSML shall facilitate as and when required to expedite the response.
 - (n) Any complaint for failure of luminaire due to lack of earthing, SPD, connector and loose connections shall be to CONTRACTOR's Account. The contractor shall do the rectification work within 24 hours.
 - (o) The CONTRACTOR shall upgrade the software application from time to time during the contract period in terms of features, performance & security of the system.
 - (p) The CONTRACTOR shall take adequate insurance to cover themselves for the cost of O&M during the tenure of the contract including the ones due to theft.

Cochin Smart Mission Limited (CSML)

- (q) The CONTRACTOR shall make provision for adequate number of Ladder mounted vehicles self- sufficient with all the required tools and instruments, duly calibrated, to meet the maintenance requirements as per service benchmark.
- (r) All the electrical parameters and illuminance level of all the roads shall be monitored with calibrated Power Analyzer and Lux meter every three months and documented for records and analysis at regular interval as specified.
- (s) All the necessary modifications that are required to be carried out for the efficient working of the system including network and Luminaires and minimise the breakdowns and issues shall be carried out by CONTRACTOR from time to time at its own cost.
- (t) CONTRACTOR shall develop training material for the CSML/KMC/KSEBL technicians, impart them training from time to time as may be decided by the CSML.
- (u) All the responsibilities related to replacement of LED lamps / cables / other accessories shall be borne by CONTRACTOR in respect of cost, managing the technical barrier and other related aspect during the tenure of the project.
- (v) The maintenance work will be carried out without disturbing the street traffic and with proper work permit and safety.

4.7.6 CAPACITY BUILDING

- 1) The CONTRACTOR needs to provide training to CSML employees and other stakeholders as directed by CSML for capacity building;
- 2) The CONTRACTOR shall prepare all the requisite audio/visual training aids that are required for successful completion of the training for all stakeholders. These include the following for all the stakeholders:
 - (a) Training manuals for CSML employees / stakeholder departments;
 - (b) Computer based training modules;
 - (c) Presentations;
 - (d) User manuals;
 - (e) Operational and maintenance manuals for Smart Components implemented;
 - (f) And Regular updates to the training aids prepared under this project.
- 3) The CONTRACTOR shall maintain a copy of all the training material on the portal and the access will be provided to relevant stakeholders depending on their need and role. The access to training on the portal would be finalized with CSML. CONTRACTOR has to ensure the following points:
- 4) For each training session, the CONTRACTOR has to provide the relevant training material copies to all the attendees.

Cochin Smart Mission Limited (CSML)

- 5) The contents developed shall be the property of CSML with all rights.
- 6) The CONTRACTOR has to ensure that the training sessions held are effective and that the attendees would be able to carry on with their work efficiently. For this purpose, it is necessary that the effectiveness of training sessions is measured. The CONTRACTOR will prepare a comprehensive feedback form that will capture necessary parameters on measuring effectiveness of the training sessions. This form will be discussed and finalized with CSML.
- 7) After each training session, feedback will be sought from each of the attendees on either printed feedback forms or through a link available on the web portal. One member of the stakeholder group would be involved in the feedback process and he/she has to vet the feedback process. The feedback received would be reported to CSML for each training session.

4.7.7 HANDING-OVER OF THE SYSTEM DURING EXIT PERIOD

The CONTRACTOR shall hand over to the CSML the following before the expiry of the contract or in the case of termination of Contract by CSML with Justifiable reason as specified elsewhere in the RFP:

- (a) A complete list of Hard and Soft Assets with its records over the past period.
- (b) All the assets in good working condition as per tech specification or its upgraded version. In case any asset is not in working condition, CONTRACTOR shall ensure that the same is made good as per required standard and performance and handed over within the Exit period.
- (c) All software along with the confidential information related to it like user name and passwords and hardware keys if any. It shall also hand over all the rate contract if any signed with the software company for continuity of services.
- (d) Information relating to the current services rendered and technology and technical data relating to the performance of the services; Entire documentation relating to various components of the Project, any other data and confidential information related to the Project;
- (e) All other information (including but not limited to documents, records and agreements) relating to the products & services related to the project to enable CSML and its nominated agencies, or its replacing CONTRACTOR to carry out due diligence in order to transition the provision of the Project Services to CSML or its nominated agencies, or its replacing CONTRACTOR (as the case may be).
- (f) The duration of 60 working days after completion of the contract period shall be considered as Handover/ Exit period during which CONTRACTOR shall give full access to its premises, records, data base and assets related to this project.



Cochin Smart Mission Limited (CSML)

- (g) All the information as indicated above which is handed over to CSML should not be copied, sold or reused by CONTRACTOR under any circumstances without any written approval from CSML.
- (h) In case this handover happens before the completion of O&M period, the CONTRACTOR shall ensure that the technology provider shall continue to support the assets and systems till the end of the O&M Period.
- (i) The CONTRACTOR shall not retain any data, security codes, and other confidential documents including any type of customer survey data with them.
- (j) During the Exit period CONTRACTOR shall not reduce any manpower or replace any Manpower willfully as available on the day of issue of Notice. In case the CONTRACTOR reduces the manpower then CSML shall charge Rs. 1000/- Per person per day as penalty for the remaining duration of the Exit period.



Cochin Smart Mission Limited (CSML)

Annexure 3 of Corrigendum

Annexure 3 – Guidelines for Financial Proposal Annexure

3.1 - Financial Proposal Covering Letter

(To be submitted on the Letterhead of the Bidder)

Date: dd/mm/yyyy To

Managing Director
Cochin Smart Mission Limited (CSML)
10th Floor, Revenue Tower, Park Avenue,
Kochi - 682 011, India.

Sub: Bid for RFP for Implementation of Smart LEDs in ABD area of Kochi RFP Ref: No: XX

Dear Sir,

1. We, the undersigned bidder, Having read & examined in detail, the Bidding Document, the receipt of which is hereby duly acknowledged, I/ we, the undersigned, offer to supply/ work as mentioned in the Scope of the work, Bill of Material, Technical Specifications, Service Level Standards & in conformity with the said bidding document for the same.
 2. I / We undertake that the prices are in conformity with the specifications prescribed. The quote/ price are inclusive of all cost likely to be incurred for executing this work. The prices are inclusive of all type of govt. taxes/duties as mentioned in the financial bid (BoQ).
 3. I / We undertake, if our bid is accepted, to deliver the goods & services in accordance with the delivery schedule specified in the RFP.
 4. I/We undertake to successfully operationalize the entire solution as per scope of work mentioned in the RFP document.
- I/ We have examined and have no reservations to the Bidding Documents, including any corrigendum/addendums issued by CSML;
6. I/We understand that any additional hardware and software required to make the entire solution operational shall have to be provided by us.



Cochin Smart Mission Limited (CSML)

7. I/ We hereby declare that in case the contract is awarded to us, we shall submit the contract performance bank guarantee as prescribed in the RFP.
8. I / We agree to abide by this bid for a period of 180 days from the date of bid submission and it shall remain binding upon us and may be accepted at any time before the expiry of that period.
9. Until a formal contract is prepared and executed, this bid, together with your written acceptance thereof and your notification of award shall constitute a binding Contract between us.
- 10.I/ We hereby declare that our bid is made in good faith, without collusion or fraud and the information contained in the bid is true and correct to the best of our knowledge and belief.
- 11.We understand that CSML shall take into account all Taxes including GST, Duties & Levies for the purpose of evaluation & selection of L-1 bidder
- 12.We understand that you are not bound to accept the lowest or any bid you may receive. We agree to all the terms & conditions as mentioned in the RFP document and submit that we have not submitted any deviations in this regard.

In witness thereof, I/we submit this Bid under and in accordance with the terms of the RFP document.

Date: Place:

Yours
faithfully,

(Signature of the Authorized
signatory) (Name and designation of the of the
Authorized signatory)

Name and seal of Bidder/Lead Member



Cochin Smart Mission Limited (CSML)

Annexure 4 of Corrigendum

Annexure 8 – Format for Irrevocable Unconditional Performance Bank Guarantee Performance Security

..... *[Bank’s Name, and Address of Issuing Branch or Office]*

Beneficiary: *[Name and Address of Procuring Entity (Chief Executive Officer, Kota Smart City Limited, Kota)]*

Date: Performance Guarantee No.:

..... We have been informed that . . . *[name of the Contractor]* . . . (hereinafter called "the Contractor") has entered into Contract No. *[reference number of the Contract]* dated with you, for the execution of *[name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance security is required.

At the request of the Contractor, we *[name of the Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Rupees* *[amount in figures]* (Rupees.....

. . . . *[amount in words]*) such sum being payable upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

The Guarantor agrees to extend this guarantee for a specified period in response to the Procuring Entity’s written request for such extension for that specified period, provided that such request is presented to the Guarantor before the expiry of the guarantee.

This guarantee shall expire, no later than the Day of , **, and any demand for payment under it must be received by us at this office on or before that date.

.....
Seal of Bank and Authorized Signature(s)

* The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract

Insert the **date sixty days after the expected completion date, including defect liability period and operation & maintenance period, if any.



Cochin Smart Mission Limited (CSML)

- Notes: 1. All italicized text is for guidance on how to prepare this advance payment guarantee and shall be deleted from the final document.*
- 2. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*