Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.

SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

TENDER DOCUMENT

(OPEN TENDER ID: 2026_AAI_280732_2)

AIRPORTS AUTHORITY OF INDIA
OLD R.D. BUILDING
SAFDARJUNG AIRPORT
NEW DELHI – 110003

INDEX

Name of Work: "Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.

SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)"

Tender ID: 2026_AAI_280732_2

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CERTIFIED THAT THIS TENDER DOCUMENT CONTAINS PAGES 1 TO 462, SERIALLY EXCEPT INDEX AND COVER PAGE.

AIRPORTS AUTHORITY OF INDIA

DIRECTORATE OF ENGINEERING, UNIT-ER

NOTICE INVITING e- TENDER (2 Envelope Open Tender)

Tender ID: (2026_AAI_280732_2)

1. Item rate e-tenders are invited through the e-tendering CPP portal by Senior Manager (Engg. - Civil), (Bid Manager), Airports Authority of India, O/o ED (Engg.)-ER, 2nd Floor, Old R. D. Building, Safdarjung Airport, New Delhi – 110003, on behalf of Chairman, A.A.I. from the eligible contractors for the composite work of **"Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft. SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)"** at an estimated cost of **Rs. 33.19 Crores (excluding GST)** with completion period of **Eleven (11) months including 02 month considered for rain**.

The tendering process is online at CPP-portal URL address https://etenders.gov.in/eprocure/app or www.aai.aero . Prospective Tenderers may download and go through the tender document.

Prospective Tenderers are advised to get themselves register at CPP-portal, obtain `Login ID' & 'Password' and go through the instructions available in the Home Page after log in to the CPP-portal https://etenders.gov.in/eprocure/app or www.aai.aero. They should also obtain Digital Signature Certificate〔DSC〕in parallel which is essentially required for submission of their application. The process normally takes 03 days' time. The tenderer may also take guidance from AAI Help Desk Support through path aai.aero/tender/e— tender/help desk support.

(i) For any technical related queries please call the Helpdesk. The 24 x 7 Help Desk details are as below: -

Tel: 0120-4711508, 0120-4001002, 0120-4001005, 0120-6277787
E-mail: support-eproc@nic.in
International bidders are requested to prefix 91as country code.

Tenderers are requested to mention the URL of the Portal and Tender ID in the subject while emailing any issue along with the contact details.

Before submitting queries, bidders are requested to follow the instruction given in "**Guidelines to Bidders**" and get their computer system configured according to the recommended settings as specified in the portal at "**System Settings for CPPP**".

(ii) For any further technical assistance with regard to functioning of CPP portal the tenderer may contact to the following AAI help desk numbers on all working days only between

Sl. No.	Support Persons	Escalation Matrix	E-mail Address	Contract Numbers	Timings*

1	Technical Help Desk Team	Instant Support	eprochelp@aai.aero	011-24632950 Ext. 3512	0800-2000 Hrs. (MON – SAT)
2	JE (IT)	After 4 Hrs. of Issue	etendersupport@aai.aero or vaibhav_g@aai.aero	011-24632950 Ext. 3523	0930-1800 Hrs. (MON –FRI)
3	Sr. Manager (IT)	After 12 Hrs.	shripatim@aai.aero	011-24632950 Ext. 3506	0930-1800 Hrs. (MON –FRI)
4	Jt. GM (IT)	After 24 Hrs.	Sunil.km@aai.aero	011-24632950 Ext. 3506	0930-1800 Hrs. (MON –FRI)
5	General Manager (IT)	After 03 Days.	gmit@aai.aero	011-24657900	0930-1800 Hrs. (MON –FRI)

*The help desk services shall remain closed on all Govt. Gazetted Holidays.

Tender processing fee of **Rs. 5,900/- (i/c GST), non-refundable** will be required to be paid online on CPP Portal only.

Earnest Money Deposit (EMD) of **Rs. 99,60,000/- (Ninety-Nine Lakh Sixty Thousand only)** will be required to be paid online on CPP portal.

Or

EMD may be submitted in the form of Insurance Surety Bonds or Bank Guarantee (including e- Bank Guarantee) from any of the Scheduled Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative/Regional Rural Banks).

Advisory for Applicant and its **BG issuing Bank Branch** is also mentioned in the **Annexure-2** of tender document.

The Bank Guarantee (PBG/BG-SD/FBG) in accordance with the bank details as:

CORPORATE NAME	:	AIRPORTS AUTHORITY OF INDIA
BANK NAME	:	ICICI BANK
IFSC CODE	:	ICIC0000007
BG ADVISING MESSAGE	:	IFN760COV (BG ISSUE)
	:	IFN767COV (BG AMENDMENT)

UNIQUE IDENTIFIER CODE (7037): AAICORHQ

2. Following 2 envelopes shall be submitted through online at CPP-portal by the tenderer as per the following schedule: -

CRITICAL DATA SHEET

Publishing Date	21.07.2026
Bid Document Download / Sale start Date	From 1800 hrs. On 21.07.2026
Clarification Start Date	From 1800 hrs. On 21.07.2026

Pre-Bid Conference date and venue	27.07.2026 at 1100 hrs Venue: Mediation Hall, Air India Building, near Jor Bagh Metro Gate No.3, New Delhi-110003
Clarification End Date	Till 1800 hrs. On 30.07.2026
Bid submission Start date	From 1800 hrs. On 21.07.2026
Bid submission End date	Till 1800 hrs. On 14.08.2026
Last date and time of submission of original Insurance Surety Bond/ BG against EMD, if not paid online on CPP Portal	Till 1800 hrs. On 18.08.2026
Bid Opening date (Envelope I)	At 1500 hrs. On 19.08.2026
Bid Opening date (Envelope II)	At 1500 hrs. On 31.08.2026 (In case the date of opening is changed, the same shall be intimated through CPP portal)

***Note:1**. If the bidder has any query related to the Bid Document of the work, they should use 'Seek Clarification' on CPP portal to seek clarifications. No other means of communication in this regard shall be entertained.*
***Note:2**. Under no circumstances bid procedure related queries shall be referred to the Independent External Monitors (IEMs).*

Envelope-I (EMD, if not paid online on CPP Portal, Technical Bid and Pre-qualification):

- Bid containing following:

A. EMD, if not paid online on CPP Portal:

Scanned Copy of Insurance Surety Bond (as per **Appendix-IA**) / BG (as per **Appendix-IB**) against EMD with copy of the SFMS (Structured Financial Messaging System) BG confirmation message sent by the BG issuing bank to ICICI bank, if EMD not paid online on CPP Portal along with letter of undertaking **(as per Appendix- XIA).**

B. Technical Bid containing the following: -

i. Scanned copy of Tender Acceptance Letter on Bidder's Letter Head (as per **Annexure-1**).

ii. Scanned copy of Permanent Account Number (PAN) and GST Registration number.

iii. Scanned copy of 'Undertaking' regarding Blacklisting/ Debarment on Bidder's Letter Head (as per **Annexure-3)**.

iv. Scanned copy of **Form-A** - details of similar works completed during last seven years supported with completion certificate issued by client.

v. Scanned copy of **Form-B** - Financial Information (Average Annual Turnover).

vi. Scanned copy of **Form-C** – Net Worth.

vii. Scanned copy of **Form-F** - Annual value of General Construction / Engineering Work.

viii. Scanned copy of Signed Integrity Pact as per **Appendix-XVIII** of GCC**.**

ix. Bidder shall submit scanned copy of 'Undertaking' on Company's Letter Head that I / We will deploy sufficient plant and machinery as per the requirement of work in consultation with the Engineer-in-Charge (E-I-C) to achieve the milestones/targets and overall completion within the time period.

Tenderer shall submit scanned copy of 'Undertaking' on Company's letter head as per format at **Annexure- 4**.

x. Bidders other than propriety firm shall submit, scanned copy of Authorization letter / Power of Attorney along with copy of Certificate of incorporation of the Company under Companies Act showing CIN/ LLPIN/ Name of Directors of the Company & Copy of Board Resolution regarding Authority to assign Power of Attorney.

Proprietary firm shall submit scanned copy of Authorization letter / Power of Attorney only if the tender is processed by a person other than proprietor.

xi. **PQ Performa** duly filled.

C. Qualifying requirements of contractors / tenderers containing the following: -

i) Tenderer should have successfully completed or substantially completed three works, each of **₹ 13.28 Crores (excluding GST)** or two works, each of **₹ 16.60 Crores (excluding GST)** or one work of **₹ 26.55 Crores (excluding GST)** in single contract of similar nature of work* during last seven years ending last day of month previous to the one in which tenders are invited i.e. **30.06.2026**.

* **Similar nature of work i.e. Experience in completion of Rigid / Flexible pavement works in Airfield / National Highways (minimum 4 lane) / Expressways.**

The details of similar works completed during last seven years shall be submitted in the given format- **Form-A** with supporting documents issued by client.

Note:

1. *The Experience Certificates of works completed pre-GST era, Completion amount will be divided by 1.12 (to exclude pre-GST taxes) to make it at par with experience certificates of post GST era but excluding GST.*
2. *Experience gained by executing work on back-to-back contract/ Sub-contract basis is acceptable in the following conditions:*

(a) Work should be actually executed by the second agency (sub-contractor) with due concurrence of the owner as tripartite agreement/ written approval. It should be backed by valid agreement and experience certificate.

(b) Payments received by second agency should be reflected in TDS certificates.

*3. Experience gained in composite works for the specialized nature of works (List of Specialized Items / Jobs / Works as mentioned in **Annexure-11**) were executed by main contractor either by in-house expertise & experience or by engaging the specialized agencies with the approval of main client as per contract conditions. In such cases, main contractor as well as specialized agency both get the experience certificate for the same work from their respective client(s) i.e. main contractor for composite work along with specialized works from owner and specialized agency for specialized work(s) from the main contractor.*

In this situation, the experience certificate of either specialized agency or main agency having in-house expertise & experience, who has actually executed the specialized work(s), shall be considered for Technical /Pre-qualifying criteria in similar specialized nature of work(s).

4. Substantial completion shall be based on 80 (eighty) per cent (value wise) or more works completed under the contract. Substantial completion should not be defined in terms of percentage completion. rather it should be based on functional consideration.

Certificate for 'substantial completion' of project/work/asset should contain two parts. Part -1 shall contain 'financial value of work done' and part-11 shall contain 'certificate of functional completion of project/work/asset'.

"The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to date of bid opening (Cover-I/Technical bid)."

Client certificate for experience should show the nature of work done, the value of work, date of start, date of completion as per agreement, actual date of completion and satisfactory completion of work. **Tenderers showing work experience certificate from non-government/non-PSU organizations should submit copy of tax deduction at sources (TDS) certificate(s) along with a certificate issued by registered Chartered Accountant, clearly specifying the name of work, total payment received against the work and TDS amount for the work.**

ii) Should have annualized average financial turnover of **₹ 11.75 Crores** (including GST) on construction works during last three years ending **31.03.2025**. The Financial Information shall be submitted in the given format – **Form-B**.

Tenderers showing continuous losses during the last three years in the balance sheet shall be summarily rejected.

iii) The tenderer should have a minimum net worth of **₹ 4.98 Crores**, issued by certified Chartered Accountant. Net Worth of the company shall not be eroded by

more than 30% in last three financial years. The Certificate should be submitted in the given format- **Form-C**.

iv) The tenderer should have achieved minimum annual value of general construction / engineering work of **₹ 66.38 Crores** (excluding GST) (as certified by Chartered Accountant and at least **₹ 33.19 Crores** (excluding GST) is from Engineering (Civil/ Electrical/ Mechanical as relevant to the work being procured) construction works) carried out in any of the year during last five (05) years, ending on 31.03.2025. The Financial Information should be submitted in the given format- **Form-F**.

Scanned copy of all the documents of Envelope-I mentioned above shall be submitted on the CPP portal. If EMD not paid online on CPP Portal, Original/ Hard Copies of Insurance Surety Bond/ BG against EMD and copy of SFMS BG confirmation message sent by the BG issuing Bank is required to be submitted/sent to the **Senior Manager (Engg.-Civil) (Bid Manager)** Airports Authority of India, O/o Executive Director (Engg.)-ER, Corporate Head Quarters, 2nd Floor, Old R. D. Building, Safdarjung Airport, New Delhi – 110003 on or before date & time mentioned in CRITICAL DATA SHEET. The bidder, whose Insurance Surety Bond/ BG against EMD are not received by the date & time mentioned in critical data sheet, then their tenders will be liable to be rejected. Any postal delay will not be entertained.

Envelope-II: - The Financial e-Bid through CPP portal.

All rates shall be quoted in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the tenderers. Tenderers are required to download the BOQ file, open it and complete the blue coloured (unprotected) cells with their respective financial quotes and other details (such as name of the tenderer). No other cells should be changed. Once the details have been completed, the tenderer should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the tenderer, the bid will be rejected.

3. **Refund of EMD**

EMD deposited by all the bidders except the confirmed lowest bidder shall be returned within one week from the date of opening of the financial bid. EMD of the successful bidder shall be returned on receipt of Security Deposit equivalent to EMD amount/ performance bank guarantee.

4. **Bid Submission: -**

The tenderer shall submit their application only at CPP portal https://etenders.gov.in/eprocure/app. Tenderer/contractor are advised to follow the instruction, provided in the tender document for online submission of bids. Tenderers are required to upload the digitally signed file of scanned documents as per para 2. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.

Uploading of application in location other than specified above shall not be considered. Hard copy of application shall not be entertained.

5. Not more than one tender shall be submitted by one tenderer or tenderers having business relationship. Under no circumstance will father and his son(s) or other close relations who have business relationship with one another (i.e. when one or more partner(s)/director(s) are common) be allowed to tender for the same contract as separate competitors. A breach of this condition will render the tenders of both parties liable to rejection.

6. Tenderer who has downloaded the tender from Central Public Procurement Portal (CPPP) website http://etenders.gov.in/eprocure/app, shall not tamper/modify the tender form including downloaded price bid template in any manner. In case if the same is found to be tampered/modified in any manner, tender will be completely rejected and EMD would be forfeited and tenderer is liable to be banned from doing business with AAI.

7. **Bids Opening Process is as below: -**

Envelope-I: (EMD, Technical bid and Pre-qualification):

Envelope-I containing documents as per Para 2(A), (B) and (C) (uploaded by the tenderers) shall be opened on date & time mentioned in CRITICAL DATA SHEET.

If the bidder has any query related to the Bid Document of the work, they should use 'Seek Clarification' on CPP portal to seek clarifications. No other means of communication in this regard shall be entertained.

If any clarification is needed from the tenderer about the deficiency in his uploaded Documents in Envelope-I, he will be asked to provide it through CPP portal, if required. The tenderer shall upload the requisite clarification/documents within time specified by AAI, failing which it shall be presumed that bidder does not have anything to submit and bid shall be evaluated accordingly.

The intimation regarding acceptance/rejection of their bids will be intimated to the tenderer through CPP Portal.

Envelope-II (Financial Bid):

Envelope-II containing financial bid of the tenderers found to be meeting the technical criteria and qualifying requirements shall be opened on date & time mentioned in CRITICAL DATA SHEET. **(In case the date and time for opening of Envelope-II (Financial bid) is required to be changed, the same shall be intimated through CPP portal)**.

8. AAI reserves the right to accept or reject any or all applications without assigning any reasons. AAI also reserves the right to call off tender process at any stage without assigning any reason.

9. AAI reserves the right to disallow the working agencies whose performance at ongoing project(s) is below par and usually poor and has been issued letter of restrain/debarment/blacklisting by Airports Authority of India (AAI)/ Ministry of Civil Aviation (MoCA)/ Department of Expenditure (DoE), Ministry of Finance and the debarment/blacklisting/restrainment is not in force as on last date of opening of tender. **AAI reserve the right to verify the credential submitted by the agency at any stage (before or after the award the work). If at any stage, any information /documents submitted by the applicant is found to be incorrect/false or have some discrepancy which disqualifies the firm then AAI shall take the following action:**

   a. Forfeit the entire amount of EMD submitted by the tenderer.

   b. The tenderer shall be liable for debarment for a period upto two years from tendering in AAI, including termination of the contract apart from any other appropriate contractual/legal action.

10. Consortium /JV companies shall not be permitted.

11. Purchase preference to Central Public Sector Undertaking shall be applicable as per the directive of Govt. of India prevalent on the date of acceptance.

12. Concessions to Indian Micro & Small Enterprises (MSEs) units registered with DIC/NSIC/KVIC/KVIB/ Directorate of Handcraft and Handloom etc. to be given as per the provisions of Public Procurement Policy for MSEs order 2012 with up to date amendments, shall be applicable for tenders of supply/services and shall not be extended to construction work.

13. Tenderers have to submit Unique Document Identification Number (UDIN) generated documents like Balance Sheet/Turnover certificate, Working Capital Certificate (works done during last 5 financial years & works in hand), Net worth Certificate, Tax Deduction at Source (TDS) Certificates for Non- Govt. works etc. as per NIT conditions duly certified by CA and having UDIN. The documents submitted by bidders without UDIN shall not be entertained.

14. Department of Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, issued Public Procurement (Preference to Make in India), Order 2017 vide OM No. P-45021/2/2017-PP(BE-11) dated 16.09.2020 is applicable **(as per Annexure-8)**.

15. Requirement of registration by the Bidder from a country sharing land border with India based on order No. F No. 6/18/2019-PPD dated 23/07/2020 of Government of India, Ministry of Finance, Department of Expenditure (Public procurement Division) with up to date amendments, regarding restriction under Rule 144(xi) of the General Financial Rules {GFR) 2017 shall be applicable. Bidder shall submit scanned copy of 'Undertaking' on Company's letter head in this regard. **(Annexure- 9)**.

IMPORTANT NOTES:

a. For determining eligibility of tenderer in terms of experience certificate, completion cost shall be considered exclusive of GST, ESI, PF and AICMC cost. The Bidder shall give undertaking mentioning whether the GST/Pre-GST Taxes, ESI & PF are included in the completion cost or not in the client completion certificate, if included, the

bidder shall mention the percentage/ break up cost of these components (as per **Annexure 10**).

b. In case of non-submission of required undertaking/not providing details of related components, then AAI shall determine GST/Pre-GST Taxes, ESI & PF components as per CPWD / AAI guidelines amended from time to time and shall carry out further evaluation accordingly.

Bid Manager

General Instructions for Online Bid Submission:

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are generally meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: http://etenders.gov.in/eprocure/app

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: http://etenders.gov.in/eprocure/app) by clicking on the link "**Online bidder Enrollment**" on the CPP Portal which is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify/ nCode/ eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ schedule and generally, they can be in PDF /XLS /RAR /DWF formats. There is no limit on the size of the file uploaded at the server end. However, the upload is decided on the Memory available at the Client System as well as the Network bandwidth available at the client side at that point of time. In order to reduce the file size, bidders are suggested to scan the documents in 75-100 DPI so that the clarity is maintained and also the size of file also gets reduced. This will help in quick uploading even at very low bandwidth speeds.
4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or ''Other Important Documents'' area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3) Bidder has to select the payment option as "online" to pay the tender processing fee/ EMD as applicable and enter details of the instrument.
4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other

cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

9) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

Any bid related issue/ query pertaining to technical support or otherwise on CPP portal (URL:-https//etender.gov.in/eprocure/app) for submission of tender documents should be addressed to AAI Help Desk Support (details also mentioned in the web-NIT) as below:

(i) Call Helpdesk. 24 x 7 Help Desk Number 0120-4200462, 0120-4001002, Mobile: 91-8826246593 or can send e-mail at: support-eproc@nic.in Bidders are requested to mention the URL of the Portal and Tender ID in the e-mail sent along with their contact details.

(ii) For any further technical assistance with regard to functioning of CPP portal, the bidder should contact personnel at following AAI help desk numbers on all working days as below:
08.00 hrs. to 20.00 hrs. (Mon – Sat)
011-24632950, Ext – 3512 (Six Lines), e-mail – eprochelp@aai.aero
0930 hrs. to 1800 hrs. (Mon – Fri)
011-24632950, Ext – 3523, e-mail: etenderssupport@aai.aero, sanjeevkumar@aai.aero, snita@aai.aero

0930 hrs. to 1800 hrs. (Mon – Fri)

011-24657900, e-mail: gmitchq@aai.aero

In case of technical support regarding e-tender portal, if the AAI Help Desk is non-responsive the Bid Manager can be contacted as below on all working days from 0930 hrs. to 1800 hrs.

Name	**:**	**Sh. Chetan Kumar Verma** **Senior Manager (Engg. - Civil)**
Telephone No.	**:**	**011-24632950**
Extension No.	**:**	**3387**
Mobile No.	**:**	**+91-8976056649**
E-mail ID	**:**	**ckv@aai.aero**

All bid procedure related queries be referred to HELP DESK as above and then to Bid Manager only.

Please note that under no circumstances bid procedure related queries shall be referred to the Independent External Monitors (IEMs).

Standard Operating Procedure
for
Online payment, refund and settlement of EMD and Tender Fee through CPP Portal

e-Tendering brings in economy, efficiency and transparency in the procurement of goods, works and services. CVC are inclined to force implementation of e-Tendering in all Govt. departments & PSUs. Online payment gateway for payment, refund and settlement of EMD and Tender Fee is part of the implementation of e-Tendering system i.e. CPPP https://etenders.gov.in .

Stakeholders:

1. **Tender Floating Department:** Airports Authority of India (AAI)
2. **The Technical Service Providers (TSP)** - NIC to facilitate CPP Portal with entire back end process and providing technical support to the Government Dept.
3. **Bank** - AAI has authorized State Bank of India as nodal bank provides payment gateway services and receives Tender fees and Earnest Money Deposits (EMDs) from various bidders participating in e- Tendering/ e-procurement process, holds the amount in Current/Savings Bank account till the time of finalization of tendering process. Bank will settle the Tender Fee of all bidders, Bank will refund EMD to unsuccessful bidders and the EMD of L 1 bidder will remain in the pooling account and after AOC completion on the portal, the L 1 bidders EMD amount will be refunded to their source account. This will be happened as per instruction received from TIA through online portal. Customized MIS will be provided to the Tender Floating Department i.e. AAI.
4. **The Bidders** - The bidders are organizations/corporate/individuals who apply for the tender floated by the tender floating department and participate in the tendering process.
   Bidders are directly involved in making the use of this e-System for making payments and getting refunds into their accounts.

Eligibility (Prerequisite for e-Tendering)

1. Tender Inviting Authorities (TIA) & the bidders should enroll on CPP Portal https://etenders.gov.in to carry out the procurement activities.
2. Portal login will be through two factor authentication i.e. User id & password followed by the login through DSC.
   - TIA must have Digital Signature Certificate (DSC) with Signing and Encipherment feature
   - Bidders must have DSC with Signing feature

Bank Account Details

a. Common Pooling A/C for EMD and Tender Fee Collection
b. Tender Fee Settlement A/c for Settlement of Non-refundable Tender Fee amounts
c. Forfeited EMD Settlement A/c for Settlement of forfeited EMD amounts

Payment gateway for End to End Procedures:

1. **Collection Process**:

   a. **Online collection of EMD and Tender Fee**: As per current provision in the portal, TIA will allow the option of **Online Mode** for collection of EMD and Tender Fee while publishing

tender, so that the bidders can deposit these fees through **Net Banking** (SBI and Other Banks) and **NEFT/RTGS**.

b. **Collection of EMD through Bank Guarantee(BG):** During the tender creation TIA will allow the option of "**EMD through BG or EMD Exemption"** so that bidders will be able to upload the copy of BG or Exemption certificate as per tender terms and condition.

Note: *Keeping in the view of running tender status, the portal currently has both online and offline payment options for next few days, after which the offline mode will be disabled.*

2. During the collection process the amount will be debited from the bidder account and credited to the collection pooling account of the AAI.

3. Till the tender opening all the collected amount will be residing in the collection pooling account of AAI.

4. **Refund and Settlement process:**

   a. **Step-I:** After opening the tender, bid submitted successfully along with the online payment, the tender fee settled to 'Tender Fee Settlement Account' and EMD amount will remain in 'Pooling Account'.
   b. **Step-II: On Technical Evaluation**: After submission of technical evaluation report on the CPP portal, the 'EMD of Technically Qualified bidders will remain in the pooling account' and EMD amount of rejected bidders will be refunded to their source account.
   c. **Step-III: On Financial Evaluation:** After submission of financial evaluation report on the CPP portal, the 'EMD of L1 bidder will remain in the pooling account' and EMD amount of rejected bidders will be refunded to their source account.
   d. **Step-IV: EMD Refund of L1:** After AOC completion on the portal, the L1 bidders EMD amount will be refunded to their source account and for this Bid managers are advised to complete the AOC process:
      - Only after receiving the PBG and its confirmation from the bank.
        or
      - Adjustment of Security Deposit (SD) as per NIT Condition.

5. **In the case of "Cancellation of tender" before opening and "Re-Tender":**

   - All the submitted amount will be refunded to the bidders.

6. **In the case of "Cancellation of tender" after opening and "Re-Tender":**

   - The tender fee has already settled to the AAI's tender fee settlement account at the EoD of tender opening.
   - Now only EMD residing in the collection pooling account, the EMD will be refunded to the bidders.

7. **In case of 'Withdraw of bid' by the vendor:**

   - Procurement system allows the bidder to withdraw till the bid submission closing date, assume that the bidder has paid the amount and withdrawn the bid, eProcurement system will initiate the refund of EMD on the day of tender opening.

8. **In case of Revocation Corrigendum:**

   - If TIA publishes revocation corrigendum to accept the rejected bidder than TIA must ask EMD again via offline mode before publishing the revocation corrigendum because EMD amount has already been refunded or refund initiated to the rejected bidders A/c.

9. **Procedure for Forfeiture of EMD through CPP Portal**:

   Forfeiture activity can be performed at the time of rejection of the bidder.

   Step I: Rejected the bidder during the Technical or Financial Evaluation process.
   Step II: On the same day, use the menu "Forfeiture Menu" to Forfeit the EMD.
   Step III: Select the tender and then the bidder to forfeit the EMD
   Step IV: At the end of the day System will settle the Forfeited EMD to "Forfeited EMD Settlement A/c"

   Note: ***Forfeiture of EMD will have to be claimed on same day of rejection otherwise it will not be available in the system because at the end of the day CPPP will initiate refund to the rejected bidders.***

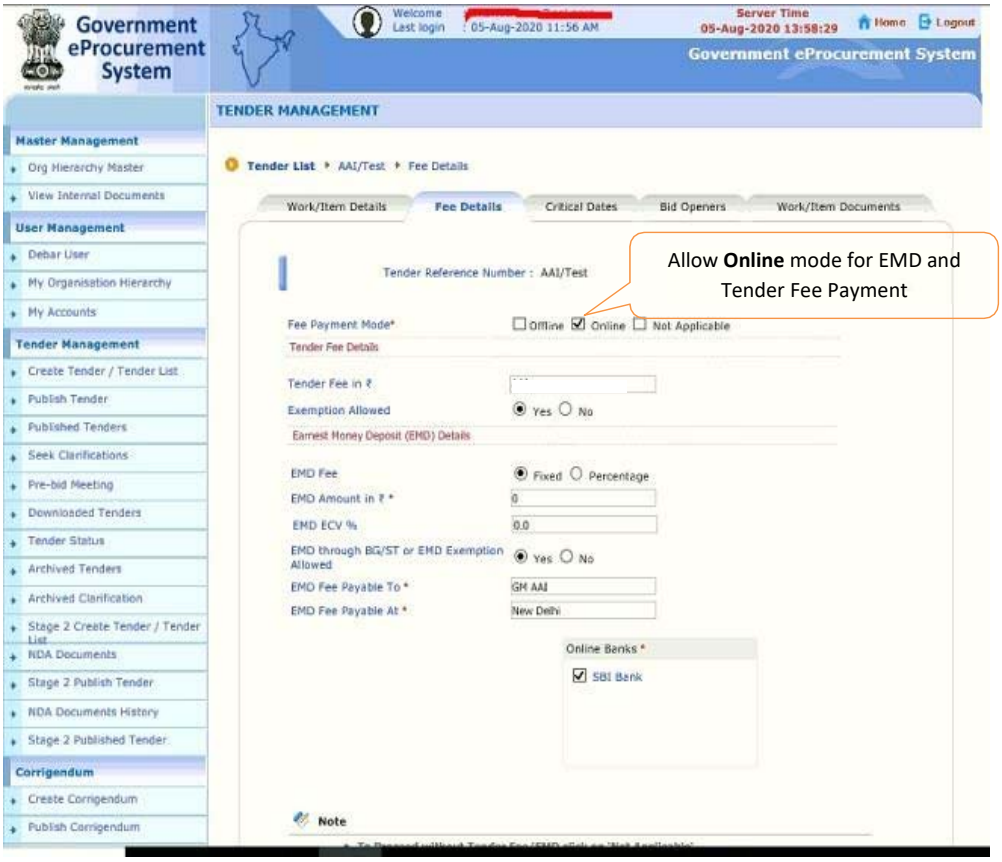
10. **Following procedures are attached on subsequent pages:**

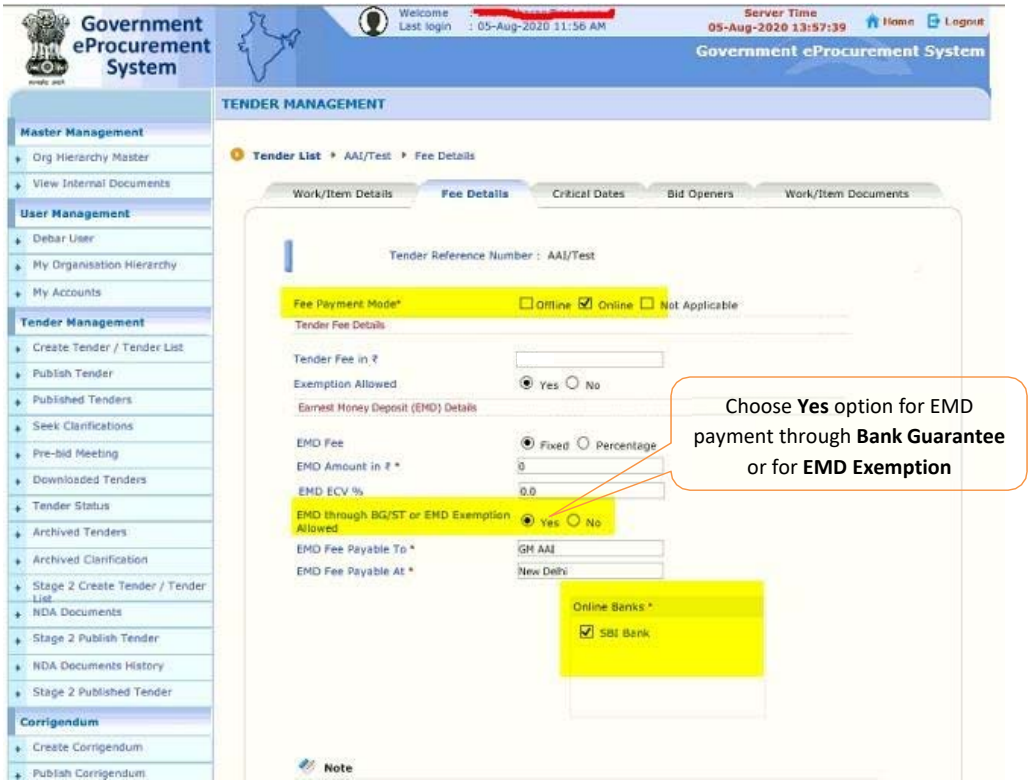
    a. Procedure to allow the online **Payment Option** in CPP Portal by TIA
    b. Procedure for checking the **Payment Status** by TIA
    c. Procedure for **Online Collection** of EMD and Tender Fee from Bidders

Procedure to allow the Online Payment Option in CPP Portal by TIA

1. TIA/Bid Manager will login to the portal https://etenders.gov.in/ with valid User ID (i.e. User ID mapped with Digital Signature Certificate) and follow the process of tender creation.

2. After completion of Basic and Cover Details go to next stage for Fee Details and select the option as per below screen:




Government eProcurement System
Welcome
Last login : 05-Aug-2020 11:56 AM
Server Time
05-Aug-2020 13:57:39
Home
Logout
Government eProcurement System
TENDER MANAGEMENT
Master Management
Org Hierarchy Master
View Internal Documents
User Management
Debar User
My Organisation Hierarchy
My Accounts
Tender Management
Create Tender / Tender List
Publish Tender
Published Tenders
Seek Clarifications
Pre-bid Meeting
Downloaded Tenders
Tender Status
Archived Tenders
Archived Clarification
Stage 2 Create Tender / Tender List
NDA Documents
Stage 2 Publish Tender
NDA Documents History
Stage 2 Published Tender
Corrigendum
Create Corrigendum
Publish Corrigendum
Tender List ▸ AAI/Test ▸ Fee Details
Work/Item Details
Fee Details
Critical Dates
Bid Openers
Work/Item Documents
Tender Reference Number : AAI/Test
Fee Payment Mode*
Offline
Online
Not Applicable
Tender Fee Details
Tender Fee in ₹
Exemption Allowed
Yes
No
Earnest Money Deposit (EMD) Details
EMD Fee
Fixed
Percentage
EMD Amount in ₹ *
EMD ECV %
EMD through BG/ST or EMD Exemption Allowed
Yes
No
EMD Fee Payable To *
GM AAI
EMD Fee Payable At *
New Delhi
Online Banks *
SBI Bank
Note
Choose Yes option for EMD payment through Bank Guarantee or for EMD Exemption

Procedure for checking the Payment Status by TIA

1. Payment confirmation can be find out at the time of Tender Opening process.
2. TIA/Bid Manager will login to the portal https://etenders.gov.in/ with valid User ID (i.e. User ID mapped with Digital Signature Certificate) and follow the process of tender opening.
3. After opening of tender, click on **first cover** (i.e. Fee Cover) and select Bid Opening or Quick Bid Opening option against each Bidder.
4. Payment status will be checked/verified for Individual Bidders.
5. Click on View Paid Information link and get the bidder details along with Payment detail.
6. If Status is seen as **"Success"** it means that bidder has successfully paid for Tender Fee/EMD Successfully. Screen shot is attached herewith for the reference.

Government eProcurement System

Government eProcurement System

Bid Submission Confirmation

Date : 30-Jul-2020 06:20 PM

Print

Bid Information	
Bid ID :	**181504**
Bidder Name :	
Organisation Chain :	Airports Authority of India||Western Region - AAI||AHMEDABAD - AAI||ENGG ELECT-VAAH - AAI
Tender Ref No :	AAI_AH_COMML_112_PPE OUTLET
Tender ID :	2020_AAI_52772_1
Tender Title :	PPE Equipment Outlet
Bid Submitted Date & Time :	**19-Jul-2020 05:36 PM**

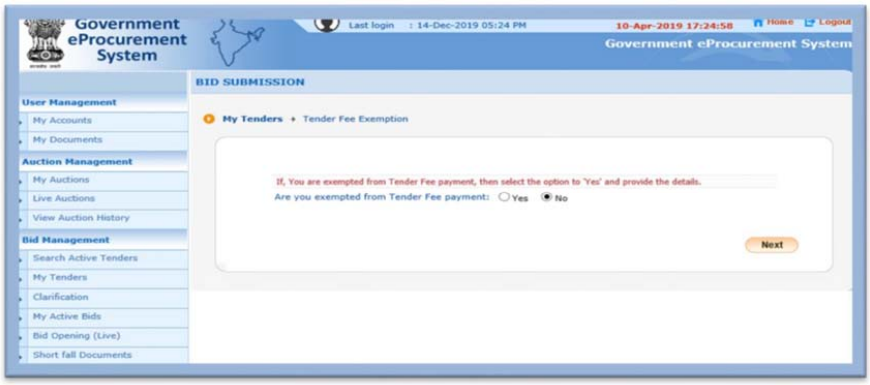
Corporate Tenderer Details			
Login ID:	satyatraders94@gmail.com	**User Type:**	Corporate/Bidder
Company Name:	SATYA TRADERS	**Registration Number:**	AS03E0003466
Registered Address :	Ground Floor, Intuc Complex, K.C. Sen Road, Opp. Tribeni Lodge, Paltan Bazar, Rehabari, Guwahati	**Name of Partners / Directors :**	SATYANARAYAN ROY
City :	GUWAHATI	**State :**	Assam
Postal Code :	781008	**PAN Number:**	ARXPR8246F
Company's Establishment Year (yyyy):	2009	**Company's Nature of Business:**	TRADING AND SERVICES
Company's Legal Status:	Others	**Company Category :**	Micro Unit as per MSME
Title :	Mr	**Contact Name:**	SATYANARAYAN ROY
DOB (Date Of Birth):	12-Apr-1985	**Designation :**	PROPRIETOR
Correspondence Email:	satyatraders94@gmail.com	**Phone :**	91 - 0 - 9864036333
Mobile:	91-9864036333		

Bank Response On Payment Details	
eProcurement Ref. Number :	**56707181504**
PRN Number :	**56707181504**
Bank / UTR Number :	**CPAAFAKSO8**
Bank Name :	**SBI Bank**
Status :	**Success**
Tender Fee in ₹ :	**2,000**
EMD Fee in ₹ :	**50,000**
Total Fee in ₹ :	**52,000**

EMD and Tender Fee both paid successfully

Procedure for Online Collection of EMD and Tender Fee from Bidders

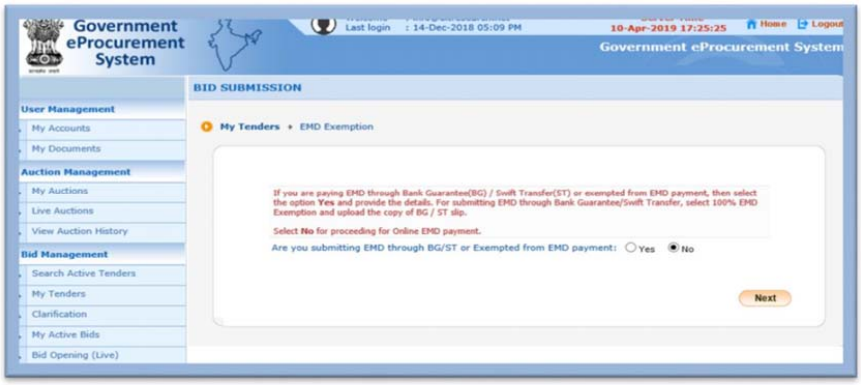
1. Bidder will login to the portal https://etenders.gov.in/ with valid User ID (i.e. User ID mapped with Digital Signature Certificate) and follow the process of participation to the tender.
2. After Login search the tender in "Search Active Tender" tab with different criteria after that click on "set as favorite" to move on "My Tender". Then click on "My tender" and view the tender details and click on proceed for Bid Submission.
3. For submission of online Tender Fee and EMD, click on Button as "Pay Online"
4. **In case of Tender Fee**: If the Bidder is exempted from the tender fee payment, then select the option to "**Yes**" other wise "**NO**" as per below screenshot:



5. **In case of EMD:** If Bidder is paying EMD through any of below options, Select the option **"Yes"** (as per below screenshot) and provide the details and upload copy as a proof.
   - **Bank Guarantee (BG)/Swift Transfer (ST)**
   - **Exempted from EMD Payment**,

   Note: *For submitting* ***"EMD through BG/ST" or "Exemption from EMD payment"*** *bidder must select "****Yes****" otherwise bidders will not have the option to pay EMD through* ***Bank Guarantee****. Once proceeded it is not possible to revert the option.*

6. Select option "**NO**" (as per below screenshot) for proceeding for Online EMD payment.



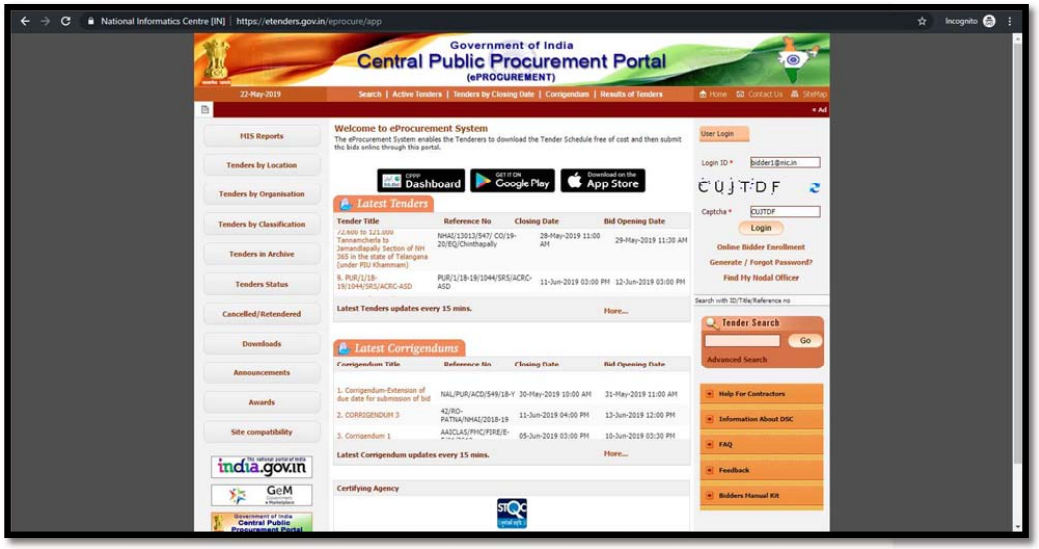
After selecting the option, click on "Next" Button as per above screenshot. Further process to be followed as per subsequent screen.

STEPS FOR MAKING TENDER PAYMENTS IN ETENDERS SYSTEM VIA SBI BANK GATEWAY

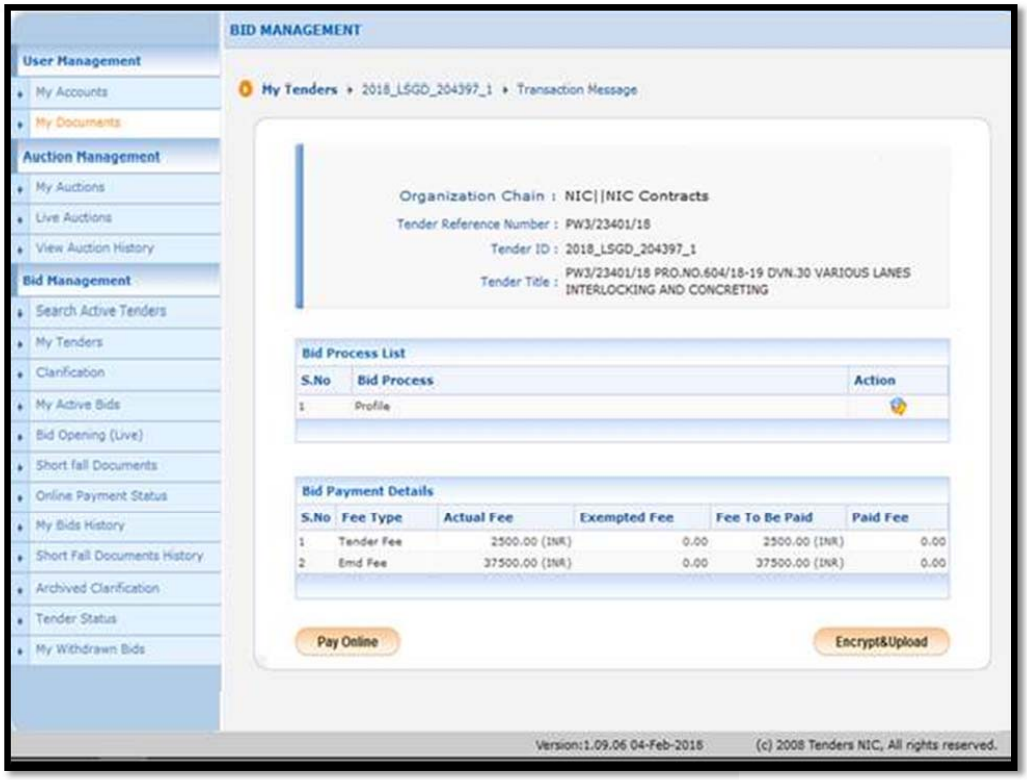
(SBI AND NON SBI ACCOUNT HOLDERS)

Home Page.

Login as a bidder into *etenders.gov.in* to proceed for payment.

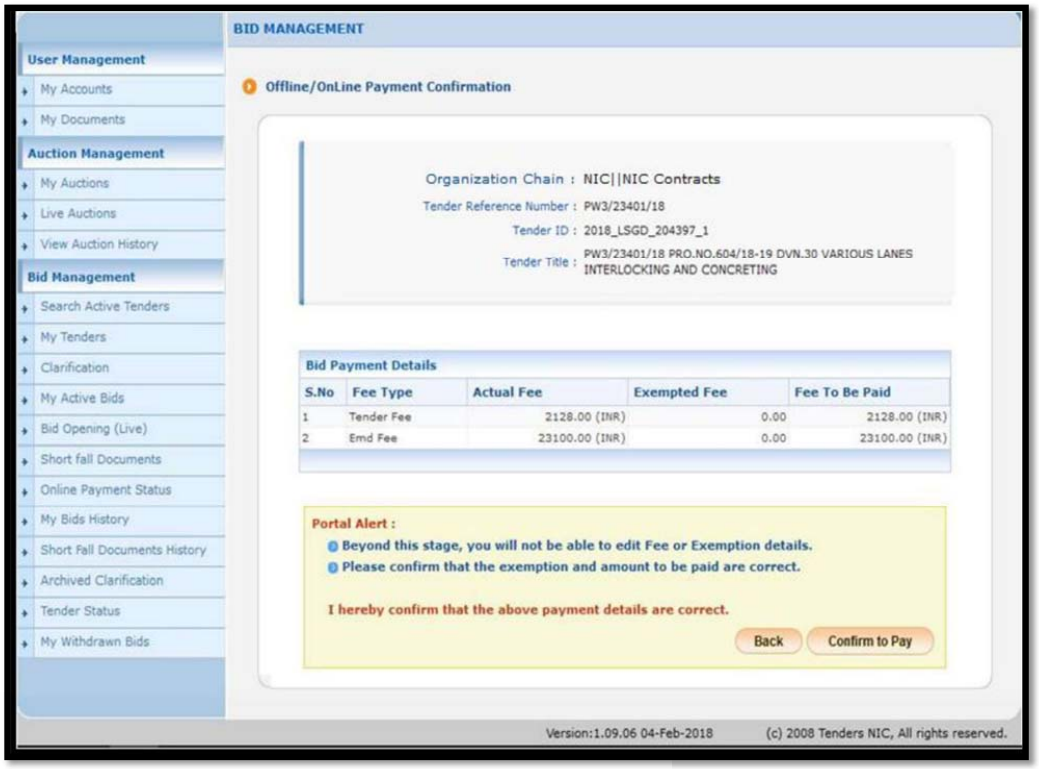


Step 1) Click **"Pay Online"** when you reach below page while Online Bid Submission.



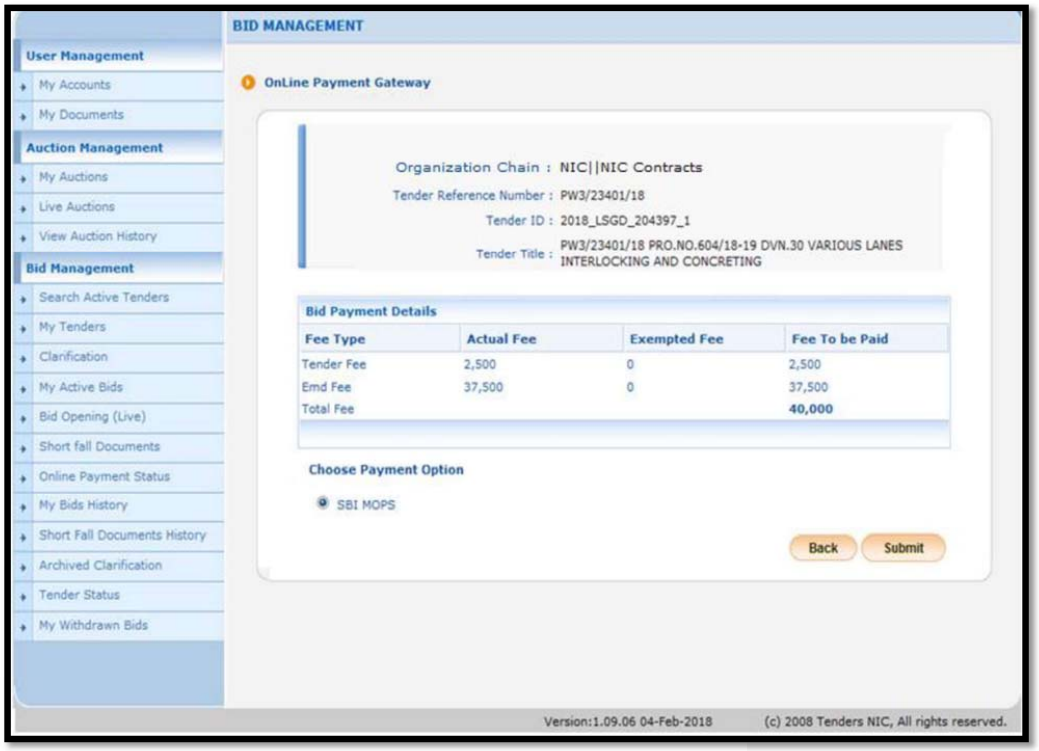
Step 2) Click **"Confirm to Pay"** to proceed with the payment gateway, as below.

Note: *Please ensure that you have availed Tender Fee / EMD Exemption, if eligible. Further, there would not be any provision to change back, under any circumstances.*

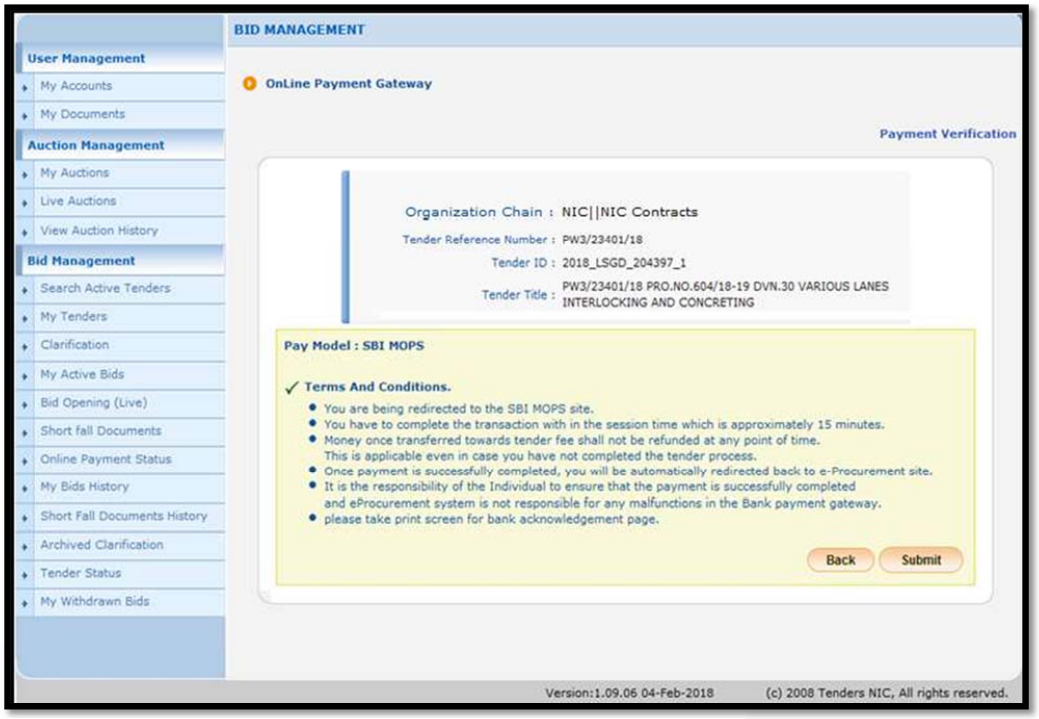


Step3) Verify that the Tender fee and EMD shown are correct, as per tender document. Then, select the payment option **SBI MOPS** and Submit, as below.

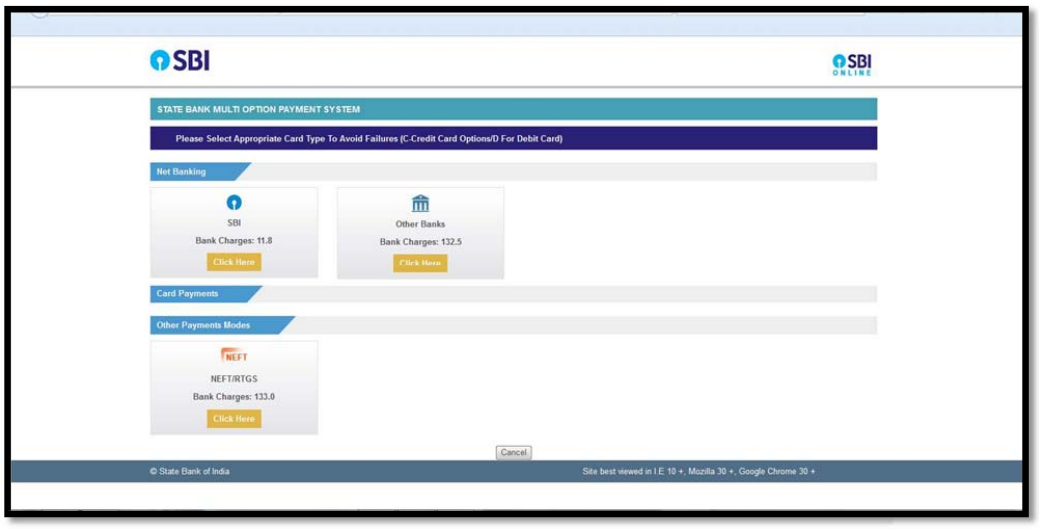
Note: *In case of any mismatch in tender payments, with reference to tender documents, please contact TIA for clarifications.*



Step 4) Check and Follow the **Terms and Conditions**, and then **Submit**, as below.



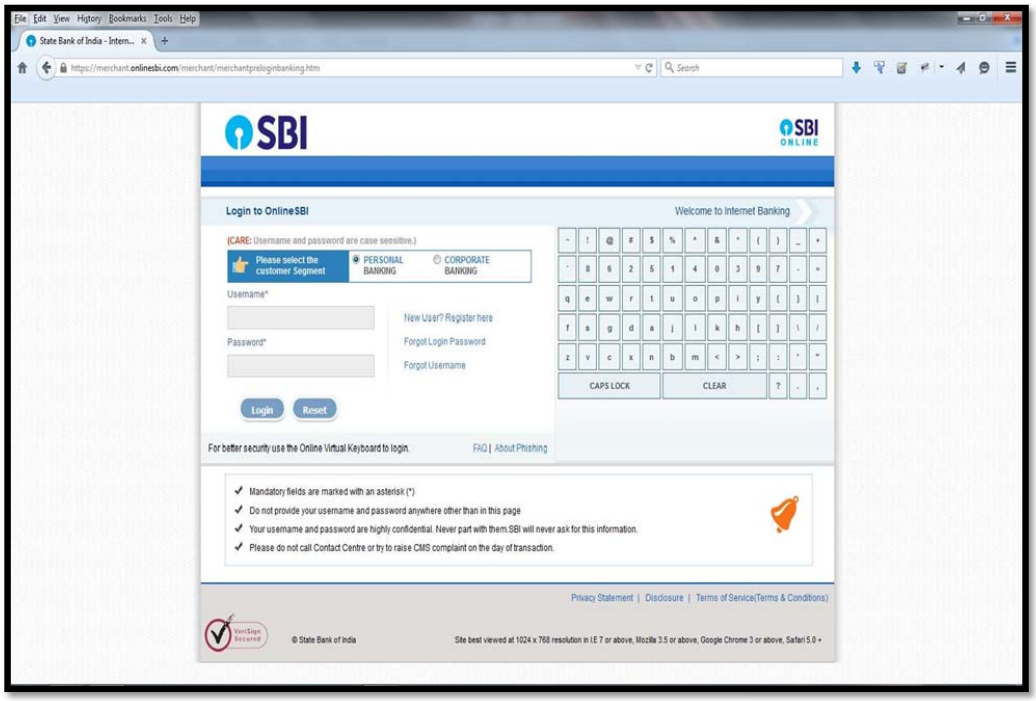
Step 5) Bidders may choose the type of transaction and proceed for payment.



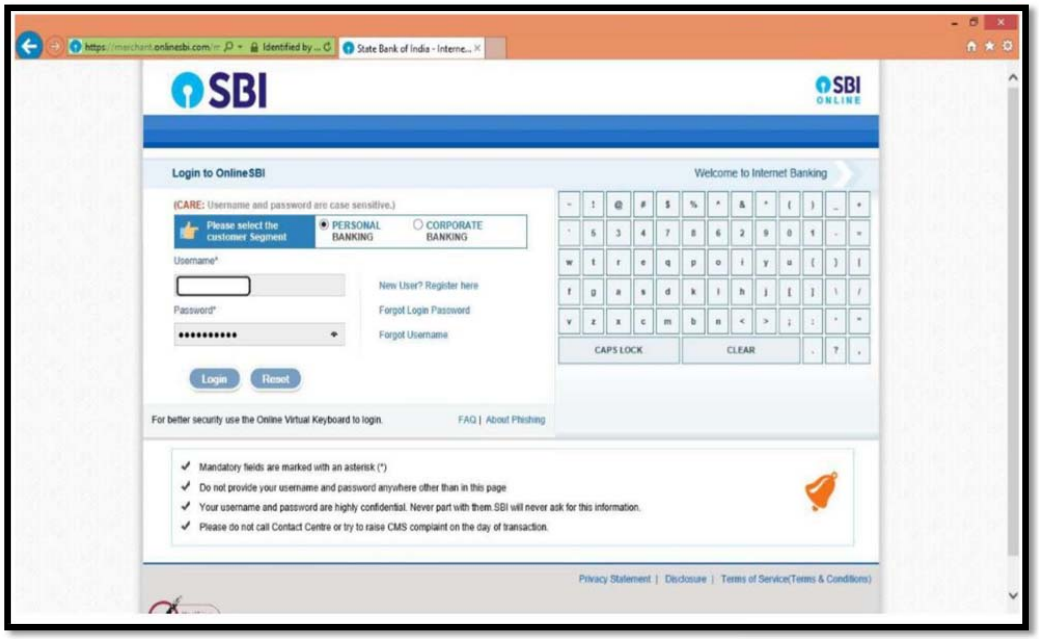
Step 6) Once the Payment type is selected it navigates to the respectivelanding page.

a) SBI

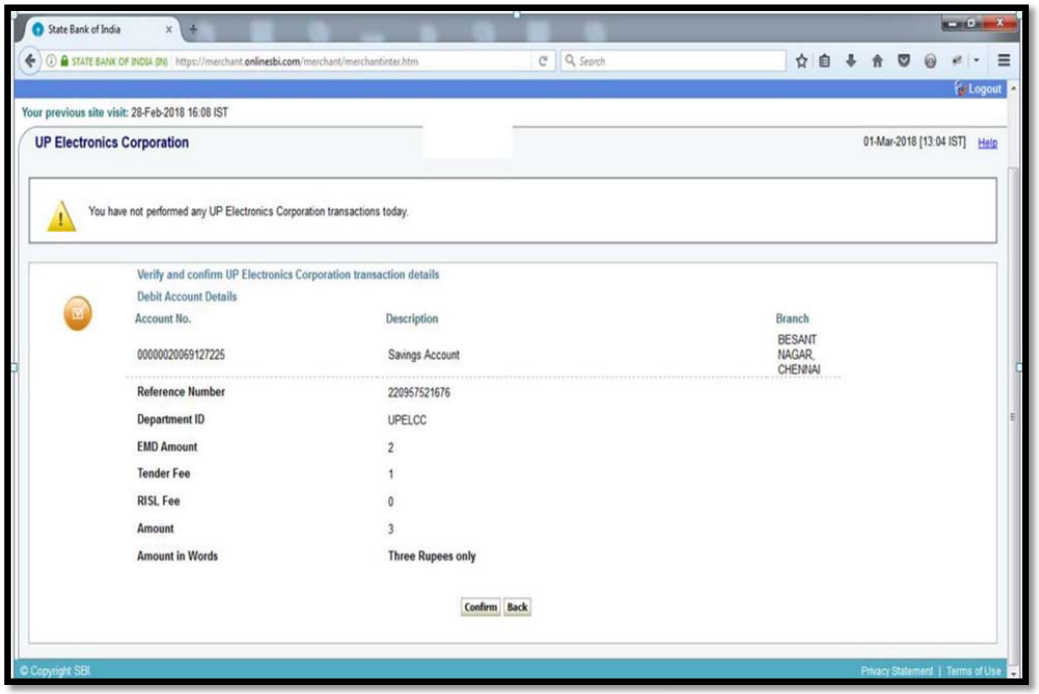
i. Bidders with SBI account may click **SBI** option to proceed to its Net Banking Page

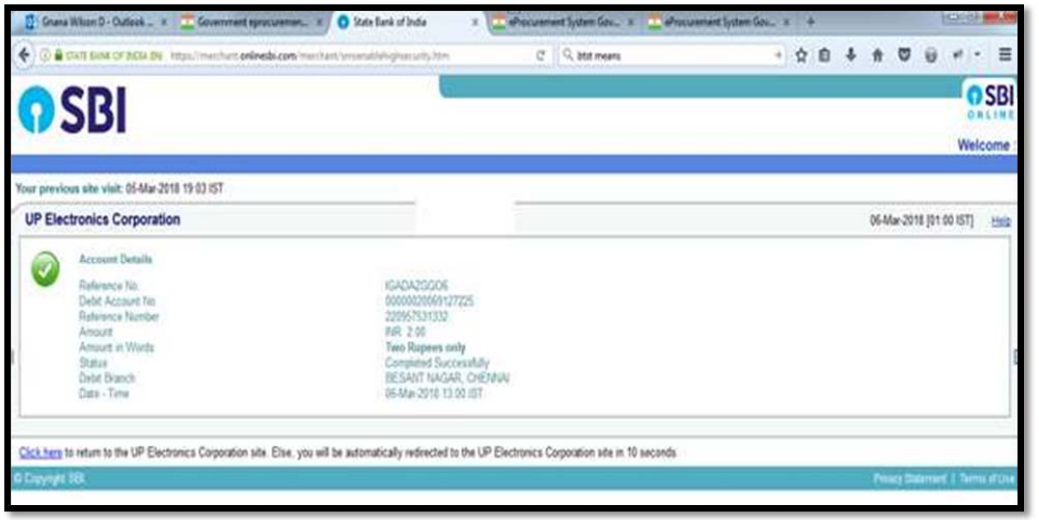


ii. Bidders may enter SBI Net banking user ID and Password and Click on **Login** to proceed.



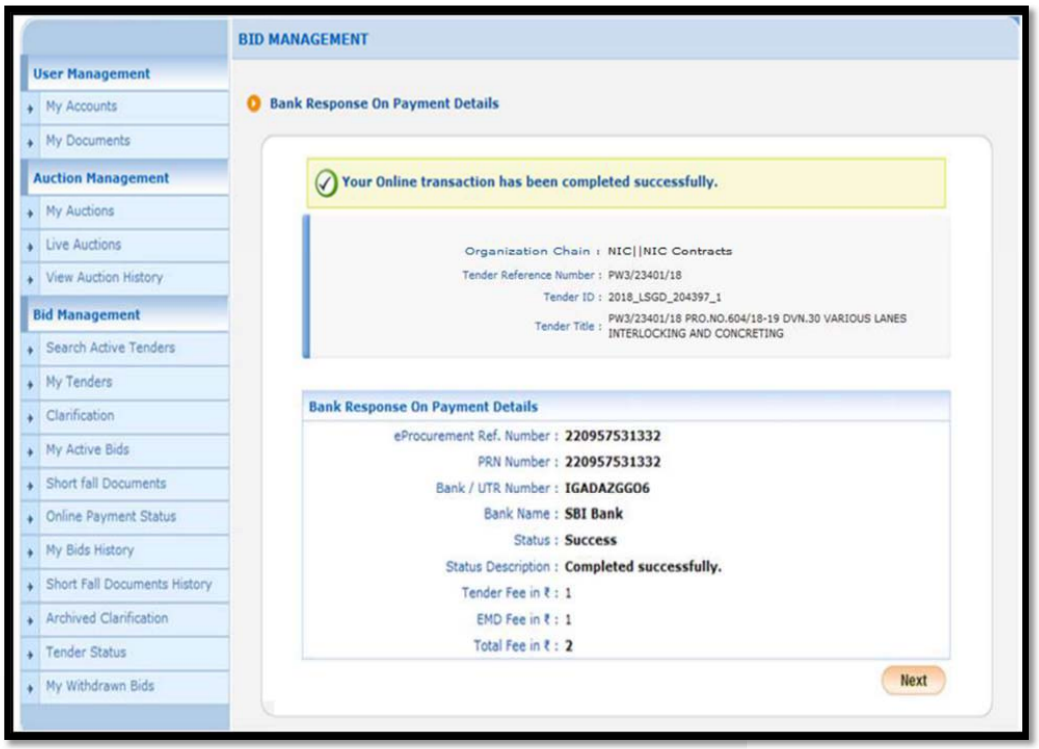
iii. Please ensure that your account has sufficient balance, before proceeding further. After checking the same, Click **Confirm** button as below, to transfer payment. After account debit, MOPS gateway will automatically re-direct to the eProcurement System, with the Success transaction.



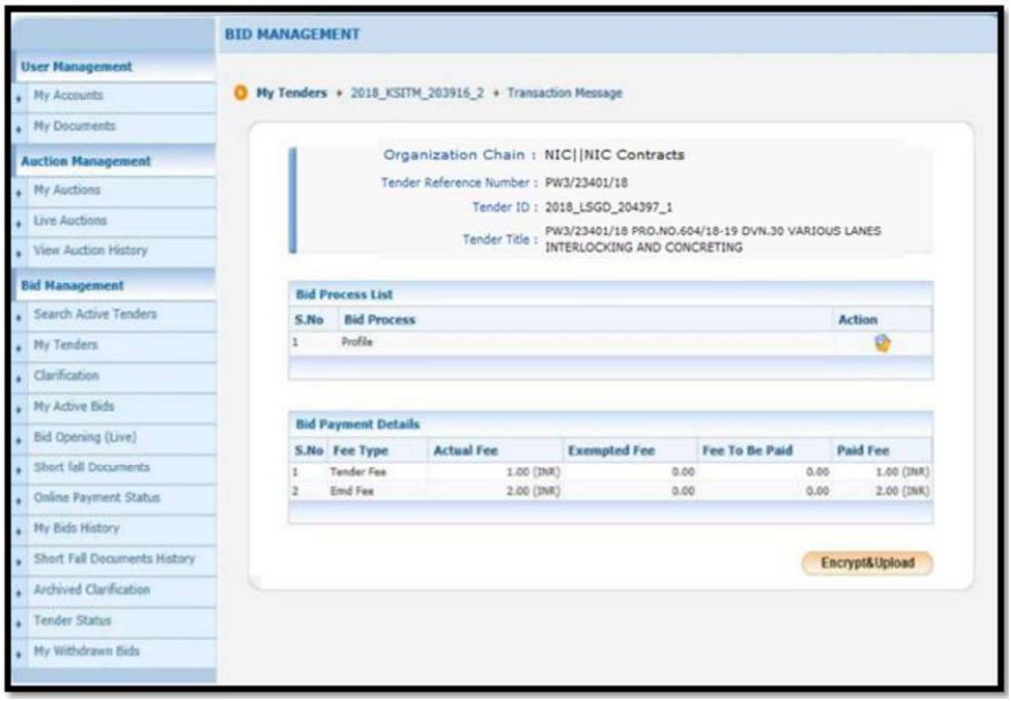


iv. As in below, you will receive bank response immediately by verifying the payment status, whether **Success** or not. In case, payment was debited from account and further, **Payment Failure** is shown, immediately contact the eProcurement helpdesk, for resolution, beforetender closing time.

Click ***Next*** to go to Bid Preparation details, as in screenshot.

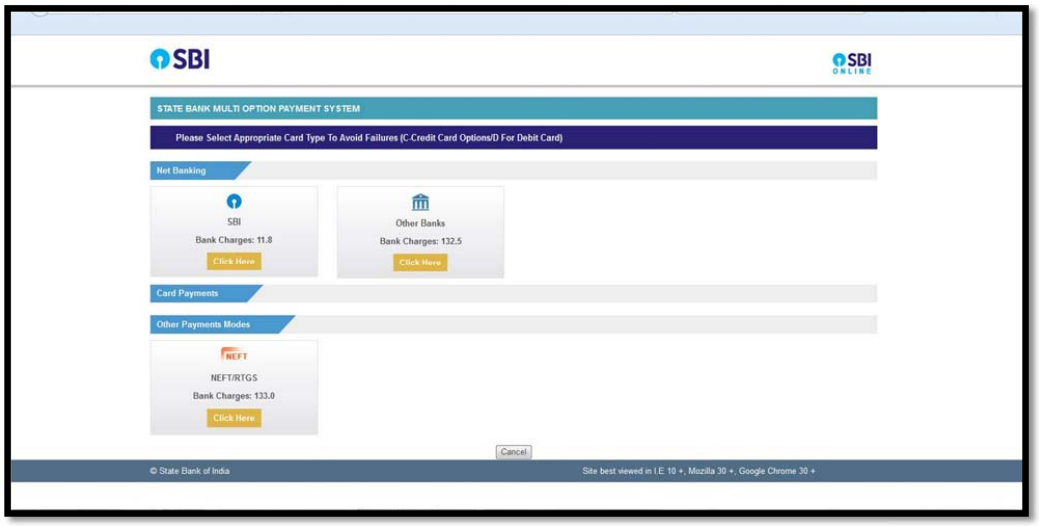


v. Please ensure that the **Pay Online** option is not shown after successful payment, as below, for confirmation. From here, you may proceed with **Encrypt and Upload** to upload tender documents, and further submission process.

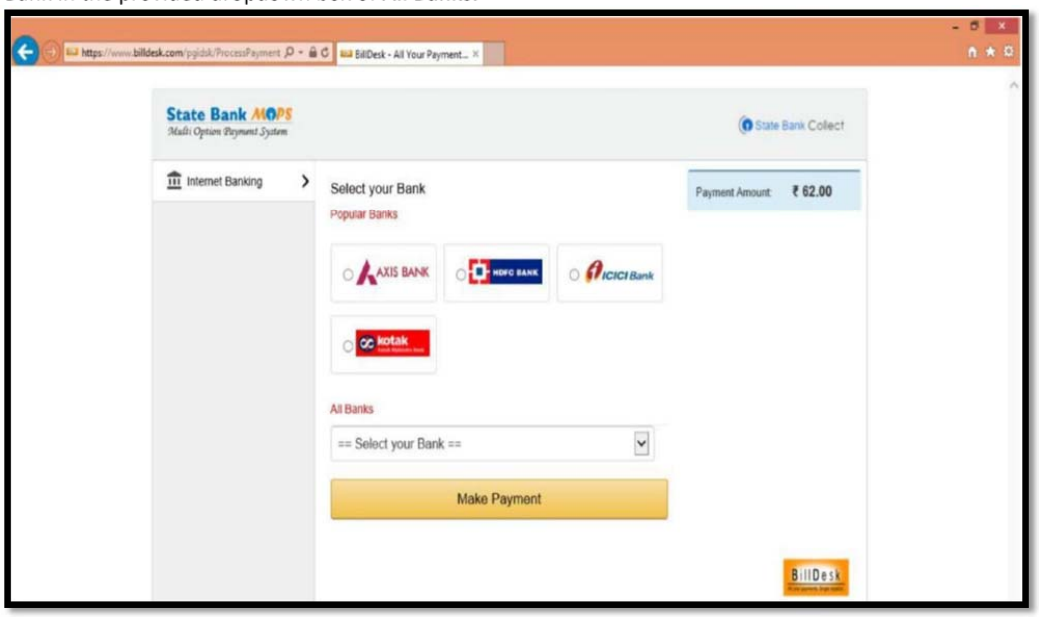


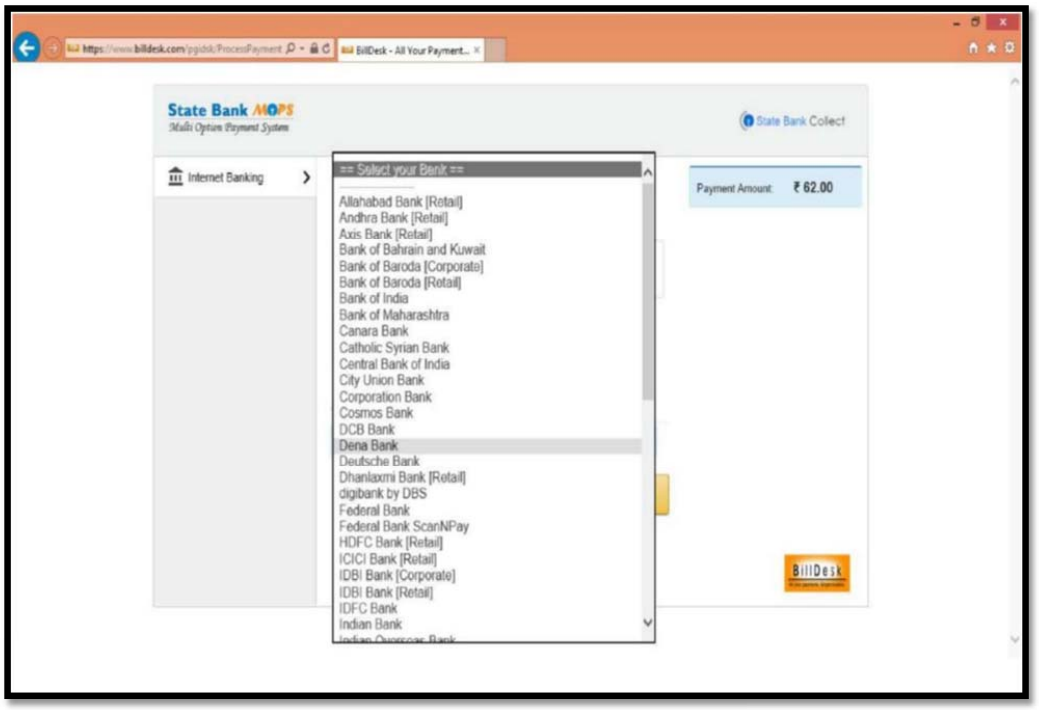
b) OTHER BANKS :

i. Bidders with other bank account may click **Other Banks** option to proceed to SBI Net Banking Page

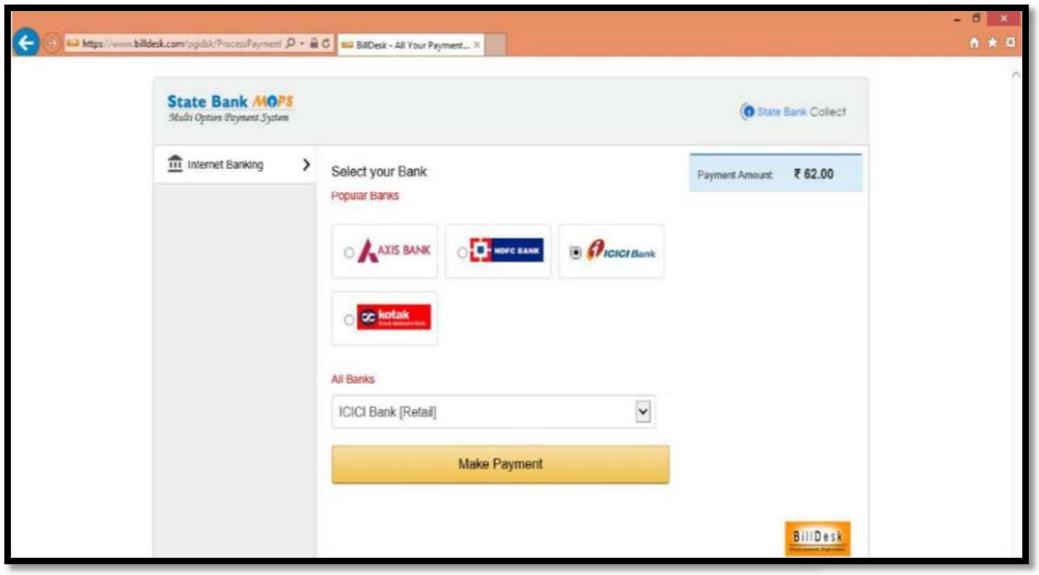


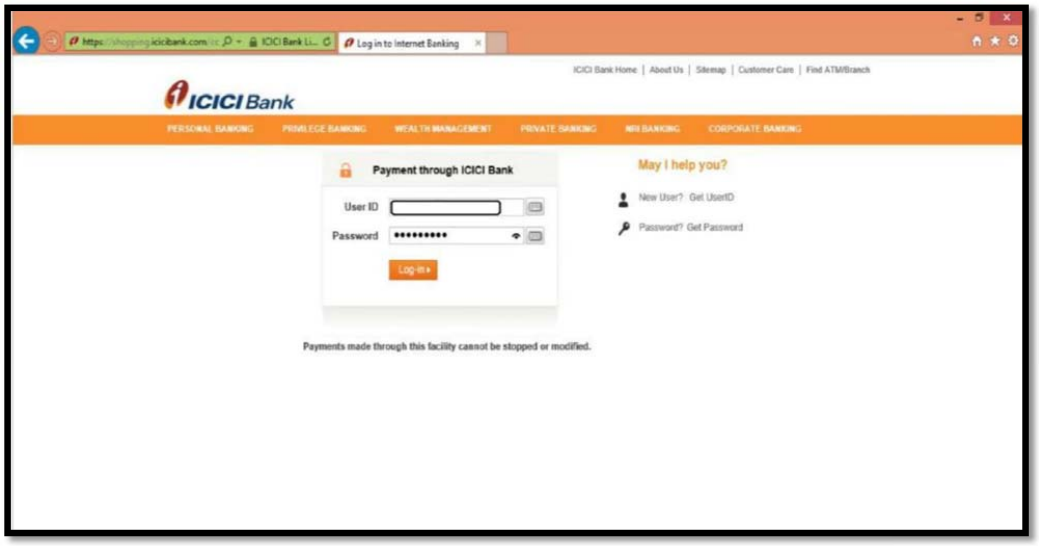
You may select the appropriate Bank from selection page. As an example, we are proceeding with ICICI Bank in the provided dropdown box of **All Banks.**

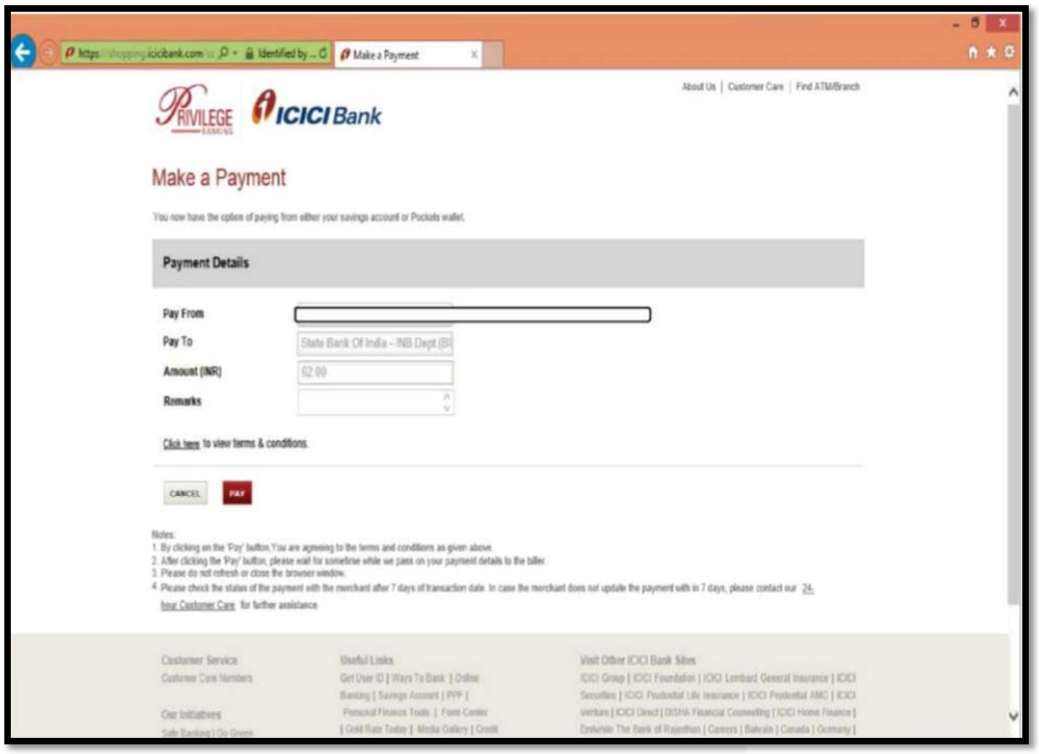


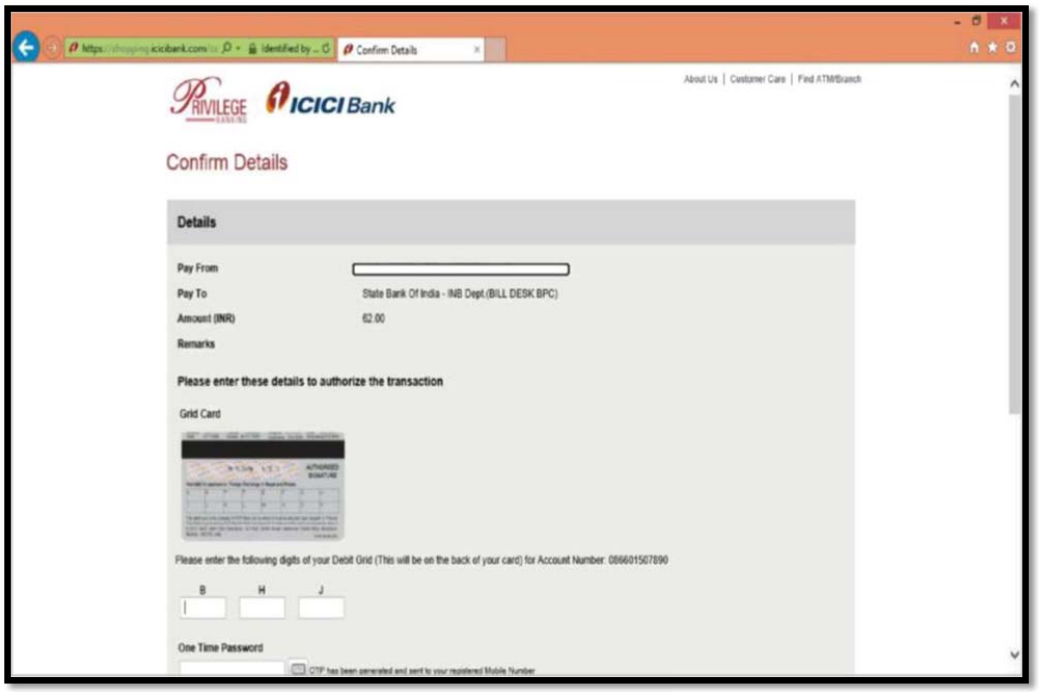

State Bank MOPS
Multi Option Payment System
State Bank Collect
Internet Banking
== Select your Bank ==
Allahabad Bank [Retail]
Andhra Bank [Retail]
Axis Bank [Retail]
Bank of Bahrain and Kuwait
Bank of Baroda [Corporate]
Bank of Baroda [Retail]
Bank of India
Bank of Maharashtra
Canara Bank
Catholic Syrian Bank
Central Bank of India
City Union Bank
Corporation Bank
Cosmos Bank
DCB Bank
Dena Bank
Deutsche Bank
Dhanlaxmi Bank [Retail]
digibank by DBS
Federal Bank
Federal Bank ScanNPay
HDFC Bank [Retail]
ICICI Bank [Retail]
IDBI Bank [Corporate]
IDBI Bank [Retail]
IDFC Bank
Indian Bank
Payment Amount: ₹ 62.00
BillDesk

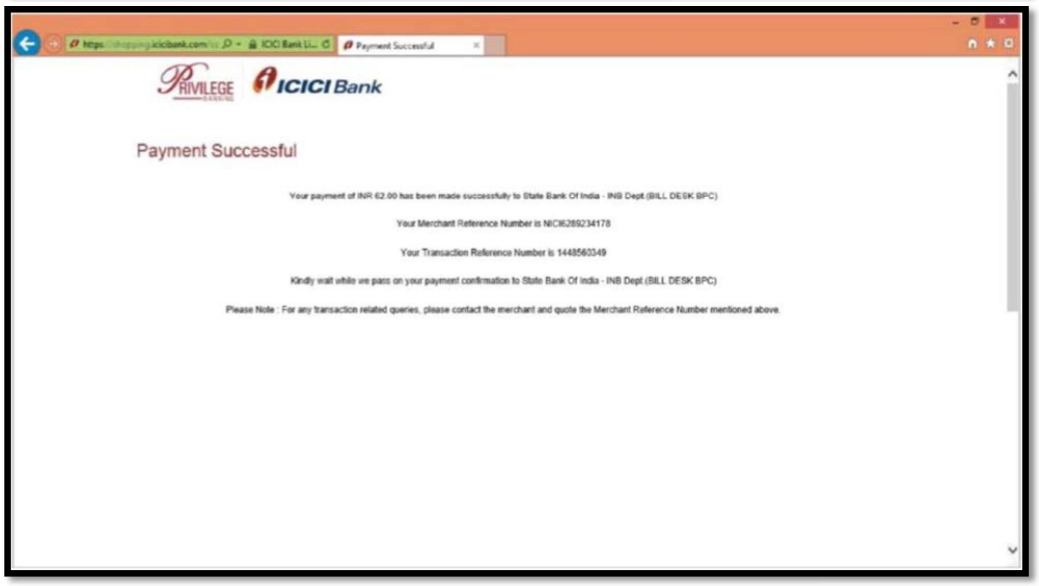
ii. After selecting ICICI Retail Banking, Click **Make Payment** Button to proceed to its internet banking page. Further steps may depend on the Bank Procedure.



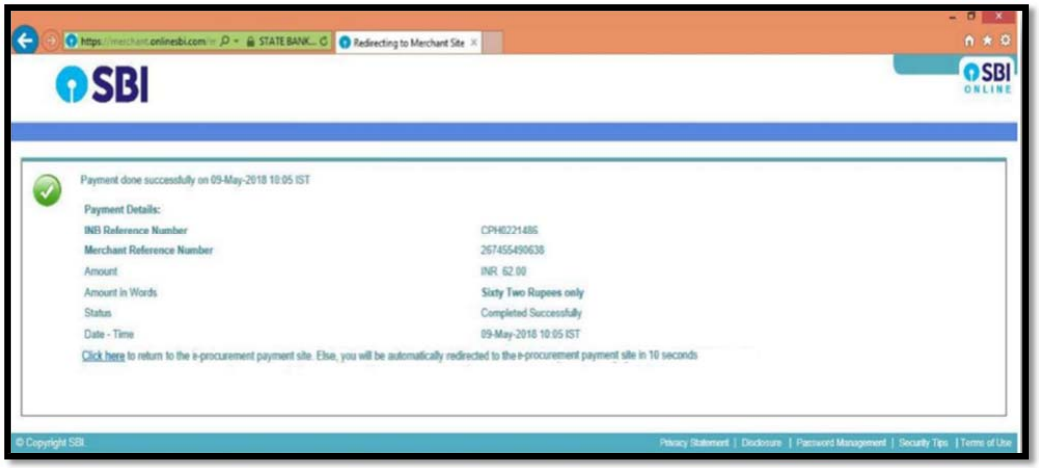



Make a Payment
About Us | Customer Care | Find ATM/Branch
Make a Payment
You now have the option of paying from either your savings account or Pockets wallet.
Payment Details
Pay From
Pay To
Amount (INR)
Remarks
Click here to view terms & conditions.
CANCEL
PAY
Notes:
1. By clicking on the 'Pay' button,You are agreeing to the terms and conditions as given above.
2. After clicking the 'Pay' button, please wait for sometime while we pass on your payment details to the biller.
3. Please do not refresh or close the browser window.
4. Please check the status of the payment with the merchant after 7 days of transaction date. In case the merchant does not update the payment with in 7 days, please contact our 24 hour Customer Care for further assistance.


Confirm Details
ICICI Bank
Confirm Details
Details
Pay From
Pay To
State Bank Of India - INB Dept.(BILL DESK BPC)
Amount (INR)
62.00
Remarks
Please enter these details to authorize the transaction
Grid Card
Please enter the following digits of your Debit Grid (This will be on the back of your card) for Account Number: 08660150789O
B
H
J
One Time Password

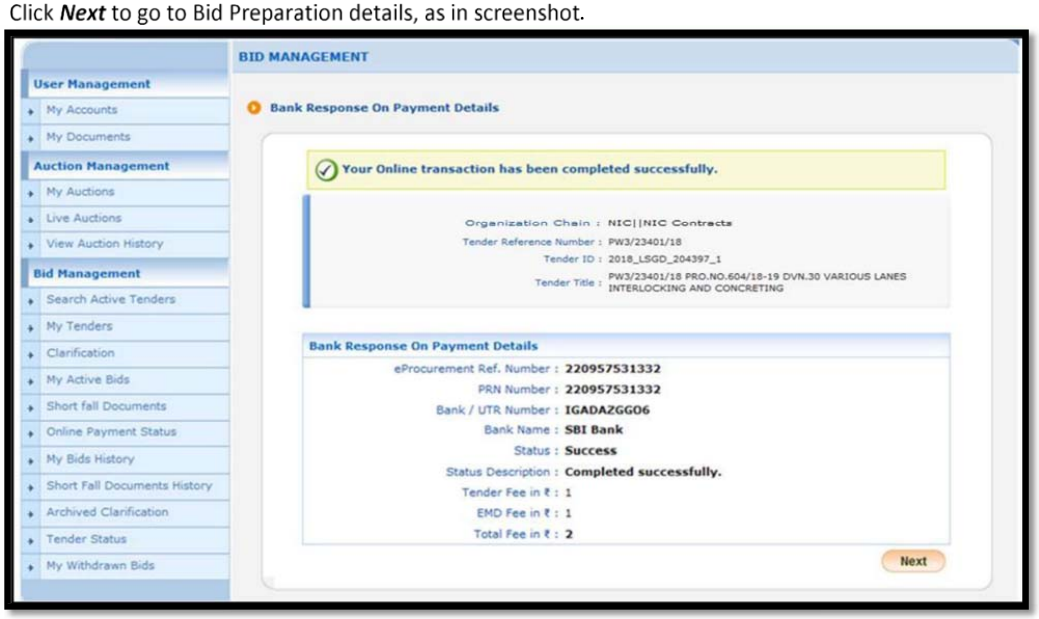

Payment Successful
ICICI Bank
Payment Successful
Your payment of INR 62.00 has been made successfully to State Bank Of India - INB Dept.(BILL DESK BPC)
Your Merchant Reference Number is NIC08289234178
Your Transaction Reference Number is 1448560349
Kindly wait while we pass on your payment confirmation to State Bank Of India - INB Dept.(BILL DESK BPC)
Please Note : For any transaction related queries, please contact the merchant and quote the Merchant Reference Number mentioned above.

iii. After, successful payment, system will direct you to payment confirmation page.

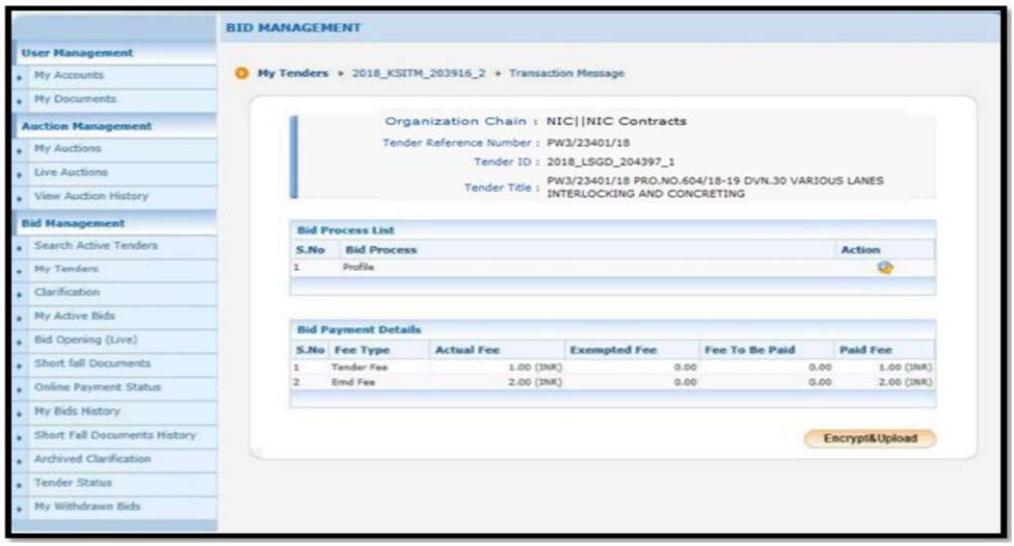


iv. As in below, you will receive bank response immediately by verifying the payment status, whether Success or not. In case, payment was debited from account and further, **Payment Failure** is shown, immediately contact the eProcurement helpdesk, for resolution, before tender closing time.

Click ***Next*** to go to Bid Preparation details, as in screenshot.

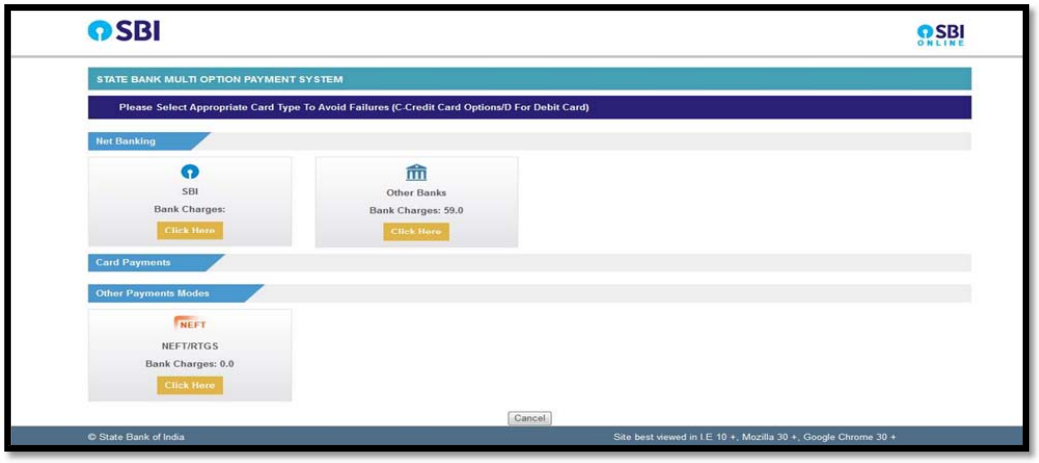


v. Please ensure that the **Pay Online** option is not shown after successful payment, as below, for confirmation. From here, you may proceed with **Encrypt and Upload** to upload tender documents, and further submission process.

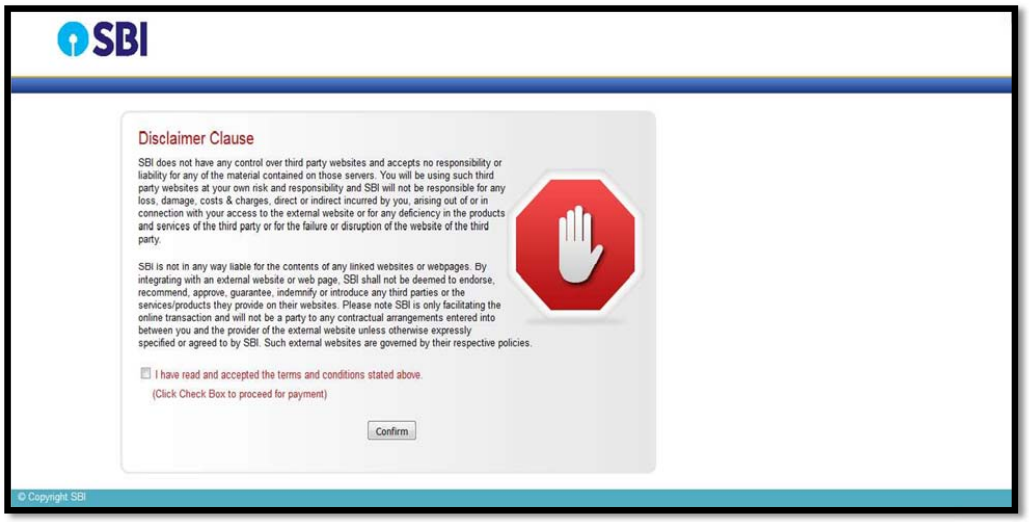


C) NEFT/RTGS

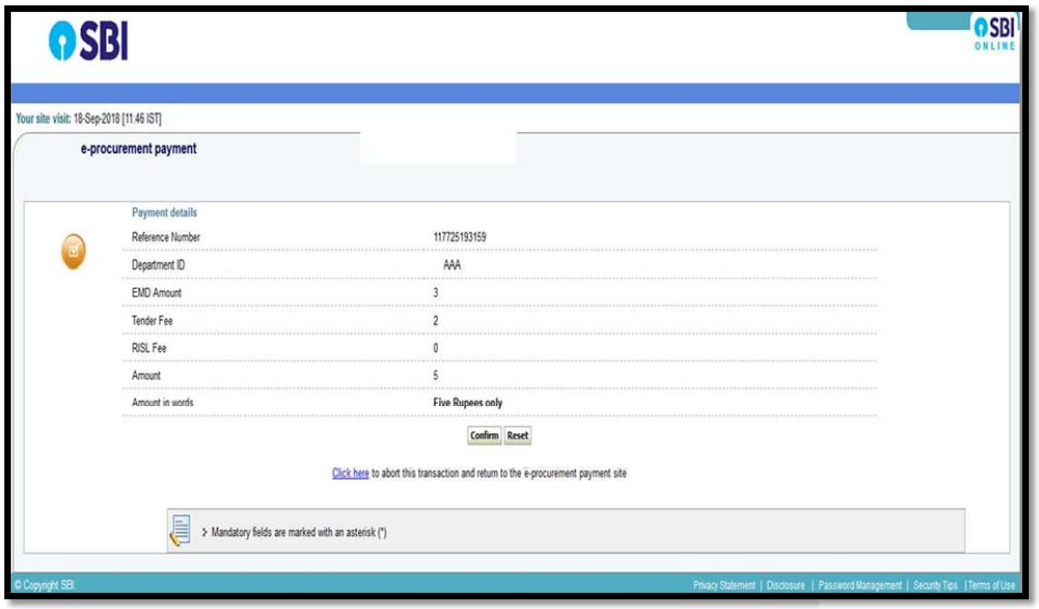
(i) Bidders may choose the type of transaction and proceed for payment.



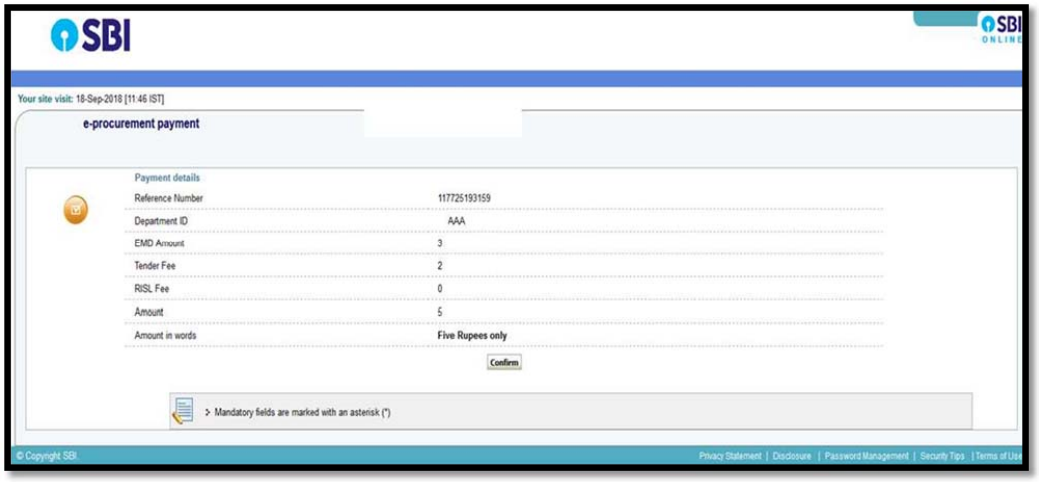
(ii) Please click the check Box to proceed to the payment and click on the Confirm Button.



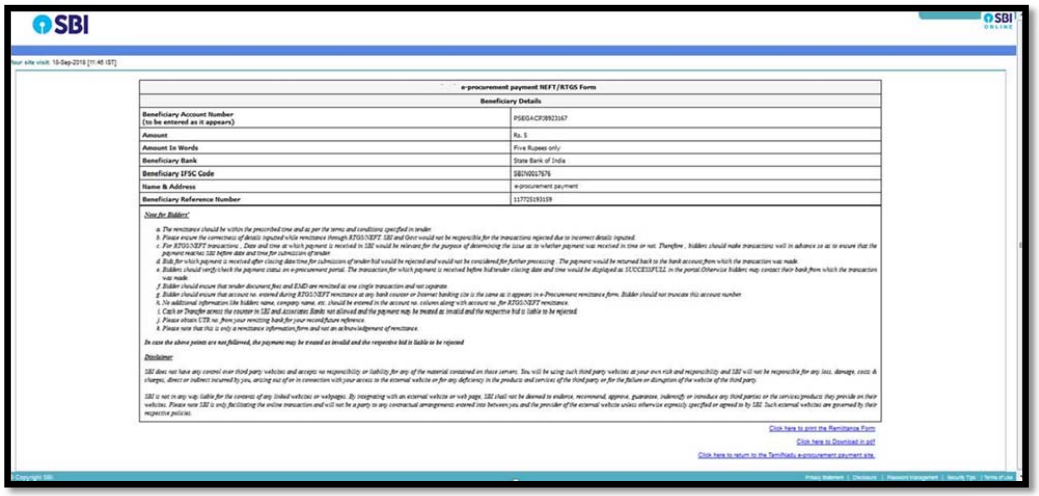
(iii) Please ensure that your account has sufficient balance, before proceeding further. After checking the same, Click **Confirm** button as below, to transfer payment.



(iv) Click **Confirm** button as below, to transfer payment.



(v) The challan is generated after successful transaction.



(vi) The Downloaded challan of the e-procurement RTGS/NEFT Remittance Information

e-procurement payment RTGS/NEFT Remittance Information Form
Beneficiary Details

Beneficiary Details	
Beneficiary Account Number (to be entered as it appears)	PSEGACPJ8923167
Amount	Rs. 5
Amount In Words	Five Rupees only
Beneficiary Bank	State Bank of India
Beneficiary IFSC Code	SBIN0017676
Name and Address	e-procurement payment
Beneficiary Reference No	117725193159

Instructions for remitting Bank:

a. *This form is valid for remittance through non-SBI branches.*
b. *Beneficiary account no. is alpha-numeric and case sensitive. It should be entered as it appears above.*
c. *Amount to be remitted should not be higher or lesser and should be the same as shown above.*

Note for Bidders:

a. *Bidder should ensure that account no. entered during RTGS/NEFT remittance at any bank counter or Internet banking site is the same as it appears in this remittance form. Bidder should not truncate or add any other detail to the above account number.*
b. *No additional information like bidder name, company name, etc. should be entered in the account no. column along with account no. for RTGS/NEFT remittance.*
c. *Account to Account transfers or Cash payments are not allowed and are invalid mode of payments. Hence, this remittance form is to be used only for RTGS or NEFT payment*
d. *Bidder should ensure that tender document fees and EMD are remitted as one single transaction and not separate. The remittance should be within the prescribed time and as per the terms and conditions specified in tender.*
e. *Please ensure the correctness of details inputted while remittance through RTGS/NEFT. Please also ensure that your banker keys in the Account Number (which is case sensitive) as displayed in this form. SBI and Merchant*
f. *For RTGS*
the purpos
should ma
time for submission of tender.
g. *Bids for which Payment is received after closing date/time for submission of tender/bid would be rejected*

1 / 1

AIRPORTS AUTHORITY OF INDIA
General Guidelines for Bidders

1. Item Rate e-tenders are invited through the e-tendering CPP Portal by Senior Manager (Engg. - Civil) (Bid Manager), Airports Authority of India, O/o ED (Engg.)-ER, 2nd Floor, Old R. D. Building, Safdarjung Airport, New Delhi – 110003, on behalf of Chairman, AAI from the eligible contractors for the work of **"Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft. SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)"** at an estimated cost of **Rs. 33.19 Crores (excluding GST)** with completion period of **Eleven (11) months including 02 month considered for rain.**

2. The Tenders shall be in the prescribed Form are invited in two bid system:
   i) 1st Bid Envelope-I : Tender processing fee, EMD, Technical Bid and Pre-qualification.
   ii) 2nd Bid Envelope-II : Price Bid.

3. Not more than one Tender shall be submitted by a contractor or by a firm. No two or more concerns in which an individual is interested, as Proprietor and/ or partner shall tender for the execution of the same works. If they do so, all such Tenders shall be liable to be rejected.

4. The Accepting Authority as mentioned in **Schedule "F"** shall be the Accepting Officer hereinafter, referred to as such for the purpose of this contract.

5. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorizing him to do so. Such power of attorney to be uploaded in Envelope-I, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.

6. Tender documents can be downloaded from the CPP e-tendering portal. Tender processing fee of **₹ 5,900/- (i/c GST)** – Non-Refundable is to be paid online through Payment Gateway on CPP Portal. The last date of submission of bid is as mentioned in Critical Data Sheet of Notice Inviting Tender.

7. Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in

general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents.

8. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by Airports Authority of India, local conditions and other factors having a bearing on the execution of the work. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed.

9. All rates shall be quoted in the **respective Section** in CPP e-tender Portal (**Price Bid i.e. Envelope-II).**

10. As this tender is an Item Rate Tender, rates for all items quoted shall only be considered. Tenderers which propose any alteration in the works specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates will be summarily rejected. In case above conditions are found violated, the tender shall be rejected and AAI shall, without prejudice to any other remedy, be at liberty to debar/ legal action against the agency.

11. Tenders shall be received through CPP e-tendering portal as per the dates in critical data sheet of NIT.

12. The tenderer should study the complete tender document. In order to facilitate AAI to prepare responses, the interested tenderers are requested to submit their queries (if any), in CPP e-tender portal only, as per time schedule specified in NIT. The tenderers queries shall be replied through e-portal only.

13. **Earnest Money Deposit (EMD)/ Tender Processing Fee**:

13.1 Tender processing fee of **₹ 5,900/-** (i/c GST) Non-refundable will be required to be paid online on CPP Portal only.

Earnest Money Deposit (EMD) of **₹ 99,60,000/-** will be required to be paid online on CPP Portal. Contractors may have the option to submit EMD in the form of Insurance Surety Bonds or Bank Guarantee (BG) -paper form from a Nationalized or any scheduled bank but not from Co-Operative or Gramin/ Rural bank (scheduled or Non-scheduled banks)

The Bank Guarantee (PBG/BG-SD/FBG) in accordance with the bank details as:

CORPORATE NAME:	AIRPORTS AUTHORITY OF INDIA
BANK NAME:	ICICI BANK
IFSC CODE:	ICIC0000007
BG ADVISING MESSAGE:	IFN760COV (BG ISSUE) IFN767COV (BG AMENDMENT)
UNIQUE IDENTIFIER CODE (7037):	AAICORHQ

Scanned copy of Insurance Surety Bond (as per **Appendix-IA)** / BG (as per **Appendix-IB)** against EMD with copy of the SFMS (Structured Financial Messaging System) BG confirmation message sent by the BG issuing bank to ICICI bank, if EMD not paid online on CPP Portal along with letter of undertaking (**Appendix– XIA**).

13.2 The settlement of the tender processing Fee, as per case will be executed to bidder through online mode.

13.3 State Bank of India (SBI) has been authorized as Nodal Bank and its payment gateway has been integrated/ mapped with CPP Portal for the collection of Tender Processing Fee through e-procurement portal from various bidders participating in e-Tendering/ e-Procurement.

14. **Power of attorney/ authorization for signing tender:**

a) Only the Power of Attorney/ Authorization holder of the tenderer on whose name the tender has been uploaded shall sign the Tender documents.

b) The name and designation of the person or persons of the company who is authorized to sign shall be clearly indicated in the authority letter.

c) In the event of the tender submitted by a firm, it must be signed by a person holding a power-of-attorney to sign the tender document. Such power of attorney to be uploaded in Envelope-I, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.

15. Notification of Award of contract will be made in writing to the successful bidder by the Accepting Authority or his representative. The contract will normally be awarded to the qualified and responsive Bidder offering lowest evaluated bid in conformity with the requirements of the specifications and contract documents and the Accepting Authority shall be the sole judge in this regard. The Accepting Authority does not bind himself to accept the lowest or, any tender or to give any reason for his decision. **A responsive bidder is one who submits priced Tender and accepts all terms and conditions of the specifications and contract documents. A Tenderer**

shall submit a responsive bid, failing which his Tender will be liable to be rejected.

16. The Accepting Authority does not bind itself to accept lowest tender or any tender and reserves to himself the right of accepting the whole or any part of the tender and tenderer shall be bound to perform the same at his quoted rates. No claim whatsoever will be entertained on this account.

17. The Tenderer shall not be permitted to tender for works in Airports Authority of India Engineering Department, responsible for award and execution of contracts, in which his near relative is posted as Manager (Finance & Accounts) or Sr. Officer or as an engineer in any capacity. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in Airports Authority of India. Any breach of this condition by the contractor would render him liable to be debarred from Tendering for next 2 years.

18. The contractors shall give a list of AAI employees related to him.

19. No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of Airports Authority of India/Govt. of India is allowed to work as a contractor for a period of one years of his retirement from Airports Authority of India/ Government service, without the prior permission of Airports of India/Govt. of India. The contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Airports Authority of India/Govt. of India as aforesaid before submission of the Tender or engagement in the contractor's service.

20. **The Tender for the work shall remain open for acceptance for a period of Ninety days (90) days from the date of submission of bids i/c extension, if any. If any Tenderer withdraws his tender before the said period or makes any modifications in the terms and conditions of the Tender which are not acceptable to the Department, then Airports Authority of India shall without prejudice to any other right or remedy, be at liberty to debar/ legal action against agency.**

21. **The site for the work shall be made available as per NOTAM schedule (if applicable) so that day to day operations of flights schedule are not affected. Agencies are advised to visit the site in detail, study the various working parameters of the particular airport etc. in detail before submission of the bid.**

22. **On acceptance of the Tender, the name of the accredited representative(s) of the contractor who would be responsible for**

taking instructions from the Engineer-in-Charge shall be communicated to the Engineer-in-Charge within 10 days of acceptance of tender.

23. A tenderer shall submit the tender which satisfies each and every condition laid down in this notice failing which the Tender will be liable to be rejected. Also, if the credential submitted by the firm found to be incorrect/ false or have some discrepancy which disqualifies the firm then the AAI shall take the following action:
    a) Forfeit the entire amount of EMD submitted by the tenderer.
    b) Debar the firm for a period up to two years to tender in AAI in any name/ style.

24. **Taxes**
    i) All tendered rates should be inclusive of all taxes, duties, cess, fee, royalty charges etc. levied under any statute but exclusive of GST (Goods & Service Tax), ESI & PF. GST shall be paid to bidder for any taxable supply/ services against a valid Tax invoice.
    ii) An undertaking should be submitted for registration under GST and compliance of GST provisions.
    iii) In case of non-compliance of GST provisions and blockage of any input credit the bidder shall be responsible to indemnify AAI.

25. a.) If any further tax or levy is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pay such taxes/ levies, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Engineer-In-Charge (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.

    b.) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of Airports Authority of India and/ or Engineer-In-Charge and further shall furnish such other information/ document as the Engineer-In-Charge may require from time to time.

    c.) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy, pursuant to the Constitution (46th amendment) Act 1982, give a written notice thereof to the Engineer-In-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

26. MODE OF SUBMISSION OF TENDERS:
Tender for the present work shall be submitted online through e-tendering portal in two bids (i.e. Envelope I & II) system as detailed in NIT.

Tenders shall be processed as below

Envelope-I: Containing Tender processing fee, EMD, Technical bid and Pre-Qualification Documents (Uploaded by the contractors/ firms) shall be opened on as mentioned in **CRITICAL DATA SHEET.** The intimation regarding acceptance/ rejection of their bids will be intimated to the contractors / firms through CPP e-tendering portal.

Envelope-II: Containing financial bid of the tenderers found to be meeting the technical criteria and qualifying requirements shall be opened on date & time mentioned in CRITICAL DATA SHEET. (In case the date and time for opening of Envelope-II (Financial bid) is required to be changed, the same shall be intimated through CPP Portal).
Note: Once the bidder has submitted the digitally signed file of Unconditional Acceptance of AAI's Tender Conditions, he is not permitted to upload any additional file or put any remark(s)/ conditions(s).

AAI reserves the right to accept or reject any or all applications without assigning any reasons. AAI also reserves the right to call off tender process at any stage without assigning any reason.

Clarifications: If the bidder has any query related to the Tender Document of the work they should use 'Clarification' tab in CPP-tendering portal to seek clarifications. No other means of communication in this regard shall be entertained. Last date and time for raising query shall be as stipulated in NIT.

If any clarification is needed by AAI from the bidder about the deficiency in their uploaded documents in Envelope-I, they will be asked to provide it though CPP-tendering portal. The bidder shall upload the requisite clarification/documents within specified time by AAI failing which tender will be liable for rejection.

In case above conditions are found violated, the tender shall be rejected.

27. COMPARISON AND EVALUATION OF TENDER

a) Prior to detailed evaluation, AAI will determine the substantial responsiveness of Tender document. A substantial responsive Tender is one, which confirms to all the terms and conditions of the Tender.

b) A tender is determined as not responsive, if tender is submitted incomplete, annexures are not filled up, unconditional acceptance letter minimum wages affidavit, integrity pact and power of attorney not found in proper form etc. etc. as described above such tenders are liable to be rejected by AAI.

c) If the tenderer deliberately gives wrong information or suppress any information in his Tender, AAI reserves the right to reject such tender at any stage or to cancel the contract, if awarded, and tenderer is liable to be banned from doing business with AAI, absolutely, in addition to any other appropriate/legal action.

Only those tenderers whose Technical Bid documents are acceptable to AAI will be examined and their techno-commercial bid shall be evaluated to determine whether they are complete, meets tender requirements, free from computational errors, whether the data have been properly filled up, and whether the requisite documents as detailed have been submitted in conformity to the Tender specifications, drawings and conditions.

28. Price Bid: -

The Price e-Bid through CPP e-portal.

a) Tenderer should download the 'Tender Document' file along with BOQ from the CPP e-tendering portal and upload the digitally signed BOQ file along with desired documents in Envelope-I.

b) Rates to be quoted in the column mentioned for rate only.

c) The offer from those contractors whose digitally signed required documents are not found in "Envelope-I" will not be considered and will stand rejected and Envelope-II (financial bid) of such contractors shall not be opened.

d) Price bid shall only be accepted in the desired format. No other format shall be accepted.

e) In case, the condition 28 (d) above is found violated, the tender shall be rejected.

29. REJECTION OF TENDER: -

a. Airports Authority of India reserves the right to reject all the tenders or any of the tender or any part of tender without assigning any reason.

b. AAI reserves the right at its sole discretion not to award any work under this tender. AAI shall not pay any costs or loss incurred by the tenderers in the preparation and submission of any requisite tender or technical proposal or to procure contract for any of the items described herein.

c. If the tenderer deliberately gives wrong information or suppress any information in his Tender, AAI reserves the right to reject such tender at any stage or to cancel the contract, if awarded, and to forfeit the Earnest Money, absolutely, in addition to any other appropriate/legal action.

d. Canvassing in any form in connection with the tenders is strictly prohibited and the tenders submitted by firms who resort to canvassing are liable for rejection.

e. Any deviation in the Tender submission procedure will be considered as non-responsive bid and liable to be rejected**.**

f. A Tenderer shall submit a responsive bid, failing which his Tender will be liable to be rejected.

g. Tender in which any of the particulars and prescribed information are missing or are incomplete, in any respect and/or prescribed conditions are not fulfilled, shall be considered non-responsive and is liable to be rejected.

h. The tenderer is expected to examine the tender document including all instructions, forms, terms, specifications, drawings, etc. Failure to furnish all information required as per the tender documents or submission of a tender not substantially responsive to the tender document in any respect may result in the rejection of the tender.

i. A Tenderer shall submit the Tender which satisfies each and every condition laid down in this notice failing which the Tender will be liable to be rejected.

j Any tender not accompanied with EMD Performa in the prescribed form will be considered non-responsive and rejected.

30. This notice of Tender shall form part of the contract documents. The successful Tenderer/ contractor, on acceptance of his Tender by the Accepting Authority, **shall within 10-days from the date of award of work, sign the contract consisting of** Notice inviting Tenders, General conditions of contract, special/ additional condition, General and particular specifications, Tender conditions as issued at the time of invitation of Tender and acceptance thereof with any correspondence leading there to.

31. The tender for the work shall not be witnessed by a contractor or contractors who himself/ themselves has/have tendered or who may have tendered for the same work. Failure to observe this condition would render tender of the contractor tendering as well as witnessing the tender, liable to summarily rejection.

32. AAI shall be the sole judge in the matter of evaluating & accepting technical bids, Price bids and award of contract and decision of AAI shall be final & binding.

33. AAI reserve the right to verify the credential submitted by the agency at any stage (before or after the award of work) If at any stage, any information/ documents submitted by the applicant is found to be incorrect/ false or have some discrepancy which disqualifies the firm then AAI shall take the following action:

a. The agency shall be liable for debarment from tendering for a period up to two years in AAI in any name/ style, apart from any other appropriate contractual/ legal action.

34. <u>IMPLEMENTATION OF INTEGRITY PACT</u>

a) Signing of Integrity Pact is mandatory for every Bidder/ contractor in this procurement/ bid process, and scanned copy of same should be uploaded as specified in Tender document.

b) The Bidder/ contractor shall commit itself to ensure taking all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage as specified in Section 3 of the integrity pact.

c) Any breach of the aforesaid provisions by the bidder or any one employed by it or acting on its behalf (whether with or without the knowledge of the Bidder) shall entitle the authority to take all or any one of the actions as specified in Section 6 of the integrity pact.

The Independent External Monitor (IEM) for this work will be:

1. Shri Satish Chander, MES [Retd.] **A-1, 601, Windsor Avenue,** **Wanowrie, Pune - 411022** **Mobile no. 094172-56367** **Email** – satishchander.adg@gmail.com	**2. Shri P. R. Ravikumar, IRS [Retd.]** **Akshath, No.84, First Avenue,** **Kumaranasan Nagar, Elamkulam PO,** **Ernakulam, Kerala – 682020** **Mobile no. 085470-02410 & 088487-67105** **Email:** prravikumar@yahoo.com

d) The duties responsibilities and powers of IEM are detailed in section 8 of the IP Act.

e) Any query related to tender document or problem in e-bidding process should normally be addressed to bid manager as mentioned in **General Instruction for Online bid submission in para "Assistance to Bidders" on page IBS-1 to IBS-4 of tender document.**

No bid procedure related query shall be referred to Independent External Monitor (IEM).

f) Update with regard Integrity Pact may please be seen on AAI Website by following the access path www.aai.aero>Vigilance>Vigilance Events>Integrity Pact

g) The Consequence of Integrity Pact may be perused on the website. **http://www.aai.aero/**

35. Standard Printed Conditions

Standard printed conditions of the tenderer if any submitted along with the offer will not be accepted.

(Bid Manager)
Senior Manager (Engg. -Civil)
For and on behalf of
Airports Authority of India

PRE-QUALIFICATION PROFORMA – ENVELOPE-I

(To be filled & Uploaded by applicants along with tender documents.)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

(Tender ID: _____)

S. No.	Qualifying criterion	Supporting Document must have the following salient information which AAI would like to note	Enclosure Check-list	UDIN Number of Certificate (wherever applicable)
1.0	Details of Agency: Name and registered office address of the Applicant Contractor/ Firm	Name: Address: Telephone: Email:	Details to be filled. Copy uploaded: Yes / No	
2.0	Whether Bidder is Proprietary firm.			
3.0	Scanned copy of online receipt Tender Fee Submission.		Details to be filled. Copy uploaded: Yes / No	
4.0	Scanned copy of online receipt generated on deposition of EMD OR Scanned copy of Insurance Surety Bond (as per **Appendix-IA**) / BG against EMD (as per **Appendix-IB)** with copy of the SFMS (Structured Financial Messaging System) BG confirmation message sent by the BG issuing bank to ICICI bank, if EMD not paid online on CPP Portal along with letter of undertaking (as per **Appendix – XI-A**).		Details to be filled. Copy uploaded: Yes / No	

5.0	Scanned copy of Tender Acceptance Letter on Bidder's Letter Head. **(Annexure-1)**		Details to be filled. Copy uploaded: Yes / No	
6.0	a) Scanned copy of Permanent Account Number (PAN)		Copy of PAN uploaded: Yes/ No	
	b) Scanned copy of GST Registration Number		Copy of GST Registration No. Uploaded: Yes/ No	
7.0	Scanned copy of 'Undertaking' regarding Debarment/ Blacklisting / Restrainment on Bidder's Letter Head. **(Annexure 3).**		Copy uploaded: Yes/No	
8.0	Scanned copy of **Form- A** - details of similar works completed during last seven years supported with completion certificate issued by client		Details to be filled. Copy uploaded: Yes / No	
9.0	Scanned copy of **Form- B**-Financial Information (Annual Average Turnover).		Details to be filled. Copy uploaded: Yes / No	
10.0	Scanned copy of **Form- C** – Net Worth.		Copy uploaded: Yes/No	
11.0	Scanned copy of **Form-F**-Annual value of General Construction / Engineering Work.		Copy uploaded: Yes/No	
12.0	Scanned copy of Signed Integrity Pact as per **Appendix-XVIII** of GCC.		Copy uploaded: Yes/No	
13.0	Scanned copy of 'Undertaking' on Company's Letter to deploy sufficient plant and machinery **(Annexure-4)**		Copy uploaded: Yes/No	
14.0	Scanned copy of Authorization Letter/ Power of Attorney along with copy of Certificate of Incorporation of the	Name of Power of Attorney Holder: …… CIN No.: ……. Copy of Name of	Details to be filled. Copy uploaded: Yes / No	

	Company under Companies Act showing CIN/LLPIN/Name of Directors of the Company and copy of Board Resolution regarding Authority to assign Power of Attorney.	Directors of Company: …… Scanned copy of Board resolution regarding assigning of Power of Attorney: _____ Certificate of incorporation:		
15.0	Certificate from statutory cost auditor regarding requirement of local contents (**Annexure-8**)			
16.0	Requirement of registration by the Bidder from a country sharing land border with India based on order No. F No. 6/18/2019-PPD dated 23/07/2020 of Government of India, Ministry of Finance, Department of Expenditure (Public procurement Division) with up to date amendments, regarding restriction under Rule 144(xi) of the General Financial Rules (GFR) 2017 shall be applicable. Bidder shall submit scanned copy of 'Undertaking' on Company's letter head in this regard. (**Annexure- 9**).		Copy uploaded: Yes / No	
17.0	Scanned Copy of undertaking mentioning GST/Pre-GST Taxes, ESI & PF component included in the completion cost submitted in Form-A. **(**as per **Annexure-10)**		Copy uploaded: Yes / No	
18.0	**Any other information**			

Place: ***SIGNATURE WITH STAMP***

Date: *Authorized signatory of the Firm*

Declaration

I ( ) hereby declare that the document submitted/ uploaded/ enclosed are true and correct. In case any document at any stage found fake / incorrect, my EMD may be forfeited and action as deemed fit by AAI can be taken against me.

Place: ***SIGNATURE WITH STAMP***

Date: Authorized signatory of the Firm

GENERAL CONDITIONS OF CONTRACT

AIRPORTS AUTHORITY OF INDIA

GENERAL GUIDELINES

1. "General Conditions of Contract" are applicable for the tender and shall be part of the contract document.

2. The intending bidders will quote their rates in the BOQ referred in Schedule A.

AIRPORTS AUTHORITY OF INDIA

Item Rate Tender & Contract for Work

(A) Tender for the work of: - .....

(i) To be submitted / uploaded as per date and time mentioned in **CRITICAL DATA SHEET**.

(ii) To be opened in presence of tenders who may be pr[illegible]n_____at _____hrs. in the office of _____

Issued to ----------*

Signature of officer issuing d[illegible]----------*

Designation ----------[illegible]----------*

Date of issue ----------[illegible]----------*

DELETED

*(ii) Not applicable for e-tendering

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F, Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, Clauses of contract, Special conditions, Schedule of Rates & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I / We hereby tender for the execution of the work specified for the Chairman Airports Authority of India within the time specified in Schedule 'F', viz., schedule of quantities and in accordance in all respects with the referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such material as are provided for, by and in respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for **Ninety (90) days** from the date of submission of bids i/c extension, if any and not to make any modifications in its terms and conditions.

I / We undertake and confirm that for eligibility of similar work(s) has / have not been got executed on back to back basis through another contractor. Further that, if such a violation comes to the notice of AAI, then I/We shall accept the decision of AAI if we are debarred for tendering in AAI in future works. Also, if such a violation comes to the notice of AAI before date of start of work, the Engineer- in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.

I / We further undertake and confirm that information / documents submitted by us are genuine, and if at any stage such documents/ information found false, then we shall be liable for debarment from tendering in AAI, and any other appropriate legal action.

A sum of ₹ **99,60,000/- (Rupees Ninety-Nine Lakh Sixty Thousand only)** is here by submitted online though payment gateway integrated with CPP e-tendering portal / in the form of Insurance of Surety Bond / Bank Guarantee* as per the format prescribed in tender documents as earnest money deposit (EMD) (Appendix-IA and IB). If I/we, fail to furnish the prescribed performance bank guarantee within prescribed period, I/we agree that the said Chairman, A.A.I. or his successors in office shall without prejudice to any other right or remedy, be at liberty to take appropriate action as per terms of contract. Further, if I/ we fail to commence work as specified, I/we agree that Chairman, A.A.I. or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to initiate an appropriate contractual / legal action. We undertake to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I / We agree that in case of forfeiture of earnest money or Performance Guarantee or both Earnest Money & Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

I / We hereby declare that I / we shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I / we am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State. (* To be deleted which are not applicable)

Date:	Signatures of Contractor:
Witness: Occupation:	Postal Address:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by competent authority on behalf of the Chairman, Airports Authority of India for sum of Rs. _____(Rupees_____).

The letters referred to below shall form part of this contract Agreement:

(i)
(ii)
(iii)

For & on behalf of Chairman, Airports Authority of India
Signature----------

Designation----------

Date----------

C-NIL, I-NIL, O-NIL **GCC-4**

AIRPORTS AUTHORITY OF INDIA

General Rules & Directions

1.	**General Rules & Directions**	All work proposed for execution by contract are notified in a form of invitation to tender pasted in public places /NIC CPP Portal and signed by the officer inviting tender or by publication in Newspapers and posted on AAI web-site and NIC CPP Portal http://etenders.gov.in and www.aai.aero (for reference only). This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit and Performance guarantee to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of Officer inviting tender during office hours.
2.		In the event of the e-tender being submitted by a firm, it must be digitally signed. Such tender will be treated as signed tender. ~~For physical tender it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952~~.
2. (A)		~~In case of the tender submitted by a Joint Venture / Consortium, a copy of joint venture / consortium agreement in the specified proforma defining the lead partner should be submitted. The lead partner shall sign all the documents in respect of the works. The documents signed by any other person or firm other than the lead partner shall not be entertained.~~
3.		Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm. Bank details shall be furnished by the firm through an application duly signed by all partners for payment to the firm through bank transfer.
4.	**Applicable for item Rate Tender only.**	Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenderers, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. The rate(s) must be quoted in decimal coinage. Amount must be quoted in full Rupees by ignoring 50 paise and considering more than 50 paise as Rupee one. In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, then such lowest contractors will be asked to submit revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all subsections / subheads should not be higher than their respective original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer.

		If the revised tendered amount (worked out on the basis of quoted rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tender, among such contractors, shall be decided by draw of lots in the presence of Jt. GM (Engg) / DGM (Engg) / AGM (Engg)/ Sr. Manager (Engg) in-Charge of major and minor component(s) work and the lowest contractors those have quoted equal amount of their tenders. In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted earlier at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited. In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractor. Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the retendering process of the work. **Note:** Till the time software supports the above provisions, revised offers from tenderers forming the tie shall be obtained and procedure prescribed for "Restricted call of tenders" shall be adopted (for e-tenders).
4. (A)	**Applicable for Percentage Rate Tender only.**	In case of Percentage Rate Tenders, tenderer shall fill up the usual printed form, stating at what percentage below/above (in figures as well as in words) the total estimated cost given in Schedule of Quantities at Schedule-A, he will be willing to execute the work. The tender submitted shall be treated as invalid if; 1. The contractor dose not quote percentage above/below on the total amount of tender or any section/sub-head of the tender. 2. The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/sub-head of the tender. 3. The percentage quoted above/below is different in figures and words on the total amount of tender or any section/sub-head of the tender. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. In case the lowest tendered amount (estimated cost + amount worked on the basis of percentage above/ below) of two or more bidders is same, such lowest bidders will be asked to submit revised offer in the form of letter mentioning percentage above/ below on estimated cost of tender including all sub sections/ sub heads as the case may be, but the revised percentage quoted above/ below on tendered cost or on each sub section/ sub head should not be higher than the percentage quoted at the time of submission of tender. The lowest tender shall be decided on the basis of revised offers. In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited. If the revised tendered amount of two more bidders received in revised offer is again found to be equal , the lowest tender, among such bidders, shall be decided by draw of lots in the presence of Jt. GM (Engg)/ DGM (Engg)/ AGM (Engg) /

		Sr. Manager (Engg) in-Charge of work & the lowest bidders those who have quoted equal amount of their tenders. In case all the lowest bidders those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each bidder. Bidders, whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process of the work. **Note: Till the time software supports the above provisions, revised offers from tenderers forming the tie shall be obtained and procedure prescribed for "Restricted call of tenders" shall be adopted**.
4. (B)		In case the lowest tendered amount (estimated cost ± amount worked on the basis of percentage above/ below) of two or more contractor is same, such lowest contractor will be asked to submit sealed revised offer in the form of letter mentioning percentage above/ below on estimated cost of tender including all sub section/ sub heads as the case may be, but the revised percentage quoted above/ below on tendered cost or on each sub section/ sub head should not be higher than the percentage quoted at the time or submission of tender. The lowest tender shall be decided on the basis of revised offers. In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited. If the revised tendered amount of two more contractors received in revised offers is again found to equal, the lowest tender, among such contractor, shall be decided by draw of lots be in the presence of Jt.GM(Engg)/DGM (Engg), AGM (Engg)/Sr. Manager (Engg) in -Charge of major & minor component(s) of work & the lowest bidders those who have quoted same tendered amount of their tenders. In case all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each bidder. Bidders, whose earnest money is forfeited because of non- submission of revised offer, shall not be allowed to participate in the re-tendering process of the work.
5.		The officer inviting tender or his duly authorized representative, will open tenders in the presence of any intending bidders who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall there upon be given to the contractor who shall there upon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule –I. In the event of a tender being rejected, the earnest money shall there upon be returned to the contractor remitting the same, without any interest.
6.		The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
7.		The receipt of an accountant or clerk for any money paid by the bidder towards tender fee will not be considered as any acknowledgement or payment to the officer inviting tender and the bidder shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorised cashier.
8.		The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending bidder without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.

9.		The bidders shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful bidders shall return all the drawings given to them.
9(A).		Use of correcting fluid anywhere in tender document is not permitted. Such tender is liable for rejection. If there is any correction it should be cut with a straight line and should be initialed and cello tape to be provided on all the rates quoted in case of physical tenders.
10.	**Applicable for Item Rate Tender Only.**	In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below / above the rates quoted is liable to be rejected. Rates quoted by the bidder in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, i. If a discrepancy is found between rates in figures and in words, then the rates which correspond with the amount worked out by the bidder shall unless otherwise proved be taken as correct. ii. If the amount of an item is not worked out by the bidder or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. iii. Where the rates quoted by the bidder in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. iv. In event no rate has been quoted for any item(s) leaving space blank both in figure(s) and word(s) or cancelled the quoted rate in figure(s), and word(s) but the amount corresponding to the item(s) is worked out by the bidder and added to the grand total, then rate(s) of the items(s) shall be derived from the amount(s) quoted by the contractor against such item(s). v. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the bidder has included the cost of this/ these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly. vi. Sub Para i to iv above shall not be applicable in case of e-tendering.
	Applicable for percentage rate tender only.	In case of percentage Rate Tenders only percentage quoted shall be considered. Any tender containing item rates is liable to be rejected Percentage quoted by the bidder in percentage rate tender shall be accurately filled in figures and words, so that there is no discrepancy. However, if the bidder has worked out the amount of the tender and if any discrepancy is found in the percentage quoted in words and figures, i. The percentage corresponds with the amount worked out by the bidder shall, unless otherwise proved, be taken as correct. ii. If the amount of the tender is not worked out by the bidder or it does not correspond with the percentage written either in figures or in words, then the percentage quoted by the bidder in words shall be taken as correct. iii. Where the percentage quoted by the bidder in figures and in words tally but the amount is not worked out correctly, the percentage quoted by the bidder will, unless otherwise proved, be taken as correct and not the amount.
11.		In the case of any tender where unit rate of any item / items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.

12.	**Applicable for Item Rate Tender only.**	All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs. 2.15 P' and in case of words, the word 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be upto two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.
12(A).	**Applicable for percentage rate tender only.**	In Percentage Rate Tender, the tenderer shall quote percentage below / above (in figures as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and the same should be written in figures as well as in words in such a way that no interpolation is possible. In case of figures, the word 'Rs' should be written before the figure of rupees and work 'P' after the decimal figures, e.g. 'Rs. 2.15 P' and in case of words, the word 'Rupees' should precede and the word 'Paise' should be written at the end. (quoting of rates in Paise is not applicable in e-tenders)
~~13~~	~~**Acceptance of abnormally low quoted bid (Capital & Revenue Expenditure Contract)**~~	~~An Abnormally Low Bid is one in which the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the contract at the offered price. Processing of such bid shall be as follows:~~ ~~i) The Bid Manager shall seek written clarifications from the lowest Bidder with approval of the tender accepting authority, including detailed price analysis of its Bid price in relation to scope, schedule, resource mobilization, allocation of risks and responsibilities, and any other requirements of the bids document.~~ ~~ii) If, after evaluating the price analysis, the Tender Accepting Authority determines that the Bidder has substantially failed to demonstrate its capability to deliver the contract at the offered price, then the bid/ proposal may be rejected.~~ ~~iii) Such contracts should be closely monitored that final paymentsin such cases do not abnormally increases due to extra items. Further, there is no abnormal increase in quantities of the item for which contractors have initially quoted very high rates.~~
14		i. The bidder, whose tender is accepted, will be required to furnish **performance guarantee of 5% (Five Percent)** of the tendered amount within the period specified in Schedule F. This guarantee shall be in the form of irrevocable Insurance Surety Bonds, Account Payee Demand Draft or Bank Guarantee (including e-Bank Guarantee) issued from any of the Scheduled Commercial Banks (i.e. Indian or Foreign Banksincluded in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative/ Regional Rural Banks) in accordance with the form annexed hereto. (**Appendix-XI**). ii. The bidder, whose tender is accepted, will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 5% of the contract amount of the work. iii. In works where condition of submission of Performance Guarantee is not applicable, the security deposit @ 10% of the tendered value shall be deducted. iv. The Security deposit (under ii & iii above) will be collected by deductions from the running bills of the contractor at the rates mentioned above and the earnest money deposited at the time of tenders, will be treated as a part of the Security Deposit. v. Security deposit will also be accepted in form of Bank Guarantee (including e-

		Bank Guarantee) from any of the Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co- operative / Regional Rural Banks). vi. The contractor shall submit an irrevocable additional performance security in the form of an irrevocable Insurance Surety bond, demand draft, bank guarantee issued from Scheduled Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative /Regional Rural Banks) shall be obtained from the Successful bidder, If the Bid price offered by the selected bidder is lower than 10% of the estimated cost put to tender. This clause shall be binding and enforceable in relation to all works, irrespective of their nature, scope, or value. **Additional performance security Amount and Treatment -** The additional performance security shall be calculated as below- a) **Where the bid price is below 10% but not below 20% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.25% for every percentage of bid price below 10% of the project cost put to bid starting at 11% with the additional bid performance security being 0.25% and this additional performance security percentage shall be applied on the bid price; b) **Where the bid price is below 20% but not below 25% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.50% for every percentage of bid price below 20% of the project cost put to bid starting at 21% with the additional bid performance security being 0.50% and this additional performance security percentage shall be applied on the bid price; c) **Where the bid price is below 25% but not below 30% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.75% for every percentage of bid price below 25% of the project cost put to bid starting at 26% with the additional bid performance security being 0.75% and this additional performance security percentage shall be applied on the bid price; d) **Where the bid price is below 30%**, the additional performance security percentage shall be incremented by 1% for every percentage of bid price below 30% of the project cost put to bid starting at 31% with the additional bid performance security being 1% and this additional performance security percentage shall be applied on the bid price; e) The additional performance security percentage shall be rounded off to the next lower percentage based on whether the decimal point of the percentage of bid price is below 0.5% or next higher percentage based on whether the decimal point of the percentage of bid price is 0. 5% or more. f) All matters pertaining to validity, extension, claims, forfeiture, and any other conditions in relation to the additional performance security shall be governed by the provisions of Clause 1: Performance Security.
15.		On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.

16.		1. The bidder's / service providers shall quote the rate inclusive of all taxes, duties, CESS, fee, royalty charges etc. levied under any statute but excluding GST, EPF and ESIC for all the items. 2. However, GST as applicable, shall be paid to the contractor, for any taxable supply / services / construction rendered by the agency to AAI, against a valid GST invoice as per terms and conditions of the contract. 3. The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis. 4. In case supplies /services / works involve imports; the same should be identified separately. Basic Custom Duty & IGST will be paid directly by AAI by utilizing EPCG license / Duty Credit Scrip under service Export from India Scheme (SEIS) of Govt. of India.
17.		The contractor/ bidder shall give a list of AAI employees related to him.
18.		The tender for the work shall not be witnessed by a contractor or contractors/ bidders who himself / themselves has / have tendered or who may and has / have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
19.		The tender for composite work includes, in addition to building work, all other works such as sanitary and water supply installations drainage installation, electrical work, horticulture work, roads and paths etc. The tenderer apart from being a registered contractor (B&R) of appropriate class, must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage, electrical and horticulture works in the composite tender.
~~20.~~		~~The contractor/ bidder shall submit list of works completed in last 5 years*as well as which are in hand (in progress) in the following format for assessing bidding capacity of the bidders:-~~

~~Name of work~~	~~Name and particulars of Office where work is being executed~~	~~Value of work~~	~~Position of works in progress~~	~~Remarks~~
~~1~~	~~2~~	~~3~~	~~4~~	~~5~~

21		The contractor/ bidder shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Executive Director (Engg.) may in his discretion, without prejudice to any other right or remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.
22		If complete site is available for work, the work shall be completed in the manner specified here in special condition of contract and NIT specifications. **Note:** In such case para 23 below may be deleted by NIT approving authority

23		~~If complete site is not available for taking up the work, the same shall be made available in phases. The scope of work covered in each phase, time for completion of work in each phase and methodology of taking over completed work in phased manner has been specified under special conditions of contract. The completion time for each phase shall be applicable as indicated in tender documents. The work shall also be taken over by Engineer In-Charge in phases. The warranty for the works executed in each phase shall be applied independently w.e.f. date of completion /taking over of individual phase.~~ ~~**Note:** In such case para 22 above may be deleted by NIT approving authority~~

CONDITIONS OF CONTRACT

Definitions:

1.		The contract means the documents forming the tender and acceptance thereof and the formal agreement / agreements executed between the competent authority(s) on behalf of the Chairman, Airports Authority of India and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract / two contracts and shall be complimentary to one another. Contractor has to sign two agreements one consisting BOQ for Civil works and another one for SITC and O&M /AMC / AICMC part. Engineer-in charge could be common for both the agreements. Separate invoices for the civil /construction works and SITC / O&M / AICMC / AMC works have to be raised by the agency referring to the respective agreements to facilitate AAI to claim input tax credit on such SITC / O&M / AICMC / AMC works as mentioned in Schedule 'F' para 2(v).
2.		In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them: - i. The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional. ii. The **site** shall mean the land / or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract. iii. The **Contractor/ tenderer/ bidder** shall mean the individual, firm or company whether incorporated or not, Joint Venture / Consortium undertaking the works and shall include the legal personal representative of such individual or the persons constituting such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company. iv. **The Chairman** means the Chairman Airports Authority of India and his Successors. v. The **Engineer-in-Charge** means the Engineering Officer who shall supervise and be in charge of the work and who shall sign the contract on behalf of the Chairman, Airports Authority of India as mentioned in Schedule 'F' hereunder. vi. **AAI** or **Airports Authority of India** shall mean the Chairman Airports Authority of India. vii. The terms **Member(Planning)** means the head of Department of Engineering, Airports Authority of India. viii. **Accepting Authority** shall mean the authority mentioned in Schedule F. ix. **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, terrorism, military or usurped power, any acts of Airports Authority of India, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely

		due to use or occupation by Airports Authority of India of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Airports Authority of India's faulty design of works. x. **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the prevailing cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover, all overheads and profits. Provided that no extra overheads and profits shall be payable on the parts of works assigned to other agency(s) by the contractor as per terms of contract. xi. **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the government mentioned in Schedule 'F' hereunder, with the amendments thereto issued up to the date of receipt of the tender. xii. **Department** means Airports Authority of India, which invites tender on behalf of Chairman, Airports Authority of India. xiii. **Tendered value** means the value of the entire work as stipulated in the letter of award.
3.	**Scope and Performance**	Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
4.		Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
5.		The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.
6.	**Works to be carried out**	The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities (Schedule- A) shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
7.	**Sufficiency of Tender**	The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
8.	**Discrepancies and Adjustment of Errors**	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.
8.1		In the case of discrepancy between the Schedule of Quantities, the Specifications and / or the Drawings, the following order of preference shall be observed: - i. Description of Schedule of Quantities. ii. Particular/ technical Specification and Special Condition, if any. iii. Drawings. iv. C P W D Specifications.

		v. Indian Standard Specifications of BIS / IRC Code of Practice / ASTM standards. vi. Sound Engineering practice as directed by the Engineer-in-charge, whose decision in this regard shall final and binding on the contractor.
8.2		If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
8.3		Any error in description, quantity or rate in Schedule of Quantities or any Omission there from shall not vitiate the Contractor release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.
8.4	**Payment for similar items with different quoted rates in different subheads of the contract agreement**	If the contractor has quoted different rates for the same item appearing in two or more subheads, then the lowest of the rates quoted shall only be considered for payments during execution of work. In case of deviation of quantity of such item, payments shall be made at the lowest quoted rate for quantity executed upto the deviation limit specified in the contract. Beyond the deviation limit the rate shall be derived as per relevant contract provision.
9.	**Reverse Auction for purchase tenders**	~~AAI may opt for reverse auction in case of purchase tender if value of supplies put to tender is more than Rs. 2Cr.~~
	Signing of Contract	The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall within 15 days from the date of Award of the work, shall **sign either single or Two agreement, as the case may be**, one consisting BOQ for Civil works and another one for SITC and O&M / AMC / AICMC part.
i)		i. The notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto. ii. Standard AAI Form as mentioned in Schedule 'F' consisting of: a. Various standard clauses with corrections up to the date stipulated in Schedule 'F' along with annexures thereto. b. AAI Safety Code. c. Model Rules for the protection of health, sanitary arrangements for workers employed by AAI or its contractors. d. AAI Contractor's Labour Regulations. e. List of Acts and omissions for which fines can be imposed. **iii. No payment for the work done will be made unless contract in form of agreement is signed by the contractor.**

CLAUSES OF CONTRACT

CLAUSE 1

	Performance Guarantee	This clause is applicable for the works for which the estimated cost put to tender is more than Rs.5 crores.
		i. The contractor shall submit an irrevocable Performance Guarantee of 5% (Five percent) of the Tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'F' from the date of issue of award letter. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft or Bank Guarantee (including e-Bank Guarantee) from any of the Scheduled Commercial Banks (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative/ Regional Rural Banks) in accordance with the form annexed hereto. (Appendix-XI).
		ii Performance guarantee should be furnished within 30 days of issue of letter for intent. In case the contractor fails to deposit performance guarantee within the stipulated period tender shall be stands cancelled without any notice. Further, EMD shall be forfeited, and the contractor shall be liable for debarment up to a period of two (02) years. Further, the award letter shall be issued on receipt of Performance Guarantee and Additional Performance Guarantee and contract agreement shall be signed within 10 days of issue of award letter.
		iii. The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 180 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Guarantee extended to cover such enlarged time for completion of work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest. However, in case of contracts involving maintenance of buildings and services / any other work thereafter, 50% of Performance Guarantee shall be retained as Security Deposit as per contract conditions. The same shall be returned on successful completion of commitment year wise proportionately.
		iv. The Engineer-in-Charge shall not make a claim under the performance guarantee except for amounts to which the AAI is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of: a. Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee. b. Failure by the contractor to pay the Chairman, AAI any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-Charge. v. In the event of the contract being determined or rescinded under provision of any of the Clause/ Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Chairman, AAI.

CLAUSE 1 A

	Recovery of Security Deposit	The person/ persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit AAI at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running and final bill till the sum deducted will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by AAI by way of Security Deposit unless he/ they has/ have deposited the amount of Security at the rate mentioned above in the form of Bank Guarantee (including e-Bank Guarantee) from any of the Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative/ Regional Rural Banks). In case a Guarantee Bonds of any Bank is furnished by the contractor to the AAI as part of the security deposit and the Bank is unable to make payment against the said Guarantee Bond, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the AAI to make good the deficit. In works where condition of submission of performance guarantee is not applicable, the security deposit at the rate of 10% (Ten Percent) of gross amount of each running bill shall be deducted instead of 5%, till the sum will amount to security deposit of 10% of the contract value of work. Other conditions shall remain same as stated above. All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from,or paid by the sale of a sufficient part of his security deposit or from the interest arising therefrom, or from any sums which may be due to or may become due to the contractor by AAI on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in Fixed Deposit Receipt, Insurance Surety Bonds, Account Payee Demand Draft or Bank Guarantee from any of the Commercial Bank (if deposited for more than 12 months) endorsed in favour of the Airports Authority of India, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills and the final bill of the contractor at the rates mentioned above. The security deposit as deducted above can be released against Bank Guarantee issued by any Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative /Regional Rural Banks), on its accumulations to a minimum of Rs. 5 lakhs to the condition amount of such bank guarantee, except last one, shall not be lessthan Rs. 5 lakhs. **Note 1:** Provided further that the validity of Bank Guarantee shall be in conformity with provisions contained in the clause 17 which shall be extended from time to time depending upon extension of contract under provision of Clause 2 & Clause 5 **Note 2:** Note 1 above shall be applicable for both clause 1 and 1 A.

CLAUSE 1 B

	Additional Performance Security	The contractor shall submit an irrevocable additional performance security in the form of an irrevocable Insurance Surety bond, demand draft, bank guarantee issued from Scheduled Commercial Bank (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act,1934 excluding Co-Operative /Regional Rural Banks), If the Bid price offered by the selected bidder is lower than 10% of the estimated cost put to tender. This clause shall be binding and enforceable in relation to all works, irrespective of their nature, scope, or value. Additional performance security shall be submitted by the successful bidder within the 30 days of issue of letter for intent. In case the contractor fails to deposit Additional performance guarantee within the stipulated period tender shall be stands cancelled without any notice. Further, EMD shall be forfeited, and the contractor shall be liable for debarment up to a period of two (02) years. **Additional performance security Amount and Treatment -** The additional performance security shall be calculated as below- **(i) Where the bid price is below 10% but not below 20% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.25% for every percentage of bid price below 10% of the project cost put to bid starting at 11% with the additional bid performance security being 0.25% and this additional performance security percentage shall be applied on the bid price; **(ii) Where the bid price is below 20% but not below 25% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.50% for every percentage of bid price below 20% of the project cost put to bid starting at 21% with the additional bid performance security being 0.50% and this additional performance security percentage shall be applied on the bid price; **(iii) Where the bid price is below 25% but not below 30% of the project cost put to bid**, the additional performance security percentage shall be incremented by 0.75% for every percentage of bid price below 25% of the project cost put to bid starting at 26% with the additional bid performance security being 0.75% and this additional performance security percentage shall be applied on the bid price; **(iv) Where the bid price is below 30%**, the additional performance security percentage shall be incremented by 1% for every percentage of bid price below 30% of the project cost put to bid starting at 31% with the additional bid performance security being 1% and this additional performance security percentage shall be applied on the bid price; **(v)** The additional performance security percentage shall be rounded off to the next lower percentage based on whether the decimal point of the percentage of bid price is below 0.5% or next higher percentage based on whether the decimal point of the percentage of bid price is 0. 5% or more. **(vi)** All matters pertaining to validity, extension, claims, forfeiture, and any other conditions in relation to the additional performance security shall be governed by the provisions of Clause 1: Performance Security.

	Compensation for Delay	If the contractor fails to maintain the required progress in terms of clause 5 or to complete the Work and clear the site on or before the contract or justified extended date of completion as per clause 5(excluding any extension under clause 5.5) as well as any extension granted under clause 12 and 15, he shall, without prejudice to any other right or remedy available under the law to the AAI on account of such breach, pay as compensation the amount calculated at the rates stipulated below as the authority specified in schedule 'F' may decide on the amount of Tendered Value of the work for every completed day/ month (as determined) that the progress remains below that specified in Clause 5 or that the work remains incomplete. This will also apply to items or group of items for which a separate period of completion has been specified.	
		i) Compensation for delay of work	If the completion of work is delayed due to reasons attributed to contractor, AAI shall be entitled for compensation for delay as detailed below: **i. For works costing upto Rs. 10 Lac:** 1.0% (one percent) of tendered value per week of delay or lesser amount as decided by the competent authority subject to a maximum of 10% of contract value. **ii For works costing more than Rs. 10 Lac:** 0.5% (half percent) of tendered value per week of delay or lesser amount as decided by the competent authority subject to a maximum of 10% of the tendered value.
		Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the Sectional part of work as mentioned in schedule 'F' for which a separate period of completion is originally given. In case no compensation has been decided by the authority in Schedule 'F' during the progress of work, this shall be no waiver of right to levy compensation by the said authority if the work remains incomplete on final justified extended date of completion. If the Engineer-in-Charge decides to give further extension of time allowing performance of work beyond the justified extended date, the contractor shall be liable to pay compensation for such extended period. If any variation in amount of contract takes place during such extended period beyond justified extended date and the contractor becomes entitled to additional time under clause 12, the net period for such variation shall be accounted for while deciding the period for levy of compensation. However, during such further extended period beyond the justified extended period, if any delay occurs by events under sub clause 5.2, the contractor shall be liable to pay compensation for such delay. Provided that compensation during the progress of work beyond the justified extended date of completion for delay under this clause shall be for non-achievement of sectional completion or part handing over of work on stipulated/ justified extended date for such part work or if delay affects any other works/ services. This is without prejudice to right of action by Engineer-in- Charge under clause 3 for delay in performance and claim of compensation under that clause.		

		In case action under clause 2 has not been finalized and the work has been determined under clause 3, the right of action under this clause shall remain post determination of contract but levy of compensation shall be for days the progress is behind the schedule on date of determination, as assessed by the authority in schedule 'F', after due consideration of justified extension. The compensation for delay, if not decided before the determination of contract, shall be decided after of determination of contract. The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with AAI. In case, the contractor does not achieve a particular milestone mentioned in schedule F, or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied as above. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

Clause2A

	~~**Incentive for early completion**~~	~~In case, the contractor completes the work ahead of stipulated date of completion so provided in 'Schedule F', a bonus @ 1 % (one per cent) of the tendered value per month computed on perday basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Bonus/ Incentive shall be applicable for the contract completed before stipulated date of completion and shall not be applicable for the contract extended beyond the stipulated period even with justified hindrance and without any action of compensation for delay.~~ ~~This clause shall not be applicable for the works which estimatedcost put to tender is less than Rs. 50.00 Cr.~~

Clause2B

	Release of withheld amount against compensation for delay.	Withheld amount towards compensation for delay over and above Rs. 50.00 lacs, can be released against Bank Guarantee (on the format given at Appendix-1) or in the form of guarantee bonds of any Scheduled Bank but not Co-operative or Gramin Bank / Rural Bank (scheduled or Non-scheduled banks), pending finalization of case of extension of time by competent authority as per delegation of powers. Concerned Executive Director (Engg.) will authorize such action on receipt of proposal from the Engineer-In-Charge through proper channel.

Clause 3

	When Contract can be Determined	Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and / or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases: **i.** If the contractor having been given a notice by the Engineer-in-Charge in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter. **ii.** If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence and continues to do so after a notice in writing of seven days from the Engineer-in-Charge. **iii.** If the contractor fails to complete the work or section of work with individual date of completion on or before the stipulated or justified extended date on or before such date of completion, and the Engineer-in-Charge without any prejudice to any other right or remedy under any other provision in the contract has given further reasonable time in a notice given in writing in that behalf as either mutually agreed or in absence of such mutual agreement by his own assessment making such time essence of contract and in the opinion of Engineer-in-Charge, the contractor will be unable to complete the same or does not complete the same within the period specified. **iv.** If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge. **v.** If the contractor shall offer or give or agree to give to any person in AAI service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or for bearing to do or for having done or for borne to do any act in relation to the obtaining or execution of this or any other contract for AAI. **vi.** If the contractor shall enter into a contract with Airports Authority of India in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-charge. **vii.** If the contractor shall obtain a contract with AAI as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits any breach of Integrity Pact. **viii.** If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors. **ix.** If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager

		or which entitle the court to make a winding up order. **x.** If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21days. **xi.** If the contractor assigns (excluding part(s) of work assigned to other agency(s) by the contractor as per terms of contract), transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge. When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Chairman, AAI shall have powers: a. To determine the contract as aforesaid so far as performance of work by the Contractor of work is concerned (of which determination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the AAI. b. After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor or any other means to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work. In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 3 A

		In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract by giving notice to the other party stating the reasons. In such eventuality, the Earnest Money Deposit and the Performance Guarantee of the contractor shall be refunded within 30 days. ***However, no Interest shall be payable in such case.*** Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party.

CLAUSE 3B

		Debarment of Contractor (i) Contractor may be debarred if it is determined under breached the Integrity Pact of clause 41(a) and Code of Integrity of clause 41(b). (ii) Contractor can also be debarred for the reasons like supply of sub-standard material, non-supply of material, abandonment of work, sub-standard quality of work, poor/ unsatisfactory performance. (iii) Contractor shall be liable for debarment in case he fails to deposit performance guarantee within the stipulated period as per tender. (iv) The period of debarment shall be up to two years.

CLAUSE4

	Contractor liable to pay compensation even if action not taken under Clause-3	In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/ or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer- in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

CLAUSE 5

	Time and Extension for Delay	The time allowed for execution of the Works as specified in the Schedule 'F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in schedule 'F' or from the date of handing over of the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, AAI shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.
5.1		After the Contract is awarded, within 15 days, the Contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the Engineer-in-charge. The Chart shall be prepared in direct relation to the time stated in the

Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule F. Project Management shall be done.

a. For works costing upto Rs. 5.00 Cr. -- CPM/ PERT Chart

b. Works costing more than Rs. 5.00 Cr. -- By using Project Management Software like Primavera /MS Project or any other software with the approval of Engineer-in-charge.

c. Contractor shall submit monthly progress reports (2 copies) highlighting status of various activities and physical completion of work.

PROGRAMME CHART

i. The Contractor shall prepare an integrated programme chart in Project Management Software for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in- Charge within fifteen days of award of the contract. A recovery of Rs. 2500/- (for works costing upto Rs. 5.00 Crores) / Rs. 5000/- (for works costing more than Rs. 5.00 Crores) shall be made on per day basis in case of delay in submission of the above programme.

ii. The programme chart should include the following:
   a. Descriptive note explaining sequence of the various activities.
   b. Network (PERT / CPM / BARCHART).
   c. Programme for procurement of materials by the contractor.

   Programme for deployment of machinery / equipment's having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. In addition to above, to achieve the progress of work as per programme, the contractor must bring at site adequate shuttering material required for cement concrete and R.C.C. works etc. for three floors within one month from the date of start of work till the completion of RCC work as per requirement of work. The contractor shall submit shuttering schedule adequate to complete structure work within laid down physical milestone.

iii. If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones, the contractor shall produce a revised programme within 7 (seven) days, showing the modifications to the approved programme to ensure timely completion of the work. The modified schedule of programme shall be approved by the Engineer in Charge. A recovery of Rs. 2500/- (for works costing upto Rs.5.00 Crores) / Rs. 5000/- (for works costing more than Rs.5.00 Crores) shall be made on per day basis in case of delay in submission of the modified programme.

		iv. The submission for approval by the Engineer-in-Charge of such programme or such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement. v. The contractor shall submit the progress report using MS Project/Primavera software with base line programme referred above for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs.2500/-(for works costing upto Rs.5.00 Crores) / Rs. 5000/- (for works costing more than Rs.5.00 Crores) shall be made on per day basis in case of delay in submission of the monthly progress report.
5.2		If the work(s) be delayed by: - i. Force majeure, or an act of terrorism ii. Abnormally bad weather or iii. Serious loss or damage by fire or iv. Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work or v. Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge for executing work not forming part of the Contract, or vi. Non-availability of stores, which are the responsibility of AAI to supply or vii. Non-availability or break down of tools and Plant to be supplied or supplied by AAI or viii. Any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control. then upon the happening of any such event causing delay, the contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the works. All correspondence with the agency and concerned stakeholders during execution of works will be taken into consideration for evaluation of hindrances causing delay, for grant of extension of time by the Competent Authority.
5.3		Request for rescheduling of Milestones and extension of time, to be eligible for consideration, shall be made by the contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form to the authority indicated in schedule 'F'. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.
5.4		In any such case the Engineer-in-Charge with the approval of authority indicated in Schedule 'F' may give a fair and reasonable extension of time and reschedule the Milestones for completion of work. Such extension or re- scheduling of the milestone shall be communicated to the contractor by the Engineer-in-charge in writing, within 1 month or 4 weeks of the date of receipt of such request respectively. Non-application by the contractor for extension of time/ re-scheduling of milestones shall not be a bar for giving a fair and reasonable extension /re-scheduling of milestones by the Engineer-in-charge with the approval of authority indicated in schedule 'F' and this shall be binding on the contractor.
5.5		In case the work is delayed by any reasons, in the opinion of the Engineer- in-Charge, by the contractor for reasons beyond the events mentioned in clause 5.2 or clause 5.3 or clause 5.4 and beyond the justified extended date, without prejudice to right to take action under Clause 3, the Engineer-in-Charge may grant extension of time required for completion of work without rescheduling of milestones. The contractor shall be liable for levy of compensation for delay for such extension of time.

CLAUSE 6

	Measurements of Work Done	Engineer-in-charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract of work done. All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the contract. All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorised representative and by the contractor or his authorised representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties. If for any reason the contractor or his authorised representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorised representative does not remain present at the time of such measurements after the contractor or his authorised representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor. The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels. Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a mutually agreed method shall be followed. The contractor shall give, not less than seven days' notice to the Engineer-in- Charge or his authorised Representative of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorised representative of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed. Engineer-in-Charge or his authorised representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels. It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

Clause 6 A

	Computerized Measurement Book	Computerized measurement is mandatory for works costing more than Rs 5.00 Lacs. However, in case of works costing lesser than Rs. 5.00 Lacs Engineer-in-Charge may decide for adopting computerized measurement if required, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract. All measurements of all items having financial value shall be entered by the contractor and compiled in the Shape of the Computerized Measurement Book having pages of A-4 size as per the format of the department so that a complete record is obtained of all the items of works performed under the contract. All such measurements and levels recorded by the contractor or his authorised representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorised representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorised representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the department a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and/or his authorised representative would thereafter check this MB, and record the necessary certificates for their checks/test checks. The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be *100%* correct, and no cutting or overwriting in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the department. Thereafter, the MB shall be taken in the records of Engineer-in-charge, and allotted a number as per the Register of Computerized MBs. This should be done before the corresponding bill is submitted to the Engineer-in-charge for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record by the various officers of the department. The contractor shall also submit to the department separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the "bill. Thereafter, this bill will be processed by the Engineer-in-charge and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements. The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements / levels by the Engineer-in-charge or his representative. Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general of local custom. In the case of item which are not covered by specifications, measurements shall be taken in accordance with

		the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed. The contractor shall give not less than seven days' notice to the Engineer-in-Charge or his authorized representative of the work before covering up or otherwise placing beyond the reach of checking and / or test checking the measurement of any work in order that the same be checked and / or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-charge or his authorized representative of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and / or test checking measurements without such notice having been given or the Engineer-in charge's consent being obtained in writing the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed. Engineer-in-charge or his authorised representative may cause either themselves or through another officer of the department to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels. It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 7

	Payment on Intermediate Certificate to be regarded as Advances	No payment shall be made for work, estimated to cost Rs. One lac or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs. One lac, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Department in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule 'F', in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in- Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in- Charge. An amount of ad-hoc payment not less than 75% of the net amount of the bill under check, shall be made within 10 working days of submission of the bill by the Contractor to the Engineer-in-Charge or his Authorized Engineer together with the account of the material issued by the department, or dismantled materials, if any. The remaining payment is also to be made afterfinal checking of the bill within 28 working days of submission of bill by the contractor. In case of delay in payment of intermediate bills after 30 days of submission of bill by the contractor, provided the bill

		submitted by the contractor found to be in order, a simple interest @ prevailing rate of interest of General Provident Fund shall be paid to the contractor from the date of expiry of prescribed time limit. All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine of affect in any way powers of the Engineer-in- charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract. Pending consideration or extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the department to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority. The Engineer-in-Charge in his sole discretion on the basis of a certificate from the Asstt Manager / Manager (Engg) to the effect that the work has been completed up to the level in question make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) up to lintel level (including sunshade etc.) and slab level, for each floor working out at 75% of the assessed value. The advance payments so allowed shall be adjusted in the subsequent interim bill(s) to be submitted by the contractor within10 days of the interim payment. In case of delay in submission of bill by the contractor a simple interest @ 10% (percent) per annum on the advance payment made shall be paid to the AAI from the date of expiry of prescribed 10 days.

CLAUSE – 7A

		No Running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.

CLAUSE 8

	Completion Certificate and Completion Plans	Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete for 'Civil Construction Works' until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and

		sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangement as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in- charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale there of. a. For electrical and mechanical capital works: The contractor shall remove the rubbish from the site. Following conditions must be met before recording completion certificate: Submits completion plan, maintenance manual, manufactures catalogue and gives performance test for system. b. For repair works: The performance of the repaired system has been tested and found satisfactory. c. For AMC work: The system has been tested for its performance/ completeness and taken over by AAI / next agency for operation and maintenance.

CLAUSE 8A

	Contractor to keep site clean	When the annual repairs and maintenance of works are carried out, the splashes and droppings from white washing colour washing, painting etc., on walls, floor, windows etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. Where the work is done without waiting for the actual completion of all the other items of work in the contract, in case the contractor fails to comply with the requirements of this clause, the Engineer-in-charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-charge shall give ten days' notice in writing to the contractor.

CLAUSE 8B

	Completion Plans to be Submitted by the Contractor	The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 2013 and (Part -II External) 1994 or latest available specifications, as applicable within thirty days of the completion of the work. The contractor shall submit completion plan for building works, all services, and obtain occupancy certificate from local bodies on the basis of completion drawings within a period of 30 days from the date of completion. The contractor shall also submit catalogues of all equipment's and maintenance manual for the complete E & M systems. If contractor fails to submit completion plans of all works, he shall be liable to pay compensation @ 0.5% of the tendered value of works costing up to Rs. 5 Crores subject to maximum of Rs. 1.00 Lac and 0.25% for works costing more than Rs. 5 crores subject to maximum of Rs.1.5 Lacs. The decision of Project-in-charge in this regard shall be final and binding on the contractor.

CLAUSE 9

	Payment of final bill	The corrected final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and for those items which are in dispute on account of quantity and/ or rates shall be paid at approved quantity and/ or rates by the Engineer-in-charge, within **three months** period reckoned from the date of receipt of the bill by the Engineer in- Charge or his authorized representative, complete with account of materials issued by the Department and dismantled materials. lf the final bill is submitted by the contractor within the period specified above and payment of final bills is made by the AAI within above prescribed time limit, if delay in payment, a simple interest @ prevailing rate of interest of General Provident Fund shall be paid to the contractor from the date of expiry of prescribed time limit, provided the final bill submitted by the contractor is found to be in order. The Final bill shall be prepared for both L1 & L2 bidders for all tendered items (excluding Extra Items based on market rate) and payment shall be made on the basis of lower of the two.

CLAUSE 9 A

	Payment of contractor's bills to Banks	Payments due to the contractor and refund of various nature may, if so desired by him and wherever possible in banks be made through electronic payment mechanism instead of direct to him, provided that the contractor furnishes to the Engineer-in-Charge. i. Information as per proforma attached. ii. An authorization in the form of a legally valid document such as power of attorney conferring authority on the bank to receive payments and iii. His own acceptance of the correctness of the amount made out as being due to him by Authority or his signature on the bill or other claim preferred against Authority before settlement by the Engineer-in-charge of the account or claim by payment to the bank. While the receipt given by such banks shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible present his bills duly receipted and discharged through his bank. Nothing herein contained shall operate to create in favor of the bank any rights or equities vis-à-vis the Airports Authority of India.

	~~**Materials supplied by Authority**~~	~~Materials which Authority will supply are shown in Schedule 'B' which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof. The contractor shall be bound to procure them from the Engineer-in-charge.~~ ~~As soon as the work is awarded, the contractor shall finalise the programme for the completion of work as per clause 5 of this contract and shall give his estimates of materials required on the basis of drawings/ or schedule of quantities of the work. The contractor shall give in writing his requirement to the Engineer-in-charge, which shall be issued to him keeping in view the progress of work as assessed by the Engineer-in- Charge in accordance with the agreed phased programme of work indicating monthly requirements of various materials. The contractor shall place his indent in writing for issue of such materials at least 7 days in advance of his requirement.~~ ~~Such materials shall be supplied for the purpose of the contract only and the value of the materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as and when materials are consumed in items of work (including normal wastage) for which payment is being made to the contractor, form any sum then due or which may therefore become due to the contractor under the contract or otherwise or from the security deposit. At the time of submission of bills, the contractor shall certify that balance of materials supplied is available at site in original good condition.~~ ~~The contractor shall submit along with every running bill (on account or interim bill) material-wise reconciliation statements supported by complete calculations reconciling total issue, total consumption and certified balance (diameter/ section-wise in the case of steel) and resulting variations and reasons thereof. Engineer-in-charge shall (whose decision shall be final and binding on the contractor) be within his rights to follow the procedure of recovery in clause 42 at any stage of the work if reconciliation is not found to be satisfactory.~~ ~~The contractor shall bear the cost of getting the material issued, loading, transporting to site, unloading, storing under cover as required, cutting assembling and joining the several parts together as necessary. Notwithstanding anything to the contrary contained in any other clause of the contract and all stores / materials so supplied to the contractor or procured with the assistance of the AAI shall remain the absolute property of Authority and the contractor shall be the trustee of the stores/ materials, and the said stores/ materials shall not be removed/ disposed off from the site of the work on any account and shall be at all times open to inspection by the Engineer-in-charge or his authorised agent. Any such stores/ materials remaining unused shall be returned to the Engineer- in-charge in as good a condition in which they were originally supplied at a place directed by him, at a place of issue or any other place specified by him as he shall require, but in case it is decided not to take back the stores/ materials the contractor shall have no claim for compensation on any account of such stores/ materials so supplied to him as aforesaid and not used by him or for any wastage in or damage to in such stores/materials.~~ ~~On being required to return the stores/ materials, the contractor shall hand over the stores/ materials on being paid or credited such price as the Engineer-in-charge shall determine, having due regard to the condition of the stores/ materials. The price allowed for credit to the contractor, however, shall be at the prevailing market rate not exceeding the amount charged to him, excluding the storage charge, if any. The decision of the Engineer-in-charge shall be final and~~

		~~conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to account for contravention of the terms of the licenses or permit and/ or for criminal breach of trust, be liable to Authority for all advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach. Provided that the contractor shall in no case be entitled to any compensation or damages on account of any delay in supply or non-supply thereof all or any such materials and stores provided further that the contractor shall be bound to execute the entire work if the materials are supplied by the Authority within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months, but if a part of the materials only has been supplied within the aforesaid period, then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such extension of time as may be determined by the Engineer-in-charge whose decision in this regard shall be final and binding on the contractor.~~ ~~The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/ original condition at the time of completion or determination of the contract shall be returned to the Engineer in- charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading transporting, unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue.~~

CLAUSE 10 A

	Materials to be provided by the contractor and Mandatory Tests	1. The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the Authority. 2. The contractor shall, at his own expense and without delay; supply to the Engineer in- charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-charge furnish proof, to the satisfaction of the Engineer-in-charge that the materials so comply. The Engineer-in-charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-charge shall be issued after the test results are received. 3. The contractor shall at his cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-charge. 4. ~~If any additional tests apart from mandatory tests specified in the contract are required to be carried out at the instance of AAI or any other advisory body, to ensure conformity of the item to the contract specifications, the cost of such tests shall be borne by AAI. In case the material / equipment fails in the above tests, the expenditure incurred by AAI on testing of such material or equipment along with incidental charges borne by AAI (if any) shall be~~

		~~recovered from the dues of the contractor and action shall be taken under Clause 16 and other relevant clauses of the contract.~~ 5. The contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials. 6. The contractor shall, at his cost, make all arrangements and shall provide all facilities as the Engineer-in-charge may require for collecting and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-charge and bear all charges including testing charges. The Engineer-in-charge or his authorised representative shall always have access to the works and to all workshops and places where work component is being prepared or from where materials manufactured, articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access. 7. The Engineer-in-charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-charge may cause the same to be supplied and all costs which may be attend such removal and substitution shall be borne by the Contractor. 8. The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in Schedule F.

CLAUSE 10 B

(1)	**Secured Advance on Nonperishable materials**	1. The Contractor, on signing an indenture form specified **Appendix-XXI** , shall be entitled to be paid during the progress of the execution of the work upto 75% of the assessed value of any materials, which are in the opinion of the Engineer-in-charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/ or protected against damage by weather or other causes but which have not at time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/ deducted from the next payment made under any of the clause or clauses of this contract. Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-charge provided the contactor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-in-charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel.
(II)	**Mobilization Advance**	2. Mobilization advances not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within six months of the order to commence the work. Such advance shall be released in two or more installments to be determined by the Engineer-in-Charge at his sole discretion.

		The first installment of such advance shall be released by the Engineer-in-charge to the contractor on a request made by the contractor to the Engineer-in-charge in this behalf. The second and subsequent installments shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment(s) to the satisfaction of the Engineer-in-Charge. Before any instalment of advances is released, the contractor shall execute Bank Guarantee Bonds not more than 6(six) in number from commercial Bank for the amount equal to 110% of the amount of advance and valid for the period till recovery of advance. This (Bank Guarantee from commercial Bank on prescribed format for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.
(III)	**Interest on Mobilization advance**	3. The mobilization advance bear simple interest at the rate as mentioned in Schedule 'F' per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance.
	Recovery of Mobilization advance	4. Recovery of such sums advanced shall be made by the deduction from the contractor's bills commencing after first ten percent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment. If the circumstances are considered reasonable by the Engineer-in-Charge, the period mentioned for request by the contractor in writing for grant of mobilization advance may be extended at the discretion of the Engineer-in-Charge.

CLAUSE 10 C

	Payment on Account of Increase in Prices/ Wages due to Statutory Order(s)	If after submission of the tender, if the price of any material incorporated in the works and/ or wages of labour increases as a direct result of the coming into force of any fresh law or statutory rule or order (but not due to any variation of rates in GST applicable on such materials being considered under this clause) beyond the prices / wages prevailing at the time of last stipulated date for receipt of the tenders including extensions, if any, for the work, during contract period including the justified period extended under the provisions of the Clause 5 of the Contract without any action under Clause 2, then the amount of the contract shall accordingly be varied. If after submission of the tender, the price of any material incorporated in the works and / or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rule or order (but not due to any variation of rate in GST applicable on such material(s) being considered under this clause), Authority shall in respect of materials incorporated in the works and/ or labour engaged on the execution of the work after the date of coming into force of such law, statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/ or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/ or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified

		period extended under the provisions of clause 5 of the contract without any action under clause2. Engineer-in-charge shall call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages. The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/ or wages of labour, give notice thereof to the Engineer-in-charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply. For this purpose, the labour component of 85% of the value of the work executed during period under consideration shall not exceed the percentage as specified in Schedule F, and the increase / decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled mazdoor, fixed under any law, statutory rule or order. The cost of work for which escalation applicable is same as cost of work done shall be worked out as below: (a) Gross value of work done up to this quarter: (A) (b) Gross value of work done up to the last quarter: (B) (c) Gross value of work done since previous quarter (C)= (A-B) (d) Full assessed value of Secured Advance fresh paid in this quarter: (D) (e) Full assessed value of Secured Advance recovered in this quarter: (E) (f) Full assessed value of Secured Advance for which escalation Payable in this quarter, (F)= (D-E) (g) Advance payment made during this quarter: (G) (h) Advance payment recovered during this quarter: (H) (i) Advance payment for which escalation is payable in this Quarter (I)= (G-H) (j) Amount paid based on prevailing market rates due to deviations/variations as per Clause 12 during this quarter:(J) Then, M = C-F+I-J N= 0.85 M k. Less cost of services rendered at fixed charges as per Clause 34 and recovered during the quarter (L) l. Less cost of Engineering Consultancy Services rendered at fixed charges as per BOQ and paid during the quarter (X). **Cost of work for which escalation is applicable** **W=N-(L+X)** Provided always that: (a) Where provisions of clause 10C are applicable, provisions of clause 10 CC will not be applicable and; (b) Where provisions of clause 10 CC are applicable, provisions of clause 10C will not be applicable.

CLAUSE 10 CA

	~~**Payment due to variation in prices of materials after receipt of tender**~~	~~If after submission of the tender, the price of materials specified in Schedule F increases/ decreases beyond the base price(s) as indicated in schedule F for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of contract including the justified period extended under the provisions of clause 5 of the contract without any action under Clause 2.~~ ~~However, for work done/ during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (Extra time to be calculated on pro-rata basis only as cost of extra work X stipulated period/ tendered cost).~~

		~~The increase/ decrease in prices of cement, steel reinforcement, structural steel, Bitumen and POL shall be determined by the Price indices issued by the Director General, CPWD. For other items provided in the Schedule 'F', this shall be determined by the All India Wholesale Price Indices of materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry. Base price for cement, steel reinforcement, structural steel and POL shall be as issued under authority of Director General, CPWD applicable for Delhi including Noida, Gurgaon, Faridabad and Ghaziabad and for other places as issued under the authority of Zonal Chief Engineer, CPWD and base price of other materials issued by concerned Zonal Chief Engineer and as indicated in Schedule 'F'. In case, price index of a particular material is not issued by Ministry of Commerce and Industry then the price index of nearest similar material as indicated in Schedule F shall be followed.~~ ~~The amount of the contract shall accordingly be varied for all such materials worked out as per the formula given below for individual material:~~ ~~Adjustment for component of individual material.~~ ~~$V = P \times Q \times \frac{Cl - Cl0}{Cl0}$~~ ~~where,~~ ~~V = Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered~~ ~~P = Base price of material as issued under authority of DG, CPWD or concerned Zonal Chief Engineer CPWD and as indicated in Schedule 'F'.~~ ~~For Projects and original works~~ ~~Q = Quantity of material brought at site for bonafide use in the works since previous bill excluding any such quantity consumed in the deviated quantity of items beyond deviation limit and extra/substituted item, paid/to be paid at rates derived on the basis of market rates under clause12.2~~ ~~For maintenance works~~ ~~Q = Quantity of material brought at site for bonafide use in the works since previous bill including any such quantity consumed in the deviated quantity of items beyond deviation limit paid at agreement rates and extra/substituted item being scheduled items, but excluding nonscheduled extra/substituted item paid/to be paid at market rates under clause12.2~~
		~~Cl0=Price indexforcement, steel reinforcement bars, structural steel and POL as issued by the DG, CPWD and corresponding to the time of base price of respective material indicated in schedule 'F'. For other items, if any provided in Schedule 'F', All India Wholesale Price Index for the material as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce and corresponding to the time of base price of respective material indicated in Schedule F.~~ ~~Cl = Price index for cement, steel reinforcement bars, structural steel and POL as issued under the authority of DG, CPWD for period under consideration. For other items, if any, provided in Schedule 'F' All India Wholesale Price Index for the material for the period under consideration as published by Economic Advisor to Government of India Ministry of Industry and Commerce.~~ ~~**If actual purchase price of material is less than base price P and CI ≥ CI o then, this clause shall not be applicable.**~~ ~~**Note:**~~ ~~i. In respect of justified period extended under the provisions of Clause 5 of the contract without any action under clause 2, the index prevailing at the time of updated stipulated date of completion considering the effect of extra~~

		~~work (extra time to be calculated on prorate basis only as cost of extra work X stipulated period/ tendered cost) shall be considered.~~ ~~Provided always that provisions of the preceding Clause 10 C shall not be applicable in respect of materials covered in this Clause.~~ ~~ii. If during progress of work or at the time of completion of work, it is noticed that any material brought at site is in excess of requirement, then amount of escalation if paid earlier on such excess quantity of material shall be recovered on the basis of cost indices as applied at time of payment of escalation or as prevailing at the time of effecting recovery, whichever is higher.~~ ~~iii. Cement mentioned wherever in this clause includes cement component used in RMC brought at site from outside approved RMC plants, if any.~~ ~~iv. The date wise record of ready mix concrete shall be kept in a register and cement consumption for the same shall be calculated accordingly.~~ ~~If built up steel items are brought at site from workshop, than the variation shall be paid for structural steel up to the period when the built up item/finished product is brought at site.~~ **NOTE: If Actual Purchase Price of Material is less than based price P ~~and CI>=CIo then , this clause shall not be applicable~~**

Clause 10 CC

	~~Price adjustment for works~~	~~If the prices of materials and/ or wages of labour required for execution of work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause2.~~ ~~Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the following provisions:~~ ~~i. The base date for working out such escalation shall be the last stipulated date of the receipt of tenders including extension, if any.~~ ~~ii. The cost of work on which escalation will be payable shall be reckoned as below:~~ ~~a. Gross value of work done upto this quarter:(A)~~ ~~b. Gross value of work done upto the last quarter :(B)~~ ~~c. Gross value of work done since previous quarter (C) = (A-B)~~ ~~d. Full assessed value of secured advance fresh paid in this quarter:(D)~~ ~~e. Full assessed value of secured advance recovered in this quarter(E)~~ ~~f. Full assessed value of secured advance for which escalation is payable In this quarter (F)= (D-E)~~ ~~g. Advance payment made during this quarter(G)~~ ~~h. Advance payment recovered during this quarter(H)~~ ~~i. Advance payment for which escalation is payable in this quarter(I)= (G-H)~~ ~~j. Amount paid based on prevailing market rates due to deviations / variations as per Clause 12 during this quarter:(J)~~ ~~Then, M=(C+F+I J)~~ ~~N= 0.85 M~~ ~~k. Less cost of services rendered at fixed charges as per Clause 34 and recovered during the quarter (L)~~ ~~l. Less cost of Engineering Consultancy Services renders a fixed charge as per BOQ and paid the quarter (X).~~ **~~Cost of work for which escalation is applicable W=N-(L+X)~~**

	~~Materials~~	~~***Cost of Design & Detailing shall be treated as civil work for EPC contract.**~~ ~~Components for materials, labour etc. shall be pre-determined for every work and incorporated in the conditions of contract attached to the tender papers included in Schedule F. The decision of the Engineer-in-charge in working out such percentage shall be binding on the contracts.~~ ~~iii. The following principles shall be followed while working out the payment/recovery on account of variation of prices of materials and/ or wages of labour.~~ ~~(a) The compensation for escalation shall be worked out at quarterly intervals and shall be with respect to the cost of work done as per bills paid during the three calendar months of the said quarter. The date of submission of bill finally by the contractor to the department shall be the guiding factor to decide the bills relevant to the quarterly interval. The first such payment shall be made at the end of three months after the month (excluding the month in which the work order issued) and thereafter at three months' interval. At the time of completion of the work, the last period for payment might become less than 3 months, depending on the actual date of completion.~~ ~~(b) The indices as defined below (excluding L_i) relevant to any quarter/period for which such compensation is to be paid shall be the arithmetical average of the indices relevant to the three calendar months. If the period up to the date of completion after the quarter covered by the last such instalment of payment, is less than three months, the indices shall be the average of the indices for the months falling within that period.~~ ~~(c) The minimum wage of an unskilled Mazdoor shall be the higher of the wage notified by Government of India, Ministry of Labour and that notified by the local administration both relevant to the place of work and the period of reckoning.~~ ~~(d) The escalation for labour also shall be paid at the same quarterly intervals when escalation due to increase in cost of materials is paid under this clause. If such revision of minimum wages takes place during any such quarterly intervals, the escalation compensation shall be payable at revised rates only for work done in subsequent quarters;~~ ~~(e) Irrespective of variations in minimum wages of any category of labour, for the purpose of this clause, the variation in the rate for an unskilled Mazdoor alone shall form the basis for working out the escalation compensation payable on the labour component~~ ~~iv. In the event the price of materials and/or wages of labour for required for execution of the work decreases, there shall be a downward adjustment of the cost of work so that such price of materials and/or wages of labour shall be deductible from the cost of work under this contract and in this regard the formula herein stated below under this Clause lOCC shall mutatis mutandis apply.~~ ~~v. The contract price shall be adjusted for increase or decrease in rates and prices of labour, cement, steel reinforcement bar, fuel and lubricants and other input materials as per percentage of materials/labour specified in schedule F and in accordance with the principles, procedures and formulae specified below:~~ ~~(a) Price adjustment for change in cost shall be paid in accordance with the following formulae:~~ ~~(i) **For Construction:**~~ ~~$Vw = W * (1/100) * [Cp * (C_i - Co)/Co + Lp* (L_i - Lo)/Lo + CMp*(CM_i - CMo)/ CMo + EMp*(EM_i - EMo)/ EMo + Fp* (F_i - Fo)/Fo + Sp* (S_i - So)/So + BP *$~~

		~~$(B_i - Bo)/ Bo]$~~ ~~(ii)~~ **~~For Maintenance:~~** ~~$Vw= W * (1/100) * [LP* (L_i- Lo)/Lo +CMP* (CM_i-CMo)/CMo+EMp* (EM_i-EMo)/ EMo + Bp*(B_i- Bo)/Bo]$~~
	~~POL~~	~~Where, W=cost of work done as per para (ii) above.~~ ~~Vw (Variation of cost of Work) =Increase or decrease in the cost of works during the period under consideration due to change in the rates for relevant components.~~ ~~Percentage components of materials &labour as specified in the schedule F are defined as under: -~~ ~~Cp- Cement component,~~ ~~Lp - Labour component,~~ ~~CMp- Civil component of other construction materials,~~ ~~EMp- E&M i/c IT and AS component of construction materials~~ ~~Fp-POL (Diesel) component~~ ~~Sp- Reinforcement steel bars/TMT bars/structural steel (including strands and cables) component~~ ~~Bp- Bitumen Component~~ ~~Indices for various components of materials & labour to be used for the purpose of this Clause are defined as under:~~ ~~Co= Wholesale Price Index for Pozzolana Cement published by office of the Economic Adviser, Ministry of Industry & Commerce valid for the month of last date of receipt of tender including extension, if any.~~ ~~C_i= Wholesale Price Index for Pozzolana Cement published by office of the Economic Adviser, Ministry of Industry & Commerce for the period under consideration.~~ ~~Lo= Minimum daily wage in rupees of an unskilled adult mazdoor, fixed under any law, statutory rule or order as on the last date of receipt of tender including extension, if any.~~ ~~L_i= Minimum wage in rupees of an unskilled adult mazdoor, fixed under any law, statutory rule or order as applicable on the last date of the quarter previous to the one under consideration.~~ ~~CMo= Price Index for civil components of other construction materials valid for the month of the last date of receipt of tender including extension, if any, as published by AAI.~~ ~~CM_i= Price Index for civil components of other construction materials for the period under consideration, as published by AAI.~~ ~~EMo= Price Index for E&M components of construction materials valid for the month of the last date of receipt of tender including extension, if any, as published by AAI.~~

	~~**Labour**~~	~~EM_i= Price Index for E&M components of construction materials for the period under consideration, as published by AAI.~~ ~~Fo= Wholesale Price Index of HSD (High Speed Diesel) published by office of the Economic Adviser, Ministry of Industry & Commerce valid for the month of the last date of receipt of tender including extension, if any.~~ ~~F_i= Wholesale Price Index of HSD (High Speed Diesel) published by office of the Economic Adviser, Ministry of Industry & Commerce for the period under consideration.~~ ~~So= Wholesale Price Index of Mild Steel long products published by office of the Economic Adviser, Ministry of Industry & Commerce valid for the month of the last date of receipt of tender including extension, if any~~ ~~S_i= Wholesale Price Index of Mild Steel long products published by office of the Economic Adviser, Ministry of Industry & Commerce for the period under consideration.~~ ~~Bo= Wholesale Price Index of Bitumen published by office of the Economic Adviser, Ministry of Industry & Commerce valid for the month of the last date of receipt of tender including extension, if any~~ ~~B_i= Wholesale Price Index of Bitumen published by office of the Economic Adviser, Ministry of Industry & Commerce for the period under consideration.~~

CLAUSE 10 D

	Dismantled Material AAI Property	The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work etc. as property of AAI and such materials shall be disposed of to the best advantage of Authority according to the instructions in writing issued by the Engineer-in-charge.

CLAUSE 11

	Work to be executed in accordance with specifications, drawings, orders etc.	The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect to the work signed by the Engineer in charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule For in any Bureau of Indian Standard or any other published standard or code or Schedule of Rates or any other printed publication referred to elsewhere in the contract. The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibility for adequacy suitability and safety of all the works and methods of construction.

CLAUSE 12

	Deviations / variations extent and pricing	The Engineer-in-charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineering- charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.
12.1		The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value being ordered, be extended, if requested by the contractor, as follows: i. In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus ii. 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the engineer-in-charge.
12.2	**Deviation, Extra Items and Pricing**	In the case of extra item(s) (items that are completely new, and in addition to the items contained in the contract) the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the Engineer-in-charge shall within Six weeks of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.
	Deviation, substituted items pricing	In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the following para. (i) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted). (ii) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

	Deviation, Deviated Quantities, Pricing	In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in schedule F, the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.
12.3		The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule F, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.
12.4		The contractor shall send to the Engineer-in-Charge once every three months, an upto date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge, which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Executive Director Engineering may authorize consideration of such claims on merits.
12.5		For the purpose of operation of Schedule F, the following works shall be treated as works relating to foundation unless & otherwise defined in the contract: i. For Buildings: All works up to 1.2 meters above ground level or up to floor 1 level whichever is lower. ii. For abutments, piers and well staining: All works up to 1.2 m above the bed level. iii. For retaining walls, wing walls, compound walls, chimneys, overhead reservoirs / tanks and other elevated structures: All works up to 1.2 m above the ground level. iv. For roads, apron, runway &taxi track all items of excavation, filling GSBC and including treatment of sub-base. v. For reservoirs/tanks (other than overhead reservoirs/tanks): All works upto 1.2 meters above the ground level. vi. For basement: All works up to 1.2 m above ground level or up to floor 1 level whichever is lower.
12.6		Any operation incidental to or necessarily has to be in contemplation of tenderer while filing, tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE 13

	Foreclosure of contract due to Abandonment or Reduction in Scope of Work	If at any time after acceptance of the tender or during the progress of work the purpose or object for which the work is being done changes due to any supervening cause and as a result of which the work has to be abandoned or reduced in scope the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor stating the decision as well as the cause for such decision and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works. The contractor shall be paid at contract rates, full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure; i. Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks. ii. AAI shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however AAI shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by AAI, cost of such materials as detailed by Engineer-in- Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor. iii. If any materials supplied by AAI are rendered surplus, the same except normal wastage shall be returned by the contractor to AAI at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to AAI stores, if so required by AAI, shall be paid. iv. Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable. v. Reasonable compensation for repatriation of contractor's site staff and imported labour to the extent necessary.

		The contractor shall, if required by the Engineer- in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition. The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the AAI as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer- in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the AAI from the contractor under the terms of the contract. In the event of action being taken under clause 13 to reduce the scope of work, the contractor may furnish fresh Performance Guarantee on the same conditions, in the same manner and at the same rate for the balance tendered amount and initially valid upto the extended date the completion or stipulated date of completion if no extension has been granted plus 180 days beyond that. Wherever, such a fresh Performance Guarantee is furnished by the contractor, the Engineer in Charge may return the previous Performance Guarantee.

CLAUSE 14

	Carrying out part Work at risk & cost of contractor	a. If contractor: i. At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or ii. Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or iii. Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge. b. The Engineer- in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to AAI, by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to: i. Take possession of the site and any materials, constructional plant, implements, stores, etc., there on, and/or ii. Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

		c. The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and executed at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by AAI because of action under this clause shall not exceed 10% of the tendered value of the work. d. In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor. e. Any excess expenditure incurred or to be incurred by AAI in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by AAI as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to AAI in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30days. f. If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract/ provisions of law. In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

CLAUSE 15

	Suspension of Work	i. The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in- Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons: a. on account of any default on the part of the contractor or; b. for proper execution of the works or part thereof for reasons other than the default of the contractor or, c. For safety of the works or part there of The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

		ii. If the suspension is ordered for reasons (b) and (c) in sub-para (i) above (but not attributed to contractor): a. the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25% for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part and; b. If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in- Charge within fifteen days of the expiry of the period of 30days. c. If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reasons (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in- charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as on omission of such part by AAI or where it affects whole of the works, as an abandonment of the works by AAI, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer- in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by AAI, he shall have no claim to payment of any compensations on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

CLAUSE 15 A

	~~**Compensation in case of delay due to late supply of stipulated material by AAI.**~~	~~The contractor shall not be entitled to claim any compensation from AAI for the losses suffered by him on account of delay by AAI in the supply of materials in Schedule 'B' where such delay is covered by the difficulties relating to supply of wagons, force majeure or any reasonable cause beyond the control of AAI.~~ ~~This clause 15 A will not be applicable for works where no material is stipulated for issue by AAI.~~

CLAUSE16

	Action in case Work not done as per Specifications	All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-Charge, his authorize subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the AAI or any organization engaged by the Department of Quality Assurance and of the Chief technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself. If it shall appear to the Engineer-in -charge or his authorized subordinates in charge of the work or to the Executive Director-In-charge of quality assurance or his subordinate officers or the officers of the organization engaged by the AAI for quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in the case of work costing Rs.10 lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default. In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in schedule 'F' may considered reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE17

	Contractor Liable for Damages, defects during maintenance period	If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months(six months in the case of work costing Rs. Ten lacs and below except road work) after a certificate final or otherwise of its completion shall have been given by the Engineer-in-charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineering in- charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months (six months in the case of work costing Rs. Ten lacs and below except road work~~)~~ after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later. Provided that in the case of road work, if in the opinion of the Engineer-in-charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later~~.~~ In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.

CLAUSE 18

	Contractor to Supply Tools & Plants etc.	The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in charge's stores) machinery, tools & plants as specified in Schedule F. in addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefor to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/ or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

CLAUSE 18 A

	Recovery of Compensation paid to Workmen	In every case in which by virtue of the provisions sub-section(i) of Section 12, of the Workmen's Compensation Act, 1923, AAI is obliged to pay compensation to a workman employed by the contractor, in execution of the works, AAI will recover from the contractor, the amount of the compensation so paid, and, without prejudice to the rights of the AAI under sub-section(2) of Section 12, of the said act, AAI shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by AAI to the contractor whether under this contractor otherwise. AAI shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to AAI full security for all costs for which AAI might become liable in consequence of contesting such claim.

CLAUSE 18 B

	Ensuring Payment and Amenities to Workers if Contractor fails	In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) act 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, AAI is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the AAI Contractor's Labour Regulations or under the Rules framed by AAI from time to time for the protection of health and sanitary arrangements for workers employed by AAI Contractors, AAI will recover from the contractor the amount of wages so paid or the amount of expenditure so incurred and without prejudice to the rights of the AAI under sub section (2) of Section 20, sub section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, AAI shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by AAI to the contractor whether under this contract or otherwise AAI shall not be bound to contest any claim made against it under sub section (1) of Section 20, sub section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the AAI full security for all costs for which AAI might become liable in contesting such claim.

CLAUSE 19

	Labour laws to be complied by the Contractor	The contractor shall obtain a valid license under the contract labour (R&A) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986. The contractor shall also comply with the provisions of the building and other construction workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996. Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non execution of the work.

CLAUSE 19A

		No labour below the age of fourteen years shall be employed on the work.

CLAUSE 19B

	Payment of wages	Payment of wages: i The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in the AAI Contractor's Labour Regulation or as per the provisions of the Contract Labour (Regulation and Abolition) act, 1970 and the contract labour (Regulation and Abolition) Central Rules, 1971 wherever applicable.

		ii The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him. iii In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Airports Authority of India contractor's Labour Regulations made by AAI from time to time in regard to payment of wages wage period, deductions from wages recovery of wages not paid and deductions unauthorizedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable. iv. The following deductions shall be permissible to be made by the Engineer-in-Charge. a. The Engineer-in-charge concerned shall have the right to deduct from the moneys due to the contractor or any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations. b. Under the provision of Minimum Wages (Central) Rule 1950 the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-charge concerned. In the case of Union Territory of Delhi, however, as the all-inclusive minimum daily wages fixed under Notification of the Delhi Administration No.F.12(162) MWO / DAB / 43884-91 dated 31.12.1979 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday would notaries. v. The contractor shall comply with the provisions of the Payment of wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor's Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rule made thereunder from time to time. vi. The contractor shall indemnify and keep indemnified Authority against payments to be made under and for the observance of the laws aforesaid and the AAI Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors. vii. The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

		viii. Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise. ix. The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19C

		In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per AAI Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay a penalty of Rs. 200/- for each default and in addition, the Engineer-in charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 19D

		The contractor shall submit by the 4th and 19th of every month, to the Engineer-in charge a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively: i. the number of labourers employed by him on the work, ii. their working hours, iii. the wages paid to him, iv. the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and v. the number of female workers who have been allowed maternity benefit according to Clause 19F and the amount paid to them Failing which the contractor shall be liable to pay to AAI, a sum not exceeding Rs. 200/- for each default or materially incorrect statement. The decision of the Engineer- in-charge shall be final in deducting from any bill due to the contractor; the amount levied as fine and shall be binding on the contractor.

CLAUSE 19E

		In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by AAI from time to time for the protection of health and sanitary arrangements for workers employed by the AAI and its contractor.

CLAUSE 19F

		Leave and pay during leave shall be regulated as follows: 1. Leave: i. In the case of delivery - maternity leave not exceeding 8 weeks, 4 weeks upto and including the day of delivery and 4 weeks following that day. ii. In the case of miscarriage - upto 3 weeks from the date of miscarriage. 2. Pay: i. In the case of delivery – leave pay during maternity leave will be at the rate of women's average daily earnings, calculated on total wages earned on the days

		when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater. ii. In the case of miscarriage–leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage. 3. Conditions for the grant of Maternity Leave: No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave. 4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in appendix – III and IV, and the same shall be kept at the place of work.

CLAUSE 19 G

		In the event of the contractor (s) committing a default or breach of any of the provisions of the Airports Authority of India Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filling any statement under the provisions of the above Regulations and Rules which is materially incorrect, he / they shall, without prejudice to any other liability, pay to the AAI a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting ,filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 per cent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties. Should it appear to the Engineer-in-Charge that the contractor (s) is / are not properly observing and complying with the provision of the AAI Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R&A) Central Rules 1971, for the protection of health and sanitary arrangements for work – people employed by the contractor (s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor (s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor (s) shall fail within the period specified in the notice to comply with and/ observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities hereinbefore mentioned at the cost of the contractor (s). The contractor (s) shall erect, make and maintain at his / their own expense and to approved standards all necessary huts and sanitary arrangements required for his / their work –people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor (s) requiring that the said huts and sanitary arrangements be remodeled and / or reconstructed according to approved standards, and if the contractor (s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor (s).

CLAUSE 19 H

		The contractor (s) shall at his / their own cost provided his / their labour with a sufficient number of huts (hereinafter referred to as the camp) on the following specifications on a suitable plot of land to be approved the Engineer-in-Charge. **i. Facility to be provided** a. The minimum height of each hut at the eaves level shall be 2.10m (7ft.) and the floor area to be provided will be at the rate of 2.7 sq.m. (30 sq.ft.) for each member of the worker's family staying with the labourer. b. The contractor shall in addition construct suitable cooking places having a minimumareaof1.80mx1.50m(6'x5') adjacent to the hut for each family. c. The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women. d. The contractor (s) shall construct sufficient number of bathing and washing places one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened. **ii. Specifications** a. All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge in case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15 cm (6") above the surrounding ground. The roofs shall be laid with the thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water –tight. b. The contractor (s) shall provide each hut with proper ventilation. c. All doors, windows and ventilators shall be provided with suitable leaves for security purposes. d. There shall be kept an open space of at least 7.2 m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed. **iii. Water Supply** The contractor (s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor (s) shall also at his / their own cost make arrangements for laying pipe lines for water supply to his / their labour camp from the existing mains wherever available and shall pay all fees and charges therefor. **iv.** The site selected for the camp shall be high ground, removed from jungle. **v. Disposal of Excreta**: The contractor (s) shall make necessary arrangement for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor (s) shall make arrangements for the removal of the excreta through the Municipal Committee / authority and inform it about the number of labourers employed so that arrangements may be made by such Committee / authority for the removal of excreta. All charges on this account

		shall be borne by the contractor and paid direct by him to the Municipality / authority. The contractor shall provide one sweeper for every eight seats in case of dry system. **vi. Drainage** The contractor (s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy. vii. The contractor (s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers. **viii. Sanitation** The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19I

		The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors' employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/repair or renovation works etc. where the labour have an easy access to the individual work premises, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour. Assistant Manager/Junior Executive will display a list of contractors working in the colony/Blocks on the notice board in the colony and also at the service center, to apprise the residents about the same.

CLAUSE 19J

		It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody unauthorized during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy upto 5% of tendered value of work may be imposed by the General Manager Engg. Whose decision shall be final both with regard to the justification and quantum and be binding on the contractor. However, the Executive Director Engg., through a notice may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19 K

	Employment of skilled / semiskilled workers	The contractor shall at all stages of work deploy skilled / semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute / Industrial Training Institute/National Institution of Construction Management and research (NICMAR) National Academy of Construction, CIDC or any similar reputed and recognized Institute managed / certified by State / Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled / semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill

		to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer –in- Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding. Provided always, that the provision of this clause shall not be applicable for works with estimated cost put to tender being less than Rs.5 crores.

CLAUSE 19 L

	Contribution of EPF and ESI	The ESI and EPF contributions on the part of employer in respectof this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis. The verification of deployment of labour will be done through biometric attendance system or any other suitable method by the Engineer in Charge. The applicable and eligible amount of EPF & ESI shall be reimbursed preferably within 7 days but not later than 30 days of submission of documentary proof of payment provided same are in order.

CLAUSE 19 M

	Compliance of NGT guidelines	The contractor is required to follow latest NGT guidelines at the construction site and any violation of such guidelines will be in his account.

CLAUSE 20

	Minimum Wages Act to be Complied with	The contractor shall comply with all the provision of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970 amended from time to time and rules framed thereunder and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 21

	Work not to be sublet. Action in case of insolvency	The contract shall not be assigned or sublet without the written approval of Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of AAI in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineers in Charge on behalf of the AAI shall have power to adopt the course specified in Clause 3 hereof in the interest of AAI and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22

		All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of AAI without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

CLAUSE 23

	Changes in firm's Constitution to be intimated	Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause21 hereof and the same action may be taken and the same consequences shall ensue as provided in the said Clause 21.

CLAUSE 24

		All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25

	Dispute Resolution Mechanism and Arbitration	All disputes or differences which may arise out of or in connection with or incidental to the Agreement(s) including any dispute or difference regarding the interpretation of terms and conditions of any clause(s) thereof shall be dealt with as provided hereinafter: **(i) Through Mediation:** All dispute(s), at the first instance, shall be referred to the Mediation Committee of Independent Experts (MCIE) or individual mediator for mediation as per AAI Mediation Policy and applicable laws. All cost of mediation, shall be borne equally by the parties. In case either party withdraws from the Mediation or the dispute(s) is not resolved within 120 days of reference to the Mediation, then the aggrieved party may invoke arbitration through sub para (ii) within 30 days from the date of receipt of Partial Settlement Agreement or Failure Report. **(ii)** Adjudication **through Arbitration:** In case no final settlement has been arrived at between the parties after mediation or partially settled as per sub Para (i) above, the unresolved dispute(s), on invocation by the aggrieved party shall be referred for adjudication by arbitration. Arbitration is restricted to disputes with a value of less than Rs. 10 Crores. The dispute shall be referred to a Sole Arbitrator to be appointed by Chairman/Member, AAI, after obtaining consent of the other party, as per format annexed at **Annexure-XX**. Unless the contract has already been repudiated or terminated, the parties shall, in every case, continue to proceed to perform their respective obligations under the

		agreement. Arbitration proceedings shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996, as amended from time to time. Fee payable to the Arbitrator(s) shall be as per Schedule-IV of the Arbitration & Conciliation Act, 1996 and shall be borne by both the parties equally. No dispute shall be referred for resolution under this clause through arbitration in matters for which eviction & recovery procedure is provided under Chapter -VA of the Airports Authority of India Act, 1994.

		In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Authorities inter-se and also between CPSEs and Government Departments/ Organizations (excluding disputes relating(to Railways, Income Tax , Customs & Excise Departments) , such dispute or difference shall be taken up by either party for its resolution through AMRCD as mentioned in DPE OM No. DPE-021000112023-AMRCD-FTS-13578 dated 8th December 2025 and the decision of AMRCD on the said dispute will be binding on both the parties.

CLAUSE 26

	Contractor to indemnify AAI against Patent Rights	The contractor shall fully indemnify and keep indemnified the Chairman AAI against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay and royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against AAI in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the AAI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27

	Lump sum Provisions in Tender	When the estimate on which a tender is made, includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items ,or if the part of work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lump- sum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provision of the clause.

CLAUSE 28

	Action where no specifications are specified	In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 29

	With-holding and lien in respect of sums due from contractor	i. Whenever any claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the AAI shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-Charge or the AAI shall be entitled to withhold the security deposit if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the AAI shall be entitled to withhold and have lien to retain to the extent of such claimed amount or amounts referred to above from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in Charge of the AAI or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim. It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in- Charge or AAI will be kept withheld or retained as such by the Engineer-in- Charge or AAI till the claim arising out of or under the contract is determined by the arbitrator. (if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the AAI shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable To any partner/limited company as the case may be, whether in his individual capacity or otherwise. ii. AAI shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc,. to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by contractor under the contract or any work claimed to have been done by the him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over payment and it shall be lawful for AAI to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by AAI to the contractor, without any interest there on whatsoever. Provided that the AAI shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the Executive Director Engineering / General Manager Engineering on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Executive Director Engineering / General Manager Engineering.

CLAUSE 29 A

	Lien in respect of claims in other Contracts	i. Any sum of money due and payable to the contractor (including the security deposit refundable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the AAI or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or AAI or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or the AAI or with such other person or persons. ii. It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge or the AAI will be kept withheld or retained as such by the Engineer-in-Charge or the AAI or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

CLAUSE 30

	Employment of coal mining or controlled area labour not permissible	i. The contractor shall not employ coal mining or controlled area labour falling under any category whatsoever or in connection with the work or recruit labour from area within a radius of 32 km (20 miles) of the controlled area. Subject as above the contractor shall employ imported labour only i.e., deposit imported labour or labour imported by contractors from area, from which import is permitted. ii. Where ceiling price for imported labour has been fixed by State or Regional Labour Committees not more than that ceiling price shall be paid to the labour by the contractor. iii. The contractor shall immediately remove any labourer who may be pointed out by the Engineer-in-Charge as being a coal mining or controlled area labourer. Failure to do so shall render the contractor liable to pay to AAI a sum calculated at the rate of Rs.10/- per day per labourer. The certificate of the Engineer-in – Charge about the number of coal mining or controlled area labourer and the number of days for which they worked shall be final and binding upon all parties to this contract. iv. It is declared and agreed between the parties that the aforesaid stipulation in this clause is one in which the public are interested within the meaning of the exception in Section 74 of Indian Contract Act, 1872. **Explanation: -** Controlled area mean the following areas: Districts of Dhanbad, Hazaribagh, Jamtara- Sub-Division under Santhal Pargana Commissionery, District of Bankuara, Birbhum, Burdwan, District of Bilaspur. Any other area which may be declared a Controlled Area by or with the approval of the Central Government.

CLAUSE 31

	Unfiltered water supply	The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions. i. That the water used by the contractor (s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge. ii. The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor (s) if the arrangements made by the contractor(s)forprocurementofwaterareintheopinionoftheEngineer-in-Charge, unsatisfactory.

CLAUSE 31A

	Departmental water supply, if available	Water if available may be supplied to the contractor by the department subject to the following conditions: - i. The water charges @1% shall be recovered on gross amount of the work done. ii. The contractor(s) shall make his/their own arrangement of water connection and laying of pipelines from existing main of source of supply. iii. The Department do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor (s) to make alternative arrangements for water at his/their own cost in the event of any temporary break down in the AAI's water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

CLAUSE 32

	Alternate water arrangements	i. Where there is no piped water supply arrangement and the water is taken by the contractor from the wells or hand pump constructed by the AAI, no charge shall be recovered from the contractor or that account. The contractor shall, however, draw water at such hours of the day that it does not interfere with the normal use for which the hand pumps and well are intended. He will also be responsible for all damage and abnormal repairs arising out of his use, the cost of which shall be recoverable from him. The Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor. ii. The contractor shall be allowed to construct temporary wells in AAI land for taking water for construction purposes only after he has got permission of the Engineer-in-Charge in writing. No charges shall be recovered from the contractor on this account but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.

CLAUSE33

	Return of Surplus materials	Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of AAI either by issue from AAI stocks or purchase made under orders or permits or licenses issued by AAI, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose of them without the written permission of the AAI and return, if required by the engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such prices as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to AAI for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

CLAUSE34

	Hire of plant & Machinery	i. The Contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work except for the Plant & Machinery listed in Schedule 'C' and stipulated for issue to the contractor. If the contractor requires any item of T&P on hire from the T&P available with the AAI over and above the T&P stipulated for issue, the AAI will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-charge. In such a case, all the conditions hereunder for issue of T & P shall also be applicable to such T&P as is agreed to be issued. ii. Plant & Machinery when supplied on hire charges shown in Schedule 'C' shall be made over and taken back at the departmental equipment yard / shed shown in Schedule 'C' and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery with condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-in-charge shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor. iii. The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the department.

		iii. The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over upto and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer-in-charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in- charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown before lunch period or major breakdown will be computed considering half a day's breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major breakdown will be computed starting from the next working day. In case of any dispute under this clause, the decision of the Executive Director (Engg) /General Manager (Engg) shall be final and binding on the contractor. iv. The hire charges shown above are for each day of 8 hours (inclusive of the one hour lunch break) or part thereof. v. Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the Department against any loss or damage caused to the plant and machinery either during transit or at site of work. vi. Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one-hour lunch break. In case of an urgent work however, the Engineer-in charge may, at his discretion, allow the plant and machinery to be worked for more than normal period of 8 hours a day. In that case, the hourly hire charges for overtime to be borne by the contractor shall be 50% more than the normal proportionate hourly charges (1/8th of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for over time, a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored. vii. The contractor shall release the plant and machinery every seventh day for periodical servicing and / or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing / wash out irrespective of the period employed in servicing. viii. The plant and machinery once issued to the contractor shall not be returned by him on account of lack of arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer-in-charge, the work or a portion of work for which the same was issued is completed. ix. Log Book for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the Department and will be countersigned by the contractor or his authorised agent daily. In

		case the contractor contests the correctness of the entries and / or fails to sign the Log Book, the decision of the Engineer-in-charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure). xi. In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or each occasion. (a) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of departmental rollers, maximum quantity of any items to be consolidated for each roller-day shall also be same as in Annexure to Clause 34(x). For less use of rollers, recovery for the less roller days shall be made at the stipulated issue rate. xii. The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-in-charge shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor. xiii. The contractor will be exempted from levy of any hire charges for the number of days he is called upon in writing by the Engineer-in-charge to suspend execution of the work, provided AAI's plant and machinery in question have, in fact, remained idle with the contractor because of the suspension. xiv. In the event of the contractor not requiring any item of plant and machinery issued by AAI though not stipulated for issue in Schedule 'C' any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without, in any way, affecting the right of the Engineer-in-charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

CLAUSE 35

	Condition relating to use of asphaltic materials	i. The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the tar or bitumen used. ii. The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before the process of painting is started and shall hypothecate it to the Engineer-in-Charge. If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution of for reasons other than authorised changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material return to the contractors. Although the materials are hypothecated to AAI, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Engineer-in-Charge in writing.

		iii. The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of the security deposit relating asphaltic work shall be refunded after the expiry of this period.

CLAUSE 36

	Employment of Technical Staff and employees	Contractors Superintendence, Supervision, Technical staff & Employees i. The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract. The Contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name (s), qualifications experience, age, address (s) and other particulars along with certificates, of the principal technical representative to be charge of the work and other technical representative (s) who will be supervising the work. Minimum requirement of such technical representative (s) and their qualifications and experience shall not be lower than specified in schedule 'F". The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative (s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative (s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative (s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-charge and shall be available at site before start of work. All the provisions applicable to the principal technical representative under the clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative (s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required to the Engineer-in-Charge and / or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative (s) shall be deemed to have the same force as if these have been given to the contractor. The Principal Technical Representative and other technical representatives shall be actually available at site fully during all stages of execution work, during recording /checking / test checking of measurements of works whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative (s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements / checked measurements / test checked measurements. The representative (s) shall not look after any other work. Substitutes, duly approved by engineer – in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative (s) by more than two days. If the Engineer–in–Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative (s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as

		specified in Schedule 'F' and the decision of the Engineer–in- Charge as recorded in the site order book and measurement recorded checked/test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representative and / or other technical representative (s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibility satisfactorily, the Engineer–in–Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative (s) is / are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative (s) (in the form of copy of Form- 16 or CPF deduction issued to the Engineer employed by him) along with every running account bill / final bill and shall produce evidence if at any times so required by the Engineer–in–Charge. ii. The contractor shall provide and employ on the site only such technical assistants as are skilled, and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work. The contractor shall provide and employ skilled, semi-skilled and unskilled labour as is necessary for proper and timely execution of the work. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes. iii. The contractor shall not change his engineer/supervisory staff after approval of the Engineer-In-Charge. If Contractor wants to replace any of his staff due to unavoidable circumstances, he will seek permission of Engineer-In- Charge indicating reasons for such change, qualification and experience of the alternative employee suggested by him. The qualification and experience of the alternative staff shall not be inferior to the person employed earlier.

CLAUSE 37

	Levy/Taxes/ Royalty/ Land License fee payable by Contractor	1. Taxes: a. Rates to be quoted by the parties should be inclusive of all taxes, duties, CESS, fee, royalty charges etc. levied under any statute but exclusive of GST for all the items b. However, GST, as applicable, shall be paid to the contractor, for any taxable supply / services / construction rendered by the agency to AAI, against a valid GST invoice as per terms and conditions of the contract. c. In case supplies /services / works involve imports; the same should be identified separately.

		2. Royalty: a. The contractor shall at his own expense, provide all materials required for the works other than those which are to be supplied by AAI. The contractor shall deposit royalty and obtain necessary permit for collection of stone, sand, red bajri, kankar etc. from the local authority in the matter and will abide by the notification issued by Central Govt. / State Government / Local State Authorities as applicable from time to time in this regard. The contractor is also bound to allow deduction from his bills any difference in statutory taxes/royalty and penalty proposed by Local State Authorities to AAI till finalization of settlement of all demands in this regard by Central / State Govt. b. This will also be applicable to forest produce. c. If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the AAI and does not any time become payable by the contractor to the State Government. Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the AAI and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor. 3. License fee for land a. Land/space (Paved/ Unpaved Covered-AC or Non-AC), to the extent allotted to contractors during execution of work for the purpose of installation of plants, labour camps, cement go down, site office, stacking of materials shall be provided at free of cost upto defect liability period/ maintenance period. b. A security deposit at the rate of Rs. 500/- per sqm in the form of DD/BG shall be deposited by the contractor. In case contractor do not deposit security deposit same shall be deducted from Ist Running Account Bill. c. Such security deposit shall be released only after allotted land has been fully vacated by the contractor to entire satisfaction of Engineer-in-Charge. If contractor fails to vacate the allotted land/ space (Paved/ Unpaved/ Covered-AC/ Non-AC) after Defect Liability Period/ Maintenance Period of the work shall be charged as per prevailing license fee of the airport plus 25% penalty over that.

CLAUSE 38

	Conditions for reimbursement of levy/taxes if levied after receipt of tenders	1. Rates to be quoted by the parties should be inclusive of all taxes, duties, CESS, fee, royalty charges etc. levied under any statute applicable on last stipulated date of receipt of tender including extension if any but exclusive of GST. No adjustment i.e. increase or decrease shall be made for any variation in the rate of GSI Building and Other Construction Workers Welfare Cess or any tax, levy or Cess applicable on inputs. However, effect of variation, as per Govt. order after the last date of receipt of tender including extension if any, in rates of GST or Building and Other Construction Workers Welfare Cess or imposition or repeal of any other tax, levy or Cess applicable on output of the works contract shall be adjusted on either side, increase or decrease. Provided further that for Building and Other Construction Workers Welfare Cess or any tax (other than GST), levy or Cess varied or imposed after the last date of receipt of tender including extension if any, any increase shall be reimbursed to the contractor only if the contractor necessarily and properly pays such increased amount of taxes / levies / Cess. Provided further that such increase in tax / levy / Cess including GST shall not reimbursed if made in the extended period of contract for which the contractor alone is responsible for delay as determined by authority for extension of time

		under Clause 5 in Schedule F. 2. The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorised representative of AAI or the Engineer-in-Charge and further shall furnish such other information /document as the Engineer-in-Charge may require from time to time. 3. The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or Cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to the condition, together with all necessary information / documents relating thereto.

CLAUSE39

	Termination of contract on death of contractor	Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Engineer-in-charge on behalf of the AAI shall have the option of terminating the contract without compensation to the contractor.

CLAUSE40

	If relative working in AAI then the contractor not allowed to tender.	The contractor shall not be permitted to tender for works in AAI wherein his near relative is posted as an Officer responsible for award and execution of work. He shall also intimate the names of persons who are working with him in any capacity or / are subsequently employed by him and who are near relatives to any officer of AAI. Any breach of this condition by the Contractor would render him, the contract liable to be rejected at any stage. NOTE: By the term "near relatives" is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE41

	No any officer in Department of Engineering to work as contractor within one year of retirement	Engineer or any officer employed in engineering or administrative duties in an engineering department of AAI shall not work as a contractor or employee of contractor for a period of one year after his retirement from AAI service without the prior permission of AAI in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of AAI as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.

CLAUSE 41(a)

	Integrity Pact and Independent External Monitor.	Signing of Integrity Pact (As per **Appendix XVIII**) is mandatory for every bidder/contractor if provided so in Schedule F. All tenderers shall have to submit an undertaking as per Appendix XVIII along with tender documents. AAI shall appoint Independent External Monitor(s) to oversee effective implementation of Integrity Pact for such works/supplies. For this purpose, a panel of Independent External Monitors shall be constituted by the Authority in concurrence with Central Vigilance Commission (CVC). i. The Contractor / Supplier shall have to act in accordance with the conditions laid down in the integrity pact. a. Signing of Integrity Pact is mandatory for every Bidder/Contractor in this procurement/bid process the signed original pact to be send to the office of Bid Manager and should reach before the due date mentioned in NIT. b. The Bidder/contractor shall commit itself to ensure taking all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage as specified in section 3 of the integrity pact. c. Any breach of the aforesaid provisions by the Bidder or any one employed by it or acting on its behalf (whether with or without the knowledge of the Bidder) shall entitle the authority to take all or any one of the action as specified in section 6 of the integrity pact. ii. In case any violation of above conduct is established, AAI reserves right to take following actions. a. If contractor commits a violation of its commitments and obligations under the Integrity Pact Program during bidding process, he shall be liable for disqualification from tender process and forfeiture of his Earnest Money Deposit/ Bid Security. b. In case of violation of the Integrity Pact after award of the contract, Authority is entitled to terminate the contract and shall be entitled to demand and recover from the contractor damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit or Performance Bank Guarantee, whichever is higher. c. Authority may initiate appropriate proceedings against the contractor. d. Contractor will be liable to pay damages as determined by the Authority. e. Contractor against whom an action for violation of its commitments and obligations has been taken earlier again commits a violation, the Authority is entitled to debar such contractor for future tender/ contract processes for a period as deemed fit. f. A violation is considered to have occurred if the Authority is fully satisfied with the available documents and evidence submitted along-with Independent External Monitor's recommendations /suggestions that no reasonable doubt exist in the matter. iii. Person signing IP shall not approach the Courts while representing the matters to IEMs and he / she will await their decision in the matter.

CLAUSE 41(b)

	Code of Integrity	No official of AAI or a bidder shall act in contravention of the codes which includes (i) Prohibition of (a) making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, either directly or indirectly, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process. (b) any omission, or misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided. (c) any collusion, bid rigging or anticompetitive behavior that may impair the transparency, fairness and the progress of the procurement process. (d) improper use of information provided by the procuring entity to the bidder with an intent to gain unfair advantage in the procurement process or for personal gain. (e) any financial or business transactions between the bidder and any official of the procuring entity related to tender or execution process of contract, which can affect the decision of the procuring entity directly or indirectly. (f) any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process. (g) obstruction of any investigation or auditing of a procurement process. (h) making false declaration or providing false information for participation in a tender process or to secure a contract. (ii) Disclosure of conflict of interest. (iii) Disclosure by the bidder of any previous transgressions made in respect of the provisions of sub-clause 41(b)(i) with any entity in any country during the last three years or of being debarred by any other procuring entity.

	Return of material and recovery for excess material issued.	i. After completion of the work and also at any intermediate stage in the event of non-reconciliation of materials issued, consumed and in balance – (see Clause 10), Theoretical quantity of materials issued by the AAI for use in the work shall be calculated on the basis and method given hereunder; a. Quantity of cement & bitumen shall be calculated on the basis of quantity of cement & bitumen required for different items of work as shown in the Schedule of Rates mentioned in Schedule 'F'. In case any item is executed for which standard co-efficient for the consumption of cement or bitumen are not available in the above mentioned schedule / statement or cannot be derived from the same shall be calculated on the basis of standard formula to be laid down by the Engineer-in-Charge. b. Theoretical quantity of steel reinforcement or structural steel sections shall be taken as the quantity required as per design or as authorised by Engineer-in- Charge, including authorised lap pages, chairs etc. plus 3% wastage due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter-wise, section wise and category wise separately. c. Theoretical quantity of G.I. & C.I. or other pipes, conduits, wires and cables pig lead and G.I. / M.S. sheets shall be taken as quantity actually required and measures plus 5% for wastage due to cutting into pieces (except in the case of G.I./M.S. sheets it shall be 10%), such determination & comparison being made diameter-wise &category-wise. d. For any other material as per actual requirements. ii. Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Schedule 'F'. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorised variation, if not returned by the contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within fifteen days of the issue of written notice by the Engineer-in-Charge to this effect shall be recovered at the rates specified in Schedule 'F', without prejudice to the provision of the relevant conditions regarding return of materials governing the contract. Decision of Engineer-in-Charge in regard to theoretical quantities of materials, which should have been actually used as per the Annexure of the standard schedule of rates and recovery at rates specified in Schedule 'F' shall be final and binding on the contractor. For nonscheduled items, the decision of the Engineer – in - charge regarding theoretical quantities of materials which should have been actually used, shall be final and binding on the contractor. g. The said action under this clause is without prejudice to the right of the AAI to take action against the contractor under any other conditions of contract for not doing the work according to the prescribed specifications. h. For materials brought by the contractor for use in item of work at site, similar theoretical consumption shall be prepared and submitted to the Engineer-in-Charge for verification. If it is found that material consumed in the work is less than the theoretical consumption after taking into account permissible minus variation, the recovery for corresponding material shall be effected as per rates specified in schedule 'F' under Clause 42.

CLAUSE43

	Compensation during warlike situations / act of terrorism	The work (whether fully constructed or not) and all materials, machines, tools and plants scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation or act of terrorism, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer- in-Charge, such payments being in addition to compensation upto the value of the work original executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-in charge upto Rs. 5,000/- and by the Executive Director Engg. concerned for a higher amount. The contractor shall be paid for the damages / destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in- Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract. Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operation (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in- Charge (b) for any material etc. not on the site of the work or for any tools plant, machinery, scaffolding, temporary building and other things not intended for the work. In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer – in - charge.

CLAUSE44

	Apprentices Act provisions to be complied with	The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and the Executive Director Engg. / General Manager (Engg.) may, in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

CLAUSE45

	Release of Security Deposit	The Security Deposit of the work shall be refunded if no labour complaint has been received from the labour officer till the due date of its payment. lf a labour complaint is received during this period, the Engineer-in-Charge shall, after issue of notice in this regard to the contractor, withheld the amount required to settle the complaint from his security deposit and refund the balance amount.

CLAUSE 46

	Contractor's Liability and Insurance of Works	i. From commencement to completion of the Works, the Contractor shall take full responsibility for the case thereof and for taking precautions to prevent loss or damage and to minimize loss or damage to the greatest extent possible and shall be liable for any damage or loss that may happen to the Works or any part thereof and all AA l's T & P from any cause whatsoever (save and except the Excepted Risks) and shall at his own cost repair and make good the same so that at completion, the Works and all AAI's T & P shall be in good order and condition and in conformity in every respect with the requirements of the Contract and instructions of the Engineer-in-Charge. ii. In the event of any loss or damage to the Works or any Part thereof or to any T & P, to any material or articles at the Site from any of the Excepted Risks the following provisions shall have effect: a. The Contractor shall, as may be directed in writing by the Engineer-in-Charge, remove from the Site any debris and so much of the works as shall have been damaged, taking to AAI's store such AAI's T & P, articles and/or materials as may be directed; b. The contractor shall, as may be directed in writing by the Engineer-in-Charge, proceed with the erection and completion of the Works under and in accordance with the provisions and Conditions of the Contract; and iii. Provided always that the Contractor shall not be entitled to payment under the above provisions in respect of so much loss or damage as has been occasioned by any failure on his part to perform his obligation under the Contract or not taking precautions to prevent loss or damage or minimize the amount of such loss or damage. iv. Without limiting its obligations and responsibilities under other clauses of General Conditions of Contracts, the contractor at his own cost shall insure in the joint name of AAI and the contractor, against all losses or damages from whatever cause, arising (other than the accepted risks)for which he is responsible under the terms of the contract and in such manner that the AAI and the contractor are covered during the period of construction of works and any loss or damage occasioned by the contractor in the course of any operation carried out by them for the purpose of complying with its obligations of defects liability clause hereof; a. All works including temporary works to their full value executed from time to time. b. The construction materials and equipments to their full value brought on to the site by the contractor. v. The Contractor shall indemnify and keep indemnified AAI against all losses and claims for injuries or damage to any persons or any property whatsoever which may arise out of or in consequence of the construction and maintenance of Works and against all claims, demands proceedings, damage costs, charges and expenses whatsoever in respect of or in relation there to. vi. Before commencing execution of the work, the Contractor shall, without in any way limiting his obligations and responsibilities under this condition, insure at his own cost against any damage, loss or injury which may occur to any AAI property, or to any person for at least the minimum amount of Rs.1.00 lakh with unlimited number of occurrences (including any employee of AAI) by or arising out of carrying out of the Contract. vii. The contractor shall at all times indemnify AAI against all claims, damages or compensation under the provisions of Payment or Wages Act,1936,

		Minimum Wages Act, 1948, Employer's Liability Act, 1938, the Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947 and the Maternity Benefit Act, 1961 or any modifications thereof or any other law relating thereto and rules made there under from time to time or as a consequence of any accident or injury to any workman or other persons in or about the Works, whether in the employment of the Contractor or not, his agents or servants, and also against all costs, charges and expenses of any suit, action or proceedings arising out of such accident or injury and against all sum or sums which may with the consent of the Contractor be paid to compromise or compound any claim. Without limiting his obligations and liabilities as above provided, the Contractor shall insure against all claims, damages or compensation payable under the Workmen's Compensation Act, 1923 or any modification thereof or any other law relating there to. viii. All insurance mentioned above shall be affected with any subsidiary of the General Insurance Company of India or by a company approved by the Insurance Regulatory Authority of India. ix. The aforesaid insurance policy / policies shall provide that they shall not be cancelled till the Engineer-in-Charge has agreed to their cancellation in writing. x. The Contractor shall prove to the Engineer-in-Charge from time to time that he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defects Liability Period. A self-certified copy of such policies is required to be submitted to the Engineer-in-charge. xi. The Contractor shall ensure that similar insurance policies are taken out by his subcontractors (if any) and shall be responsible for any claims or losses to AAI resulting from their failure to obtain adequate insurance protection in connection thereof. The contractor shall produce or cause to be produced by his subcontractor (if any) as the case may be, the relevant policy or policies and premiums receipts as and when required by the Engineer-in-Charge. A self-certified copy of such policies is required to be submitted to the Engineer-in-charge. xii. If the Contractor and/or his subcontractor (if any) shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the terms of the Contract then and in any such case AAI may, without being bound to, effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount **equivalent to 150% of premium or premiums as may be** by AAI from any moneys due or which may become due to the Contractor or recover the same as a debt due from the Contractor only after issuing notice to contractor in this regard. **Engineer-In-Charge shall ensure that all applicable insurances shall be in force without any break as per contract requirement to avoid any losses to AAI on account of non-availability of insurance policies and/or break in insurances policies.** xiii. In case contractor takes Contractor All Risk (CAR) Policy in joint name of AAI and Contractor for full tendered value along with third party liability (max of 10% of tendered value or as applicable as per Insurance Regulatory Authority of India) then there is no requirement for taking separate insurance by sub-contractors. However, workmen compensation policy is required to be taken separately by main contractor and sub-contractor for workers employed by them.

CLAUSE 47

	Composite Contract and responsibilities of main agency	i. The tenders have been called for composite work consisting of civil construction and other associated specialized works. The pre-qualification criteria shall be applicable for each subhead of work independently. The agency meeting PQ criteria for the main work shall be considered for execution of composite work. However, the agency shall be allowed to execute only those specialized subheads of works for which bidder meet PQ criteria individually. ii. The main contractor shall be permitted to execute only those works (covered under one or more subhead) for which he meets all requirements of pre-qualification including financial, technical and technological requirement specified in the PQ criteria. iii. Main contractor will associate expert agencies for the execution of specialized works under various subheads for which he himself has failed to meet PQ criteria. In such case he will appoint his associate for the execution of each specialized work with the approval of the NIT approving authority. The main contractor shall intimate the names of only those agencies who fully meet the PQ criteria for each specialized work for the acceptance of the department. iv. Main contractor shall not be permitted to change their associate agencies in the course of execution of work. If change of agency is inevitable then a request shall be submitted to the engineer-in-charge in writing giving full justification for change of agency. The proposal should include name of the alternate agency along with his financial, technical capabilities and work experience in the appropriate field. Such change shall be allowed only after receiving approval from the competent authority.
	Composite contract- Tripartite agreement	This clause is applicable for the works for which the estimated cost put to tender is more than Rs.500.00 crores. i. The main contractor shall finalise his rates, terms and conditions and mode of execution of work with specialized agencies for all works covered in various subhead of works on receipt of work order but specifications, preferred makes of materials and performance of system shall remain as specified in tender document. ii. The main contractor shall arrange an agreement between department, main contractor and associated agencies for all subheads on receipt of work order from the engineer-in-charge. Main contractor and expert agency shall be jointly responsible for quality of work and performance of the system. iii. Main contractor shall submit list of associated agency for each specialized work within $1/12^{th}$ of stipulated completion period or within one month from issue of work order whichever is later along with documentary evidence for financial soundness, technical capabilities and their experience for executing similar specialized works along with his application seeking acceptance for the name of associated agency. Approval / rejection for the name of associated agency shall be accorded thereafter by NIT approving authority within a period of 15 days each subhead wise. iv. The main contractor shall submit duly signed tripartite agreement on the format provided by AAI within $2/12^{th}$ of stipulated completion period or 60 days whichever is later for acceptance and signature of department. The extension of time for signing of this agreement shall not be generally permitted. The signing time shall only be extended if handing over of site is delayed due to reasons beyond control of the contractor.

	Conditions of composite contract	i. Main contractor shall be responsible for submission of earnest money. ii. The mobilization advance shall be paid to main contractor as per terms and conditions of contract and indicated under Clause 10 B. The first installment of mobilization advance shall be corresponding to the value of work which shall be executed by the main contractor. The subsequent mobilization advances corresponding to value of work covered in each subhead shall be released on signing of each Tripartite Agreement with expert agency for the same. iii. The security deposit shall be deducted from the running bills of main contractor after adjustment of full earnest money. iv. Main contractor shall be responsible for completion of work as per time schedule indicated in the NIT. The compensation for the delay shall be levied on the main contractor only. v. The coordination meetings called by AAI or its representative shall be attended by associated expert agencies as and when required. Expert agency shall be responsible for technical soundness, quality of work and adherence to tender specifications. The main contractor as well as associated agency shall be responsible for rectification of deficiencies noticed in specialized work.
	Payment Conditions for Composite Contract	i. It will be the responsibility of main contractor to finalize expert agencies for the execution of works covered under all subheads of NIT and get the tripartite agreements signed as per NIT requirement at an early date. The main contractor shall not be paid for value of work covered under second running bill & subsequent bills till all Tripartite Agreements are signed by all agencies concerned. ii. The main contractor must fill the ratio of work which shall govern the ratio of direct payment to the expert agency and to the main contractor for each subhead of work in schedule F. This ratio may also be indicated in tripartite agreement. Thus direct payment to each expert agency shall be released in the same ratio from the net payment (after all deductions). iii. The running bill for specialized work shall be processed as per terms and conditions of the contract. All deductions like security deposit, income tax and part rate for incomplete work or due to any other reason shall be made as per contract conditions from each running bill. In case the ratio as desired under (ii) is not filled by the main contractor AAI will make payment of 75% of the net payable amount to the expert agency directly and balance 25% shall be paid to the main contractor.

Clause 48

	Escrow Account	~~i. All payments for the works estimated cost more than Rs.500 Cr shall be made only through Escrow Account opened by the contractor. However, for works costing less than Rs.500 Cr., it shall be at the discretion of Technical Sanctioning authority to opt for Escrow account or not. The bank charges for Escrow Account shall be borne by contractor. The detailed conditions of Escrow Account shall be drawn in consultation with associated bank.~~ ~~ii. Mobilization advance for mobilization of resources and purchase of plant & machinery shall be credited directly to the escrow account opened for this contract through bank transfer as per terms and condition of contract. The agency shall be able to utilize 25% (or as decided by TS authority) of each installment of mobilization advance to meet minor expenses like construction of site office, purchase of office equipment and other minor works, while release of balance 75% fund shall be regulated by the department. The contractor shall seek prior concurrence of Engineer in~~

		~~Charge for release of payment to the supplier etc. through Escrow Account by the Bank. Funds against cheque issued by contractor shall be released by Bank on receipt of written consent from Engineer-in-Charge.~~ ~~iii. Payment received and credited against each RA Bill, can be utilized 25% directly by the contractor for minor expenses like salary, stationary, office expenses etc. AAI shall exercise control for release of payment by contractor for balance 75%.~~ ~~iv. The Contractor shall submit his proposal to the Engineer-in-Charge/Authority for utilization of funds made available by AAI (75% against each RA bill)~~ ~~a. Name of agency for whom payment is proposed to be released.~~ ~~b. Details of work executed/material supplied by agency to whom he intends to release payment.~~ ~~c. Nature of advance payment if any, has to be released to the supplier for supply of material for the project only.~~ ~~d. Documentary evidence in support of his claim.~~ ~~v. Engineer-in-charge will examine and approve full / part of such payments as per agency's request within maximum of three working days. The terms and condition of Escrow Account shall be finalized with bank according to terms and conditions of contract. Bank shall release payment against such cheques only after written consent of authorised officer of AAI is received.~~ ~~vi. Contractor shall be permitted to close Escrow Account on receipt of final payment for the work/project or on receipt of letter for foreclosure of work by the AAI. All balances and liabilities against this Escrow Account shall be left at the disposal of the contractor.~~

AIRPORTS AUTHORITY OF INDIA

SAFETY CODE

1. Suitable Scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1 (¼ horizontal and 1vertical).

2. Scaffolding of staging more than 3.6m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding on staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90cm.(3ft.)

5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11 ½ “) for ladder upto and including 3m. (10ft.) in length. For long ladders, this width should be increased at least ¼” for each additional 30cm. (1 foot) of length. Uniform step spacing of not more than 30cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the site or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person on which may, with the consent of the contractor, be paid to compensate any claim by any such person.

6. a. **Excavation and Trenching** – All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30m. (100ft.) in length or fraction thereof, Ladder shall extend from bottom of the Trench to at least 90cm (3fts) above the surface of the ground. The side of the trenches which are 1.5 m. (5 ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated material shall not be placed within 1.5 m. (5 ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or undercutting shall be done.

b. **Safety Measures for digging bore holes: -**

i. If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;
ii. During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer-in-charge of the work;
iii. Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50 Mtr all around the point of drilling to avoid entry of people /animals;
iv. After drilling the bore well, a cement platform (0.50 Mtr x 0.50 Mtr x 1.20 Mtr) 0.60 Mtr above ground level and 0.60 Mtr below ground level should be constructed around the well casing;
v. After the completion of the bore well, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;
vi. After the bore well is drilled the entire site should be brought to the ground level;

7. Demolition – Before any demolition work is commenced and also during the progress of the work,
   i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
   ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.
   iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned. The following safety equipment shall invariably be provided.
   i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
   ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.
   iii) Those engaged in welding works shall be provided with welder's protective eye-shields.
   iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
   v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measures are adhered to: -
   a) Entry for workers into the line shall not be allowed except under supervision of the Sr. Superintendent (Engg.) or any other higher officer.
   b) At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.
   c) Before entry, presence of toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

d) Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with oxygen kit.
e) Safety belt with rope should be provided to the workers. While working inside the manholes, such rope should be handled by two men standing outside to enable him to be pulled out during emergency.
f) The area should be barricaded or condoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.
h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.
i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time upto which a worker may be allowed to work continuously inside the manhole.
j) Gas masks with Oxygen Cylinder should be kept at site for use in emergency.
k) Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non-sparking gas engines also could be used but they should be placed at least 2 meters away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.
l) The workers engaged for cleaning the manholes / sewers should be properly trained before allowing to work in the manhole.
m) The workers shall be provided with Gumboots or non-sparking shoes bump helmets and gloves non-sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.
n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.
o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.
p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

(vi) The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken: -

a) No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.
b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.
c) Overall shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.

9. An additional clause (viii)(i) of AAI Safety Code (iv) the Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use:

i) White lead, sulphate of lead or product containing these pigments, shall not be used in painting operation except in the form of pastes or paint ready for use.
ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.

iii) Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.
iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
v) Overall shall be worn by working painters during the whole of working period.
vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
vii) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by competent authority of AAI.
viii) AAI may require, when necessary medical examination of workers.
ix) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

10. When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions:
i) (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.
(b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.
ii) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.
iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
iv) In case of departmental machines, the safe working load shall be notified by the Electrical Engineer-in-Charge. As regards contractor's machines the contractors shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the electrical Engineer concerned.

12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

13. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in- Charge of the department or their representatives.

16. Notwithstanding the above clauses from (1) to (15), there is nothing in these to exempt the contractor from the operations of any other Act or Rules in force in the Republic of India.

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FORWORKERS EMPLOYED BY AAI OR ITS CONTRACTORS

1. APPLICATION

These rules shall apply to all buildings and construction works in charge of AAI in which twenty or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the contract work is in progress.

2. DEFINITION

Work place means a place where twenty or more workers are ordinarily employed in connection with construction work on any day during the period during which the contract work is in progress.

3. FIRST-AIDFACILITIES

(i) At every work place, there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

(ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment.

(a) For work places in which the number of contract labour employed does not exceed 50 Each first –aid box shall contain the following equipments:

1. 6 small sterilized dressings
2. 3 medium size sterilized dressings
3. 3 large size sterilized dressings
4. 3 large sterilized burn dressings
5. 1 (30 ml) bottle containing a two per cent alcoholic solution of iodine.
6. 1 (30 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label.
7. 1 snake bite lancet.
8. 1 (30 gms) bottle of potassium permanganate crystals.
9. 1 pair scissors.
10. 1copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institute, Government of India.
11. 1 bottle containing 100 tablets (each of 5 gms) of aspirin.
12. Ointment for burns.
13. A bottle of suitable surgical antiseptic solution.

(b) For work places in which the number of contract labour exceed 50. Each first-aid box shall contain the following equipments.

1. 12 small sterilized dressings.
2. 6 medium size sterilized dressings.
3. 6 large size sterilized dressings
4. 6 large size sterilized burn dressings.
5. 6 (15 gms) packets sterilized cotton wool.
6. 1 (60 ml). Bottle containing two per cent alcoholic solution iodine.
7. 1 (60 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label.
8. 1 roll of adhesive plaster.
9. 1 snake bite lancet.
10. 1 (30 gms) bottle of potassium permanganate crystals.
11. 1 pair scissors.
12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institute / Government of India.
13. A bottle containing 100 tablets (each of 5 gms) of aspirin.

14. Ointment for burns.
15. A bottle of suitable surgical antiseptic solution.

(iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.
(iv) Nothing except the prescribed contents shall be kept in the First-aid box.
(v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the workplace.
(vi) a person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.
(vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.
(viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKINGWATER

i) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.
ii) Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
iii) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.
iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHINGFACILITIES

i) In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.
ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.
iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES ANDURINALS

i) Latrines shall be provided in every work place on the following scale namely:
   a) Where female are employed, there shall be at least one latrine for every 25females.
   b) Where males are employed, there shall be at least one latrine for every 25males.

ii) Provided that, where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be upto the first 100, and one for every 50thereafter.
iii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
iv) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year, Latrines shall not be of a standard lower than bore hole system.

v) (a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women Only" as the case maybe.
(b) The notice shall also bear the figure of a man or of a woman, as the case may be.

vi) There shall be at least one urinal for male workers upto 50 and one for female workers upto fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereafter.

vii) (a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
(b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.

viii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

ix) Disposal of excreta: Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm. Layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

x) The contractor shall at his own expense, carry out all instructions issued to him by the Engineer-in-Charge to effect proper disposal of night soil and other conservancy work in respect of the contractor's workmen or employees on the site. The contractor shall be responsible for payment of any charges which may be levied by Municipal or Cantonment Authority for execution of such on his behalf.

7. PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 meters (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 sft) per head. Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. CRECHES

i) At every work place, at which 20 or more women workers are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause19H (ii) a,b & c.

ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bedroom.

iv) The contractor shall provide one ayaa to look after the children in the crèche when the number of women workers does not exceed 50 and two when the number of women workers exceed50.

v) The use of the rooms earmarked as crèches shall be restricted to children, their attendants and mothers of the children.

9. CANTEENS

i) In every work place where the work regarding the employment of contractor labour is likely to continue for six months and where in contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.

ii) The canteen shall be maintained by the contractor in an efficient manner.

iii) The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

iv) The canteen shall be sufficiently lighted at all times when any person has access to it.

v) The floor shall be made of smooth and impervious materials and inside walls shall be limewashed or colour washed at least once in each year. Provided that the inside walls of the kitchen shall be lime washed every four months.

vi) The premises of the canteen shall be maintained in a clean and sanitary condition.

vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

viii) Suitable arrangements shall be made for the collection and disposal of garbage.

ix) The dining hall shall accommodate at a time 30 per cent of the contract labour working at time.

x) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square metre (10 sft) per diner to be accommodated as prescribed in sub-Rule(ix).

xi) (a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number. (b) Washing places for women shall be separate and screened to secure privacy.

xii) Sufficient tables stools, chairs or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule (ix).

xiii) (a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipment necessary for the efficient running of the canteen.
2.The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.
(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
2. A service counter, if provided, shall have top of smooth and impervious material.
3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipments.

xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

xv) The charges for food stuffs, beverages and any other items served in the canteen shall be based on 'No Profit, No loss' and shall be conspicuously displayed in the canteen.

xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely: -
a) The rent of land and building.
b) The depreciation and maintenance charges for the building and equipments provided for the canteen.
c) The cost of purchase, repairs and replacement of equipments including furniture, crockery, cutlery and utensils.
d) The water charges and other charges incurred for lighting and ventilation.
e) The interest and amounts spent on the provision and maintenance of equipments provided for the canteen.

xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. ANTI-MALARIALPRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge including the filling up of any borrow pits which may have been dug by him.

11. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

AAI may, from time to time, add to or amend these rules and issue directions - it may consider necessary for the purpose of removing any difficulty which may arise in the administration thereof.

AIRPORTS AUTHORITY OF INDIA
Contractor's Labour Regulations

1. SHORTTITLE

These regulations may be called the AAI Contractors Labour Regulations.

2. DEFINITIONS

(i) **Workman** means any person employed by AAI or its contractor directly or indirectly through a subcontractor with or without the knowledge of the AAI to do any skilled, semiskilled or unskilled manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment are expressed or implied but does not include any person: -

a) Who is employed mainly in a managerial or administrative capacity: or

b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature: or

c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the principal employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of the principal employers and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal employer. No person below the age of 14 years shall be employed to act as a workman.

(ii) **Fair Wages** means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.

(iii) **Contractors** shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.

(iv) **Wages** shall have the same meaning as defined in the Payment of Wages Act.

3. i) Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week, he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages.

iii) a) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time irrespective of whether such worker is governed by the Minimum Wages Act or not.

b) Where the minimum wages prescribed by the Central/State Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6days.

c) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substituted holiday to him for the whole day on one of the five days immediately before or after the normal weekly holiday and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

4. DISPLAY OF NOTICE REGARDING WAGES ETC.

The contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clear and legible condition in conspicuous places on the work, notices in English and in the local Indian languages spoken by the majority of the workers giving the minimum rates of wages fixed under Minimum Wages Act, the actual wages being paid, the hours of work for which such wage are earned, wages periods, dates of payments of wages and other relevant information as per Appendix' VIII'.

5. PAYMENT OF WAGES

(i) The contractor shall fix wage periods in respect of which wages shall be payable.

(ii) No wage period shall exceed one month.

(iii) The wages of every person employed as contract labour in an establishment or by a contractor where less than one thousand such persons are employed shall be paid before the expiry of seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.

(iv) Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.

(v) All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.

(vi) Wages due to every worker shall be paid to him direct or to other person authorised by him in this behalf.

(vii) All wages shall be paid in current coin or currency or in both.

(viii) Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act1956.

(ix) A notice showing the wages period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgement.

(x) It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the Senior Superintendent Engg or authorised representative of the Engineer-in-Charge who will be required to be present at the place and time of disbursement of wages by the contractor to workmen.

(xi) The contractor shall obtain from Engineer in charge or the authorised representative of the Engineer-in-Charge a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum-Muster Roll" as the case may be in the following form:
"Certified that the amount shown in column No. …… has been paid to the workman concerned in my presence on ……..at ....."

Note: In case of payment of wages paid through bank, the contractor shall submit a copy of bank statement for relevant period duly signed by him.

6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

(i) The wages of a worker shall be paid to him without any deduction of any kind except the following:
a) Fines
b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.
d) Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.
e) Any other deduction which the Central Government may from time to time allow.

(ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.
Note: An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-XII.

(iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

(iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the total wages, payable to him in respect of that wage period.

(v) No fine imposed on any worker shall be recovered from him by installment, or after the expiry of sixty days from the date on which it was imposed.

(vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect. of which it was imposed.

7. LABOUR RECORDS

(i) The contractor shall maintain a Register of persons employed on work on contract in Form XIII of the CL(R&A) Central Rules 1971 (Appendix VI)

(ii) The contractor shall maintain a Muster Roll register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix VII).

(iii) The contractor shall maintain a Wage Register in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VIII)

(iv) **Register of accident** - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:

- (a) Full particulars of the labourers who met with accident.
- (b) Rate of Wages
- (c) Sex
- (d) Age
- (e) Nature of accident and cause of accident
- (f) Time and date of accident
- (g) Date and time when admitted in Hospital
- (h) Date of discharge from the Hospital
- (i) Period of treatment and result of treatment
- (j) Percentage of loss of earning capacity and disability as assessed by Medical officer
- (k) Claim required to be paid under Workmen's Compensation Act.
- (l) Date of payment of compensation
- (m) Amount paid with details of the person to whom the same was paid
- (n) Authority by whom the compensation was assessed.
- (o) Remarks

(v) The contractor shall maintain a **Register of Fines** in the Form XII of the CL(R&A) Rules 1971(Appendix-XIII).
The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omissions for which fines can be imposed (Appendix-XII)

(vi) The contractor shall maintain a **Register of deductions for damage or loss** in Form XX of the CL (R&A) Rules 1971(Appendix-XIV)

(vii) The contractor shall maintain a **Register of Advances** in Form XXIII of the CL (R&A) Rules 1971(Appendix-XV)

(viii) The contractor shall maintain a **Register of Overtime** in Form XXIII of the CL (R&A) Rules 1971(Appendix-XVI).

8. ATTENDANCE CARD-CUM-WAGESLIP

(i) The contractor shall issue an **Attendance card-cum-wage** slip to each workman employed by him in the specimen form at(Appendix-IX)

(ii) The card shall be valid for each wage period.

(iii) The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.

(iv) The card shall remain in possession of the worker during the wage period under reference.

(v) The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.

(vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

9. EMPLOYMENT CARD

The contractor shall issue an **Employment Card** in Form XIV of the CL (R&A) Central Rules 1971 to each worker within three days of the employment of the worker(Appendix-X).

10. SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a **Service certificate** in Form XV of the CL(R&A) Central Rules 1971.

11. PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulations Nos. 6 & 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-in-Charge or Labour Officer or any other officers authorised by the Ministry of Urban Development in this behalf.

12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY

The Labour Officer or any person authorised by Central Government on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of Fair Wage Clauses and the Provisions of these Regulations. He shall investigate into any complaint regarding the default made by the contractor or subcontractor in regard to such provision.

13. REPORT OF LABOUR OFFICER

The Labour Officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Engineer-in-Charge concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under Clause 13 of these regulations, actual payment to labourers will be made by the Engineer-in-Charge after G.M. Engg. has given his decision on such appeal.

(i) Engineer-in-Charge shall arrange payments to the labour concerned within 45 days from the receipt of the report from the Labour Officer or the G.M. Engineer as the case maybe.

14. APPEAL AGAINST THE DECISION OF LABOUR OFFICER

Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Engineer-in-Charge concerned within 30 days from the date of decision, but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER

(i) A workman shall be entitled to be represented in any investigation or enquiry under these regulations by:

a) An officer of a registered trade union of which he is a member.

b) An officer of a federation of trade unions to which the trade union referred to in Clause (a) is affiliated.

c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.

(ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by:

a) An officer of an association of employers of which he is a member.

b) An officer of a federation of associations of employers to which association referred to in Clause(a) is affiliated.

c) Where the employers is not a member of any association of employers, by an officer of association of employer connected with the industry in which the employer is engaged or by any other employer, engaged in the industry in which the employer is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

16. INSPECTION OF BOOKS AND SLIPS

The contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Officer or any other person, authorised by the Central Government on his behalf .

17. SUBMISSION OF RETURNS

The contractor shall submit periodical returns as may be specified from time to time.

18. AMENDMENTS

The Central Government/AAI may from time to time add to or amend the regulations and on any question as to the application/interpretation or effect of those regulations the decision of the General Manager (Engg.) concerned shall be final.

APPENDIX-I

FORM OF BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT & AMOUNT WITHHIELD AGAINST COMPENSATION FOR DELAY IN INDIVIDUAL CONTRACT (on Non-Judicial Stamp Paper of Rs.100/-)

[Refer Clause 1A and 2B]

To
The Airports Authority of India
…….
……..

1. In consideration of the Airport Authority of India having its head office at New Delhi [hereinafter called the "AAI" which expression shall unless repugnant to the subject or context include its administrator, successors and assigns) having agreed under the terms and condition of Contract Agreement No. ……dated.....made between…….and AAI in connection with the work of.....(hereinafter called the said contract) to accept Deed of Guarantee as herein provided for Rs……. (Rupees……. only) from a Nationalized Bank in lieu of the Security deposit to be made by the contractor or lieu of the amount withheld towards compensation for delay pending final extension of time to be made from the contractors contained in the said Contractor. We, the… .....bank (hereinafter referred to as "the said Bank" and having our registered office at .....do hereby undertake and agree to identify and keep indemnified AAI from time to time to the extent of Rs…… (Rupees…..... only) against any loss or damage, cost,, charges and expenses caused to or suffered by or that may be caused to or suffered by AAI by reason of any breach or breaches by the said Contractor of any of the terms and condition contained in the said contract and to unconditionally pay the amount claimed by AAI on demand and without demur to the extent a foresaid.

2. We..... Bank, further agree that AAI shall be the sole judge of and as to whether the said Contractor has committed any breach or breaches of any of the terms and conditions of the said contract and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by AAI on account thereof and the decision of AAI that the said Contractor has committed such breach and breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered of that may be caused to or suffered by AAI from time to time shall be final and binding on us.

3. We, the said Bank, further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contracts and till all the dues of AAI under the said contract or by virtue of any of the terms and conditions governing the said contract including compensation for delay if any as decided by AAI, have been fully paid and its claims satisfied or discharged and till the Accepting Authority of the contract certifies that the terms and condition and accordingly Contract have been fully and properly carried out by the said contractor and accordingly discharges this guarantee subject, however that AAI shall have no claim under this Guarantee after 90(Ninety) days from the date of expiry of the defects Liabilities periods or Final /Extension of Time grated by AAI as provided available in agreements clause no……..as provided in the said Contract, i.e…….(date) or from the date of cancellation of the said contract, as the case may be, unless a notice of the claim under this Guarantee has been served on the Bank before the expiry of the period in which case the same shall be enforceable against the Bank notwithstanding the fact, that the same is enforced after the expiry of the said period.

4. AAI shall have the fullest liberty without affecting in any way the liability of the bank under this Guarantee or Indemnity from time to time to vary any of the terms and conditions of the said contract or to extend time of performance by the said Contractor or to postpone for any time and form time to time any of the powers exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of terms and conditions governing the said contract or securities available to AAI and the said Bank shall not be released from its liability under these present by any exercise by AAI of any liberty with reference to the matters aforesaid or by reason of time being given to the said contractor or any other forbearance, act or omission on the part by AAI or any indulgence by AAI to the said Contractor or any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the Bank from its such liability.

5. It shall not be necessary for AAI to proceed against the contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank, notwithstanding any security which AAI may have obtained or obtain from the Contractor at the time when proceedings are taken against the Bank hereunder be outstanding or unrealized.

6. We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of AAI in writing and agree that any charge in the Constitution of the said Contract or the said Bank shall not discharge our liability hereunder.

In presence of

Dated this_____Day of _____

WITNESS
1.

2.

For and on behalf of (The Bank)
Signature_____
Name &Designation _____
Authorization No. _____
Name & Place _____
Bank's Seal_____

The above Guarantee is accepted by Airports Authority of India.
For and on behalf of Airports Authority of India
Signature_____
Name_____
Designation_____
Dated _____

APPENDIX-IA

Form of Insurance Surety Bond towards EMD

(To be stamped in accordance with Stamp Act of India)

Insurance Surety Bond No.:

Date:

Name of Work:

To

{AIRPORTS AUTHORITY OF INDIA_____

AIRPORT}

WHEREAS THIS SURETY BOND AGREEMENT is executed at …….this ……..day of ……20….

BETWEEN

a. M/s. …… (Name of the Bidder) having its Registered/Head Office at …..……. (Hereinafter called "the Bidder" which expression shall include its successors, administrators, executors and assigns) ;

AND

b. …….(Name and Address of Insurer) having its registered office at ……..(hereinafter called "the Insurer" which expression shall include its successors, administrators, executors and assigns)

AND

c. Airports Authority of India, a Statutory Body constituted under the Airports Authority of India Act, 1994 State Bank of India Act, 1955 having its Central Headquarters at Rajiv Gandhi Bhavan, Safdarjung Airport, New Delhi, 110003 (hereinafter called the "AAI");

Dear Sirs,

In accordance with Invitation for Bids under your Bid Document No. ***{Tender Reference No.}, dated ……*** M/s ***{Agency's Name}*** having its Registered/Head Office at ***{address}***(hereinafter called the 'Agency') wish to participate in the said bid for ***{Tender Title}.***

As an irrevocable Insurance Surety Bond against Bid Security for an amount of .....(*)..... valid for ..... days from .....(**) required to be submitted by the Supplier as a condition precedent for participation in the said bid which amount is liable to be forfeited on the happening of any contingencies as mentioned

under the Bidding Documents/NIT No. ……

We, the {Name of the Insurer} having our Head Office at {address of the Insurer} guarantee and undertake to pay truly AND immediately on demand by **Airports Authority of India** (hereinafter called the 'Owner') and its successors and assigns by these presents the amount of.....(*) ..... on first written demand, without any DEMUR, reservation, protest, demand and recourse, the insurer binds itself, its successors and assigns by these presents. Any such demand made by the 'Owner' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Agency and/or any right/remedy available to the Agency in terms thereof.

THE CONDITIONS of this obligation are:

(1) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or

(2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him; or

(3) In the case of a successful Bidder, if the Bidder fails or refuses within the specified time limit

i. To execute the Contract Agreement, or

ii. To furnish the required performance security/guarantee within the prescribed time.

iii. The proceeds of Surety Bond (EMD) shall be payable to Owner in case of breach of any of the terms and conditions of the tender by the bidder.

WE undertake to pay to the Owner up to the above amount upon receipt of its first written demand, without the Owner having to substantiate its demand, and that in its demand the Owner/may note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.

The Surety Bond shall not be affected by any change in the constitution or winding up, any absorption, merger or amalgamation of any of the parties to this surety bond, with any other person.

In the event that the obligations of Owner of this Surety Bond are assigned or novated to a third party, the Surety agrees that this Bond shall remain in full force and effect and shall be deemed to apply to the new principal as if originally named herein, provided that the Surety's liability shall not be increased or extended beyond the original terms of this Bond.

This Surety Bond shall be governed by Indian Law and is to be construed in accordance with Indian Law in all its respects. Each hereby agrees to submit to the jurisdiction of the Courts at (#), and to comply with all the requirements necessary to give such Court the jurisdiction. All matters arising hereunder shall be determined in accordance with the law and practice of the Courts at (#)

This Insurance Surety Bond shall be unconditional as well as irrevocable and shall remain valid up

to.....(@) If any further extension of this Insurance Surety Bond is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions from M/s ***{Agency's Name}*** on whose behalf this Insurance Surety Bond is issued.

In witness where of the Insurer, through its authorized officer, has set its hand and stamp on this ..... day of ..... 20..... at .....

.....

(Signature)

.....

(Name)

.....

(Designation with Insurer Stamp and Complete Address, Telephone and Email of the Authorized Signatory)

Authorized Vide Power of Attorney PoA No.....

WITNESSES:

(i) Name & Signature

(ii) Name & Signature

Date.....

NOTE:

1. (*) The amount shall be equivalent to EMD amount specified in the tender.

(**) This shall be the last date of bid submission deadline.

(@) This date shall be thirty (30) days after the last date for which the bid is valid.

(#) This shall be the place where the tender is floated by AAI.

2. The Insurance Surety Bond shall be from an Insurer, registered under the Insurance Act, 1938 as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI) as amended from time to time.

3. The Owner shall be the Creditor, the Supplier shall be the Principal debtor and the Insurance company/Insurer shall be the Surety in respect of the InsuranceSurety Bond to be issued by the Insurer.

4. The Insurance Surety Bond shall be executed on Non-Judicial stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the state(s) where the Insurance Surety Bond is submitted or is to be acted upon or the rate prevailing in State where the Insurance Surety Bond is executed, whichever is higher. The Stamp Paper/e- stamp paper shall be purchased in the name of Supplier/Insurer issuing the Insurance Surety Bond.

5. While getting the Insurance Surety Bond issued, Suppliers are required to ensure compliance to the points mentioned in Form of Bank Guarantee/Insurance Surety Bond Verification Check List enclosed in this Section of Bidding Documents. Further,Suppliers are required to fill up this Form and enclose the same with the Insurance Surety Bond.

6. Each page of Insurance Surety Bond for EMD shall be duly signed / initialed by the executing officers and the last page shall be signed in full by the duly authorized signatory of Insurance Company alongwith two witnesses

APPENDIX-IB

Form of Bank Guarantee against Earnest Money Deposit (Indian Bidder)

WHEREAS, contractor _____ (Name of contractor) (hereinafter called "the contractor") and having its registered office at _____has submitted his tender dated _____ (date) for the _____ (hereinafter called "the TENDER").

KNOW ALL PEOPLE by these presents that we_____(name of bank) having our registered office at_____ (hereinafter called "the bank ") are bound unto Airports Authority of India through its "Bid Manger/Engineer-ln-charge/ AAI's Authorized representative" (Designation with address) (hereinafter called the "Bid Manager/Engineer-ln-charge/ AAI's Authorized representative", as the case may be which expression shall unless repugnant to the subject or contract includes its administrators, successors and assigns) in the sum of Rs._____ (Rs. In words_____) for which payment will truly to be made to the said "Bid Manager / Engineer-ln-charge / AAI's Authorized representative" the bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the Bank this_____ day of_____ 20___

THE CONDITIONS of this obligation are:

(1) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or

(2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him; or

(3) In the case of a successful Bidder, if the Bidder fails or refuses within the specified time limit

i. To execute the Contract Agreement, or

ii. To furnish the required performance security/guarantee within the prescribed time.

iii. The proceeds of Bank Guarantee shall be payable to Owner in case of breach of any of the terms and conditions of the tender by the bidder.

We undertake to pay to the "Bid Manager/Engineer-ln-charge/ AAI's Authorized representative" either up to the above amount or part thereof upon receipt of his first written demand, without the "Bid Manager/Engineer-ln-charge/ AAI's Authorized representative" having to substantiates his demand, provided that in his demand the "Bid Manager/Engineer-ln-charge/ AAI's Authorized representative" will note that the amount claimed by him is due to him owing to the concurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including the date*_____after the deadline for submission of tender as such deadline is stated in the instructions to contractor or as it may be extended by the 'Bid Manager/Engineer-ln-charge/ AAI's Authorized representative", notice of which extension (s) to the bank is hear by waived. Any demand in respect of this guarantee should reach the bank not later than the above date.

DATE ……. SIGNATURE OF THE BANK
WITNESS …… SEAL
(SIGNATURE NAME AND ADDRESS)

* Date to be worked out on the basis of validity period of 6 months from last date of receipt of tender.

APPENDIX-II

PROFORMA FOR MANDATORY TESTS TO BE ATTACHED WITH RUNNING ACCOUNTBILLS

Name of work:.....
Name of Contractor……...
Contract Agreement No. and Date……... R/A Bill No……..……

Sl. No.	Item	Quantities as per Agreement	Frequency as per Specification	No. of Tests Required	Upto date Quantity	No. of Tests Required	No. of Tests actually done	Remarks
1	2	3	4	5	6	7	8	9

Note: If the number of tests done are less than required, then reasons shall be recorded.

Signature of Sudt. (Engg)

Signature of Engineer-in-Charge. **Signature of Manager / AM(Engg)**

C-NIL, I-NIL, O-NIL **GCC-100**

APPENDIX-III

REGISTER OF MATERNITY BENEFITS (Clause 19F)

Name and address of the contractor……

Name and location of the work……

Name of the employee	Father's/husband's name	Nature of employment	Period of actual employment	Date on which notice of confinement given
1	2	3	4	5

Date on which maternity leave commenced and ended

Date of delivery/miscarriage	In case of delivery		In case of delivery	
	Commenced	Ended	Commenced	Ended
6	7	8	9	10

Leave Pay paid to the employee

In case of delivery		In case of miscarriage		Remark
Rate of leave pay	Amount paid	Rate of leave pay	Amount paid	
11	12	13	14	15

APPENDIX-IV

SPECIMEN FORM OF THE REGISTER, REGARDING MATERNITY BENEFIT ADMISSION TO THE CONTRACTOR'S LABOUR IN AIRPORTS AUTHORITY OF INDIA WORKS (CLAUSE 19F)

Name and address of the contractor----------
Name and location of the work----------
---

1) Name of the woman and her husband's name

2) Designation

3) Date of appointment

4) Date with months and years in which she is employed.

5) Date of discharge/dismissal, if any

6) Date of production of certificates in respect of pregnancy.

7) Date on which the woman informs about the expected delivery.

8) Date of delivery/miscarriage/death.

9) Date of production of certificate in respect of delivery/miscarriage.

10) Date with the amount of maternity/death benefit paid in advance of expected delivery

11) Date with amount of subsequent payment of maternity benefit

12) Name of the person nominated by the woman to receive the payment of the maternity benefit after the death.

13) If the woman dies, the date of her death, the name of the person to whom maternity benefit amount was paid, the month thereof and the date in the register.

14) Signature of the contractor authenticating entries in the register.

15) Remarks column for the use of Inspection Officer.

APPENDIX-V

Labour Board

Name of work

Name of Contractor----------Address of Contractor----------

Name and address of A. A. I. Division ----------

Name of A. A. I. Labour Officer ----------

Address of A. A. I. Labour Officer ----------

Name of A.A.I Labour Officer----------

Sl. No.	Category	Minimum wage fixed	Actual wage paid	Number present	Remark

Weekly holiday----------
Wage period----------
Date of payment of wages----------
Working hours----------
Rest interval----------

Form-XIII **APPENDIX-VI**

[See rule 2(1)]

[Part-A: For all Establishments]

Register of Workmen Employed by Contractor

Name and address of contractor…….

Name and address of establishment which contractor is carried on……...

Name and location of work…….

Name and address of Principal Employer……...

Name of the Establishment----------Name of Owner----------LIN----------

Sl. No.	Employee Code	Name	Surname	Gender	Father's/Spouse Name	Date of Birth#	Nationality	Education Level	Date of Joining	Designation
1	2	3	4	5	6	7	8	9	10	11

Category Address *(HS/S/SS/US)	Type of Employment	Mobile	UAN	PAN	ESIC IP	LWF	AADHAAR	Bank A/c Number	Bank	Branch (IFSC)	Present Address	Permanent
12	13	14	15	16	17	18	19	20	21	22	23	24

Service Book No.	Date of Exit	Reason for Exit	Mark of Identification	Photo	Specimen Signature/Thumb Impression	Remarks
25	26	27	28	29	30	31

*(Highly Skilled/Skilled/Semi Skilled/Un Skilled)

#Note: In case the age is between 14 to 18 years, mention the nature of work, daily hours of work and Intervals of rest in the remarks Column.

C-NIL, I-NIL, O-NIL GCC - 104

APPENDIX-VII

Form-XVI
[See Rule 78(1) (a) (i)]

Muster Roll

Name and address of contractor…….

Name and address of establishment which contractor is carried on……...

Name and location of work…….

Name and address of Principal Employer .....For the month of fortnight…….

Sl. 1	Name of work Man 2	Se x 3	Father's/ Husband's 4	Date					Remark
				1	2	3	4	5	

FORM B

[See Rule 78(1) (a) (i)]

APPENDIX-VIII

FORMAT FOR WAGE REGISTER

Name and address of contractor…….

Name and address of establishment which contractor is carried on……...

Name and location of work…….

Name and address of Principal Employer……For the month of fortnight…….

Rate of Minimum Wages and since the date.....				
	Highly Skilled	Skilled	Semi-Skilled	Un Skilled
Minimum Basic				
DA				
Overtime				

Name of the Establishment_____Name of Owner_____LIN_____ Wage period

From_____To_____(Monthly/Fortnightly/Weekly/Daily/Piece Rated)

Sl. No. in Employee register	Name	Rate of Wage	No. of Days worked	Overtime hours worked	Basic	Special Basic	DA	Payments Overtime	HRA	Others	Total
1	2	3	4	5	6	7	8	9	10	11	12

C-NIL, I-NIL, O-NIL GCC - 106

Deduction								Net Payment	Employer Share PF Welfare Found
PF	ESIC	Society	Income Tax	Insurance	Others	Recoveries	Total		
13	14	15	16	17	18	19	20	21	22

Receipt by Employee/Bank Transaction ID	Date of Payment	Remarks
23	24	25

FORM C

FORMAT OF REGISTER OF LOAN/ RECOVERIES

Name of Establishment_____LIN_____

Sl. Number in Employee register	Name	Recovery Type (Damage/loss/fine/advance/loans	Particulars	Date of damage/Loss*	Amount
1	2	3	4	5	6

Whether show cause issued*	Explanation heard in presence of*	Number of Installments	First Month/Year	Last Month/Year	Date of Complete Recovery	Remarks
7	8	9	10	11	12	13

*Applicable only in case of damage/loss/fine

Form-XVII [See Rule 78 (2)(a)]

Register of wages

Name and address of contractor…….

Name and address of establishment which contractor is carried on……...

Name and location of work…….

Name and address of Principal Employer……For the month of fortnight…….

							Amount of wages								
S. No	Name of workman	Serial no in the register of workman	Description/ nature of work done	No. of days worked	Units of work done	Daily rates of wages/ piece rate	Basic wages	Dearness Allowance	Over-time	Other cash payment nt. (indicate nature)	Total	Deduction if any (indicate nature)	Net amount paid	Sig. or thumb impression of the work men	Initial contractor his representative
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

APPENDIX-VIIIA

WAGE CARD

Wages Card No……

Name and Address of Contractor……Date of issue…….

Name and location of work……. Designation……

Name of workman……. Month/Fortnight…….

Rate of Wages……

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Morning																															Rate
Evening																															Amount
Initial																															

Received from……. the sum of Rs… ..... on account of my wages

Signature

The Wage Card is valid for one month from the date of issue

C-NIL, I-NIL, O-NIL GCC - 110

19/Form-XIX **APPENDIX-IX**

78 (2)

[See rule 78 (1) (b)]

Wages Slip

Name and address of contractor……

Name and Father's/Husband name of workman……...

Name and location of work……...

For the week/Fortnight/Month ending……..

1. No. of days worked……

2. No. of units worked in case of piece rate workers…….

3. Rate of daily wages/piece rate……

4. Amount of overtime wages……

5. Gross wages payable…….

6. Deduction, if any……

7. Net amount of wages paid…….

Initials of the contractor or his representative

APPENDIX-X

14/Form-XIV
[See rule 76]
Employment Card

Name and address of contractor……

Name and address of establishment under which is carried…….

Name of work and location of work…….

Name and address of Principal Employee……

1. Name of the workman……...

2. SI. No. in the register of workman employed……...

3. Nature of employment/designation…….

4. Wage rate (with particulars of unit in case of piecework) …….

5. Wage period……

6. Tenure of employment……

7. Remark……

Signature of Contractor

APPENDIX-XI

FORM OF PERFORMANCE SECURITY (GUARANTEE)
Bank Guarantee Bond
(On Non-Judicial Stamp Paper of Rs100/-)

1. In consideration of the Chairman, AAI (hereinafter called "AAI") having offered to accept the terms and conditions of the proposed agreement between …… [hereinafter called the said contractor(s)] for the work …… (hereinafter "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. …..... (Rupees ……. only) as a Performance Guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.
We..... (Indicate the name of the Bank) (hereinafter referred to as "the Bank") hereby under take to pay to the Chairman, AAI an amount not exceeding Rs. ……(Rupees .....only) on demand by AAI.

2. We.....(Indicate the name of the Bank) do hereby undertake to pay the amounts due to payable under this Guarantee without any demure, merely on a demand from AAI stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.……. (Rupees .....only).

3. We, the said Bank, further undertake to pay the Chairman, AAI any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) In any suit or proceeding pending before any court or tribunal relating thereto, our liability under this present being absolute and unequivocal.

   The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

4. We..... (Indicate the name of bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of AAI under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-In-Charge on behalf of AAI certified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor(s) and accordingly discharges this guarantee.

5. We..... (indicate the name of the bank) further agree with AAI that AAI shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by AAI against in the said contractor(s) and to forebear and enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extensions being granted to the said contractor(s) or for any forbearance, act of omission on the part of AAI or any indulgence by the AAI to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to securities would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

7. We…… (Indicate the name of the bank) lastly undertake not to revoke this guarantee except with the previous consent of AAI inwriting.

8. This guarantee shall be valid upto .....unless extended on demand by AAI. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …….. (Rupees …… only) and unless a claim in writing is lodged within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

In presence of

Dated this_____Day of _____

Witness
1.
2.

For and on behalf of (The Bank)
Signature _____
Name& Designation _____
Authorization No. _____
Name & Place _____
Bank's Seal_____

The above Guarantee is accepted by Airports Authority of India. For and on behalf of Airports Authority of India
Signature_____
Name_____
Designation_____
Dated _____
Note: * Date of validity should be schedule date of completion + Six months.

APPENDIX-XI-A

Format for Letter of undertaking from the Depositor to Bank

(To be submitted along with Security Deposit / Earnest Money / Performance Guarantee to Airports Authority of India)

(To be submitted in the Letter head of the firm)

The Branch Manager,
……. Bank,
…….

Sub: - My / Our Bank Guarantee bearing No……. dated ……. for amount……. Issued in favour of Airport Authority of India A/c **ICIC0000007**

Sir,

The subject Bank Guarantee is obtained from your bank for the purpose of **Security Deposit / Earnest Money / Performance Guarantee** on account of contract awarded / to be awarded by M/s Airports Authority of India to me / us.

I hereby authorized the Airport Authority of India in whose favour the deposit is made to close the subject Bank Guarantee before maturity/ on maturity toward adjustment of dues without any reference /consent /notice from me / our side and the bank is fully discharged by making the payment to Airport Authority of India.

Signature of the Depositor

Place:

Date:

APPENDIX-XII

LIST OF ACTS AND OMISSONS FOR WHICH FINES CAN BE IMPOSED

In accordance with rule 7(v) of the AAI Contractor's Labour Regulations to be displayed prominently at the site of work both in English and local Language.

1. Willful insubordination or disobedience, whether alone or in combination with other.
2. Theft fraud or dishonesty in connection with the contractors beside a business or property of AAI.
3. Taking or giving bribes or any illegal gratifications
4. Habitual late attendance.
5. Drunkenness lighting, riotous or disorderly or in different behavior
6. Habitual negligence.
7. Smoking near or around the area where combustible or other materials are locked
8. Habitual Indiscipline
9. Causing damage to work in the progress or to property of the AAI or of the contractor.
10. Sleeping on duty.
11. Malingering or slowing down work.
12. Giving of false information regarding name, age, father's name ,etc.
13. Habitual loss of wage cards supplied by the employer's
14. Unauthorized use of employer's property of manufacturing or making of unauthorized particles at the workplace
15. Bad workmanship in construction and maintenance by skilled workers which is not approved by the Department and for which the contractors are compelled to undertake rectifications.
16. Making false complaints and/or misleading statements.
17. Engaging on trade within the premises of the establishments.
18. Any unauthorized divulgence of business affairs of the employees.

19. Collection or canvassing for the collection of any money within the premises of an establishment unless authorised by the employer.

20. Holding meeting inside the premises without previous sanction of the employers.

21. Threatening or intimidating any workman or employer during the working hours within the premises.

APPENDIX-XIII

Form-XVII [See Rule 78 (2)(d)]

Register of Fines

Name and address of contractor…….

Name and address of establishment which contractor is carried on……...

Name and location of work…….

Name and address of Principal Employer…….……

SI. No.	Name of workman	Father's/ Husband's Name	Designation n nature of employment t	Act or action for which fine imposed	Date of Offence	Whether workman showed cause against fine	Name of person in whose presence employee's explanation was heard	Wage period and wages payable	Amount of the imposed	Date on which fine realized	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

C-NIL, I-NIL, O-NIL

GCC-118

APPENDIX-XIV

Form-XVII
[See Rule 78 (2) (d)]
Register of Deduction for Damage or Loss

Name and address of contractor…….

Name and address of establishment under which contract is carried on……...

Name and location of work…….

Name and address of Principal Employer…….……

SI. No.	Name of workman	Father's Husband's Name	Designation /nature of employment t	Particular of Damages or Loss	Date of damages or loss	Whether workman showed cause against deduction n	Name of person in whose presence employee's explanation was heard	Amount of deduction n imposed	No. of installments	Date of recovery		Remark
										First Installment	Last Installment	
1	2	3	4	5	6	7	8	9	10	11	12	13

APPENDIX-XV

Form-XXII
[See Rule 78 (2) (d)]
Register of Advances

Name and address of contractor…….

Name and address of establishment under which contract is carried on……...

Name and location of work…….

Name and address of Principal Employer…….……

SI. No.	Name of workman	Father's Husband's Name	Designation /nature of employment t	Wage period and wages payable	Date and amount of advance e paid	Purpose for which advance paid	Number of installment by which advance to be repaid	Date and amount of each installment repaid	Date on which last installment was repaid	Remark
1	2	3	4	5	6	7	8	9	10	11

APPENDIX-XVI

Form-XXIII [See Rule 78 (2)(e)]

Register of Overtime

Name and address of contractor…….

Name and address of establishment under which contract is carried on……...

Name and location of work…….

Name and address of Principal Employer…….…….

S. No	Name of workman	Father's / Husbands Name	Sex	Designation/ nature of employment	Date on which overtime worked	Total overtime worked at project in case of piece rate	Normal rate of wages	Overtime rate of wages	Overtime earning	Rate on which overtime paid	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

C-NIL, I-NIL, O-NIL

GCC-121

APPENDIX-XVII

NOTICE FOR APPOINTMENT OF ARBITRATOR

[Refer Clause 25]

To

……..
……..
……..

Dear Sir,

In terms of clause 25 of the agreement, particular of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm /Partnership Firm/Ltd. Co.
3. Full address of the applicant.
4. Name of the work and contract number in which arbitrator sought.
5. Name of the office which entered into contract.
6. Contract amount in the work.
7. Date of contract.
8. Date of initiation of work.
9. Stipulated date of completion of work.
10. Actual date of completion of work (if completed).
11. Total number of claims made.
12. Total amount claimed.
13. Date of intimation of final bill (if work is completed).
14. Date of payment of final bill (if work is completed).
15. Amount of final bill (if work is completed).
16. Date of request made to ED for decision.
17. Date of receipt of ED's decision.
18. Date of appeal.
19. Date of receipt of decision on our appeal.

Specimen signature of the applicant
(Only the person/authority who
Signed the contract should sign)

I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims.
2.
3.
4.

Yours faithfully

(Signature)

Copy to:

1. The Engineer-in-charge.....,
   ……

APPENDIX -XVIII

INTEGRITY PACT

The integrity pact shall be signed by both the parties in the following format

"This Pact made this ……day of ……. between Airports Authority of India, a body corporate constituted by the Central Government under the Airports Authority of India Act,1994 and having its Corporate Office at Rajiv Gandhi Bhawan, New Delhi, and offices at ……..(Name of Airport) in India, hereinafter called the Authority (which term shall unless excluded by or is repugnant to the context, be deemed to include its Chairman, or Member, Executive Directors, Airport Directors, officers or any of them specified by the Chairman in this behalf, and shall also include its successors and assigns) of the one part

AND

M/s……(Name of bidding company) represented by …… ……..(Name of authorized person) of the other part, hereinafter called the "Bidder/Contractor "(which term shall unless excluded by or is repugnant to the context be deemed to include its heirs, representatives, successors and assigns of the Bidder/ Contractor)

WHEREAS the Authority intends to award, under laid down organizational procedures, tender/ contract for "……." The Authority, while discharging its functions on business principles, values proper compliance with all relevant laws and regulations, and the principles of natural, justice, ethics, equity, fairness and transparency in its relations with the Bidders / Contractors.

WHEREAS the Authority is desirous to make its business mechanism more transparent, thus to ensure strict adherence of the aforesaid objectives/goals, the Authority hereby adopts the instrument developed by the renowned international non-governmental organization "Transparency International" (T I) headquartered in Berlin (Germany). The Authority will appoint an Independent External Monitor (IEM) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

AND WHEREAS the Bidder is submitting a tender to the Authority for **……** In response to the **NIT (**Notice Inviting Tender number) dated …….. Contractor is signing the contract for execution of **……** NOW, therefore, To avoid all forms of corruption by following a system that is fair ,transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to Enabling the Authority to obtain the desired said stores/equipment/execution of works at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and Enabling Authority to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the Authority will commit to prevent corruption, in any form, by its officials by following transparent procedures. The parties hereto hereby agree to

enter into this Integrity Pact and agree as follows:

1. Commitments of the Authority;

1.1 The Authority undertakes that no official of the Authority, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The Authority will, during the pre-contact stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

1.3 All the officials of the Authority will report to the appropriate authority office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

1.4 In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the Authority with full and verifiable facts and the same is prima facie found to be correct by the Authority, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the Authority and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the Authority the proceedings under the contract would not be stalled.

2. Commitments of Bidders/Contractor.

The Bidder/Contractor commits itself to take all measures necessary to prevent corrupt practice, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following.

2.1 The Bidder/Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Authority, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

2.2 The Bidder/Contactor further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Authority or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contractor any other contract with the Authority for showing or forbearing to show favour or dis favour to any person in relation to the contract or any other

contract with the Authority.

2.3 The Bidder / Contactor has not entered and will not enter with other bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specification, certifications, subsidiary contracts, submission or non-submission of bids or any actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.4 The Bidder/Contractor shall, when presenting his bid, disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

2.5 The Bidder/Contactor shall when present his bid disclose any and all the payments he has made or, is committed to or intends to make to agents/brokers or any other intermediary, in connection with this bid/contract.

2.6 The Bidder/Contractor further confirms and declares to the Authority that the BIDDER is the original manufacturer/integrator/ authorized government sponsored export entity of the stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the Authority or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

2.7 The Bidder/Contractor, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made or has committed to or intends to make to officials of the Authority or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

2.8 The Bidder/Contractor will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

2.9 The Bidder/Contractor will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

2.10 The Bidder / Contactor shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the Authority as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The Bidder / Contractor also under takes to exercise due and adequate care lest any such information is divulged.

2.11 The Bidder/Contractor will inform to the Independent External Monitor.

i) If he receives demand for an illegal/undue payment/benefit.

ii) If he comes to know of any unethical or illegal payment/benefit.

iii) If he makes any payment to any Authority's associate(s)

2.12 The Bidder/Contactor commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

2.13 The Bidder/Contactor shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

2.14 If the Bidder/Contractor or any employee of the Bidder/Contractor or any person acting on behalf of the Bidder/ Contractor, either directly or indirectly, is a relative of any of the officers of the Authority, or alternatively, if any relative of an officer of the Authority has financial interest/stake in the Bidder's/Contractor's firm, the same shall be disclosed by the Bidder/Contractor at the time filing of tender. The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act1956.

2.15 The Bidder/Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Authority.

2.16 That if the Bidder/ Contractor, during tender process or before the award of the contract or during execution of the contract/work has committed a transgression in violation of section 2 or in any other form such as to put his reliability or credibility as Bidder/Contractor into question, the Authority is entitled to disqualify him from the tender process or to terminate the contract for such reason and to debar the BIDDER from participating in future bidding processes.

3. Previous Transgression

3.1 The Bidder/Contractor declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify Bidder's exclusion from the tender process.

3.2 The Bidder/Contractor agrees that if it makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason and he may be considered for debarment for future tender/contract processes.

3.3 That the Bidder/Contractor undertakes to get this Pact signed by the subcontractor (s) and associate(s) whose value of the work contribution exceeds Rs 0.5 Cr. (Rupees zero point five Cr.) and to submit the same to the Authority along-with the tender document/ contract before contract signing.

3.4. That sub-contractor(s)/ associate(s) engaged by the Contractor, with the approval of the Authority after signing of the contract, and whose value of the work contribution exceeds Rs0.5Cr. (Rupees Zero point five Cr.)will be required to sign this Pact by the Contractor, and the same will be submitted to the Authority before doing/ performing any act/ function by such subcontractor(s) / associate(s) in relation to the contract/ work.

3.5 That the Authority will disqualify from the tender process all Bidder(s) who don't

sign this Pact or violate its provisions or fails to get this Pact signed in terms of policy of authority

3.6 That if the Contractor(s) does/ do not sign this Pact or violate its provisions or fails to get this Pact signed in terms of policy of authority. Authority will terminate the contract and initiate appropriate action against such Contractor(s).

4. Earnest Money, Security Deposit, Bank Guarantee, Draft, Pay order or any other mode and its validity i/c Warranty Period, Performance Guarantee/Bond.

While submitting bid, the BIDDER shall deposit an EMD/SD/BG/DRAFT/PAY ORDER ETC I/C WARRANTY PERIOD, PG/BOND, VALIDITY etc., which is as per terms and conditions and details given in NIT / tender documents sold to the Bidders.

In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of sub-contracting, the principal contractor shall be solely responsible for the adherence to the provisions of IP by the sub-contractor(s).

5. Sanctions for Violations/Disqualification from tender process and exclusion from future Contacts.

5.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the Authority to take all or any one of the following actions, wherever required:

i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

ii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

iii) If the Authority has disqualified / debarred the Bidder from the tender process prior to the award under section 2 or 3 or 4, the Authority is entitled to forfeit the earnest money deposited/bid security.

iv) To recover all sums already paid by the Authority, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the Authority in connection with any other contract or any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

v) To en-cash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be

liable to pay compensation for any loss or damage to the Authority resulting from such cancellation/rescission and the Authority shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

vii) To debar the BIDDER from participating in future bidding processes for a period upto two years.

viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

ix) In case where irrevocable Letters of Credit have been received in respect of any contract signed by the Authority with the BIDDER, the same shall not be opened.

x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

xi) That if the Authority have terminated the contract under section 2 or 3 or 4 or if the Authority is entitled to terminate the contract under section 2 or 3 or 4, the Authority shall be entitled to demand and recover from the contractor damages equivalent to 5% of the contract value or the amount equivalent to security deposit or performance bank guarantee, whichever is higher.

xii) That the Bidder / Contractor agrees and undertakes to pay the said amount without protest or demur subject only to condition that if the Bidder / Contractor can prove and establish to the satisfaction of the Authority that the disqualification / debarment of the bidder from the tender process or the termination of the contract after award of the contract has caused no damage to the Authority.

5.2 The Authority will be entitled to take all or any of the actions mentioned at para 5.1 above.

5.3 (i) to (xii) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

5.4 That if the Bidder/Contractor applies to the Authority for premature revocation of the debarment and proves to the satisfaction of the Authority that he has installed a suitable and effective corruption prevention system and also restored/recouped the damage, if any, caused by him, the Authority may, if thinks fit, revoke the debarment prematurely considering the facts and circumstances of the case, and the documents/evidence adduced by the Bidder/Contractor for first time default.

5.5 That a transgression is considered to have occurred if the Authority is fully satisfied with the available documents and evidence submitted along with Independent External Monitor’s recommendations/suggestions that no reasonable doubt is possible in the matter.

5.6 The decision of the Authority to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent External Monitor(s) appointed for the purpose of this Pact.

6. Allegations against Bidders/Contractors/ Sub-Contractors/Associates:

That if the Authority receives any information of conduct of a Bidder/ Contractor or Sub- Contractor or of an employee or a representative or an associate of the Bidder, Contractor or Sub- Contractor which constitute corruption, or if the Authority has substantive suspicion in this regard, the Authority will inform the Vigilance Department for appropriate action.

7. Independent External Monitor(s),

7.1. That the Authority has appointed competent and credible Independent External Monitor(s) for this Pact.

7.2 The task of the Monitor(s) is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact. He will also enquire into any complaint alleging transgression of any provision of this Pact made by the Bidder, Contractor or Authority.

7.3. That the Monitor(s) is not subject to any instructions by the representatives of the parties and would perform his functions neutrally and independently. He will report to the Chairperson of the Board of the Authority.

7.4 That the Bidder / Contractor accepts that the Monitor(s) has the right to access without restriction to all project documentation of the Authority including that provided by the Bidder/Contractor. The Bidder/Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation including minutes of meeting. The same is applicable to Sub - Contractors and Associates. The Monitor is under obligation to treat the information and documents of the Authority and Bidder/ Contractor / Sub- Contractors/ Associates with confidentiality.

7.5. That as soon as the Monitor notices, or believes to notice, a violation of this Pact, he will so inform the management of the Authority and request the management to discontinue or heal the violation, or to take other relevant action. The Monitor(s) can in this regard submit his recommendations/ suggestions. Beyond this, the Monitor(s) has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

7.6 That the Authority will provide to the Monitor(s) sufficient information about all meetings among the parties related to the project provided such meetings could have an impact on the contractual relations between the Authority and the Contractor / Bidder. The parties offer to the Monitor(s) the option to participate in such meetings.

7.7 That the Monitor(s) will submit a written report to the Chairperson of the Board of the Authority within 2 weeks from the date of reference or intimation to him by the Authority and, should the occasion arise, submit proposals for correcting

problematic situations.

7.8 That if the Monitor(s) has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti- Corruption Laws of India and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Department, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

7.9 The word 'Monitor' would include singular and plural.

8. Facilitation of Investigation.

In case of any allegation of violation of any provisions of this Pact or payment of commission, the Authority or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such Examination.

9. Law and Place of Jurisdiction.

That this Pact is subject to provisions under Indian Law. The place of performance and jurisdiction is the Corporate Headquarter /the Regional Headquarter / office of the Authority, as applicable.

10. Other Legal Actions

10.1 That the changes and supplements as well as termination notice need to be made in writing.

10.2 That if the Bidder / Contractor are a partnership or a consortium, this Pact must be signed by all the partners and consortium members or their authorized representatives.

11. Pact duration (Validity)

11.1 That this Pact comes into force when both the parties have signed it. It expires for the Contractor 12 months after the final payment under the respective contract, and for all other Bidders 3 months after the contract is awarded.

11.2. That if any claim is made / lodged during this period, the same shall be binding and continue to be valid despite the lapse of this Pact as specified herein before, unless it is discharged/determined by Chairman of the Authority.

11.3 That should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

12. Company Code of Conduct

Bidders are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behavior) and a compliance program for the implementation of the code of conduct throughout the company.

13. The parties hereby sign this Integrity Pact at _____ on _____

Buyer

Sd/-
Name of the Officer: …….
Designation: ……
Deptt. / Ministry / PSU: Airports Authority of India.

Witness

1. _____

2. _____

Bidder

AUTHORISED SIGNATORY

Witness
1. _____

2._____

APPENDIX-XIX

(To be filled by Contractor)
(CLAUSE-47)

Ratio of direct payment to the specialized agency in case of composite contract agency : …% of the net payment to be made to Specialized

Sl.	**Sub-head**	**Nature of work**	**% of the net payment to be made to Specialized agency**
1	Sub-head I		

Note:

1. NIT approving authority must ensure that all sub-heads of works are covered in above table. The bidder must indicate percentage payable to specialized agency in case of all sub-heads.
2. If % is not filled in by the contractor against one or more subhead in this schedule, then 75% of the net payment admissible as per AAI for the subhead under consideration shall be paid directly to specialized agency in case of composite contract.

APPENDIX-XX

Format Consent Letter
Dispute Resolution Clause-25 Para ii (b)

To,

The Chairman/Member/Regional Executive Director,
Airports Authority of India,

SUB: Request for appointment of arbitrator under Clause-25 of the_____ agreement dated _____ for **…….**

Sir/Madam,

1. We state that _ _ ___ _ __ (contractor/agency) was awarded work of **……** (other location) of Airports Authority of India through Award Letter_____ dated __ _____

2. Dispute related to ____ ___ arose between us (contractor/agency) and AAI.

3. On _____(date), dispute was referred to Mediation as per AAI Mediation Policy and any settlement on the following claims/disputes was not reached between the parties:
(i)
(ii)
(iii)

4. A concise statement along with claim in respect of each of such disputes is attached herewith.

5. In view of the above, we invoke arbitration under clause-25 of the_ _ _ ___ ___ agreement between us and AAI and as per provision to Section-12(5) of the Arbitration & Conciliation Act, 1996, we hereby agree and request the Chairman/Member/Regional Executive Director AAI to appoint arbitrator from AAI 's panel of arbitrators.

6. I / We also give my/ our consent for appointing any of the arbitrator from AAI’s approved panel of arbitrators, as per paragraph-5 above.

Thanking you,

(_____)

Authorized signatory of _____

Encl: As above

APPENDIX-XXI

INDENTURE FOR SECURED ADVANCES

(Reference Clause 10 B)

(For use in cases in which the contract is for finished work and the contractor has entered into an agreement for the execution of a certain specified quantity of work in a given time)

THIS INDENTURE made the.... .... day of. .... 20.. ..... BETWEEN

(hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors' administrators and assigns) of the one part and the CHAIRMAN, AAI (hereinafter called the AAI which expression shall where the context so admits or implies be deemed to include his successors in office and assigns) of the other part.

WHEREAS by an agreement dated .... (hereinafter called the said agreement) the Contractor has agreed AND WHEREAS the Contractor has applied to the AAI that he may be allowed advances on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the construction of such of the works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges) AND WHEREAS the AAI has agreed to advance to the Contractor the sum of Rupees .... on the security of materials the quantities and other particulars of which are detailed in Accounts of Secured Advances attached to the Running Account Bill for the said works signed by the Contractor on .... and the AAI has reserved to himself the option of making any further advance or advances on the security of other materials brought by the Contractor to the site of the said works. Now THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees .... on or before the execution of these presents paid to the Contractor by the AAI (the receipt whereof the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as aforesaid the Contractor doth hereby covenant and agree with the AAI and declare as follows: -

1. That the said sum of Rupees. .... so advanced by the AAI to the Contractor as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the Contractor in or towards expediting the execution of the said works and for no other purpose whatsoever.
2. That the materials detailed in the said Account of Secured Advances which have been offered to and accepted by the AAI as security are absolutely the Contractor's own property and free from encumbrances of any kind and the contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnifies the AAI against all claims to any materials in respect of which an advance has been made to him as aforesaid.
3. That the materials detailed in the said Account of Secured Advances and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the Engineer-in-Charge of the project (hereinafter called the Engineer-in-Charge) and in the term of the said agreement.
4. That the Contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and on his own responsibility and shall at all times be open to inspection by the Engineer-in-Charge or any officer authorised by him. In the event of the said materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree than is due to reasonable use and wear thereof the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same as required by the Engineer-in-Charge.
5. That the said materials shall not on any account be removed from the site of the said works except with the written permission of the Engineer-in-Charge or an officer authorised by him on that behalf.
6. That the advances shall be repayable in full when or before the Contractor receives payment from the AAI of the price payable to him for the said works under the terms and provisions of the said agreement.

Provided that if any intermediate payments are made to the Contractor on account of work done than on the occasion of each such payment the AAI will be at liberty to make a recovery from the Contractor's bill for such payment by deducting there from the value of the said materials then actually used in the construction and in respect of which recovery has not been made previously, the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

7. That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the AAI shall immediately on the happening of such default be repayable by the Contractor to the President together with interest thereon at twelve per cent per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs charges, damages and expenses incurred by the President in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the President to repay and pay the same respectively to him accordingly.
8. That the Contractor hereby charges all the said materials with the repayment to the President of the said sum of Rupees .. .. and any further sum or sums advanced as aforesaid and all costs charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and whenever the covenant for payment and repayment herein before contained shall become enforceable and the money owing shall not be paid in accordance therewith the AAI may at any time thereafter adopt all or any of the following courses as he may deem best :-

a) Size and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractor, he is to pay same to the MI on demand.

b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the MI under these presents and pay over the surplus (if any) to the Contractor. Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

9. That except in the event of such default on the part of the Contractor as aforesaid interest on the said advance shall not be payable.
10. That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been herein before expressly provided for the same shall be finally resolved as per provisions of clause 25 of the contract.

In witness whereof the said ..... and ..... by the order and under the direction of the AAI have hereunto set their respective hands the day and year first above written.

Signed, sealed and delivered by ..... the said contractor in the presence of

Signature .....

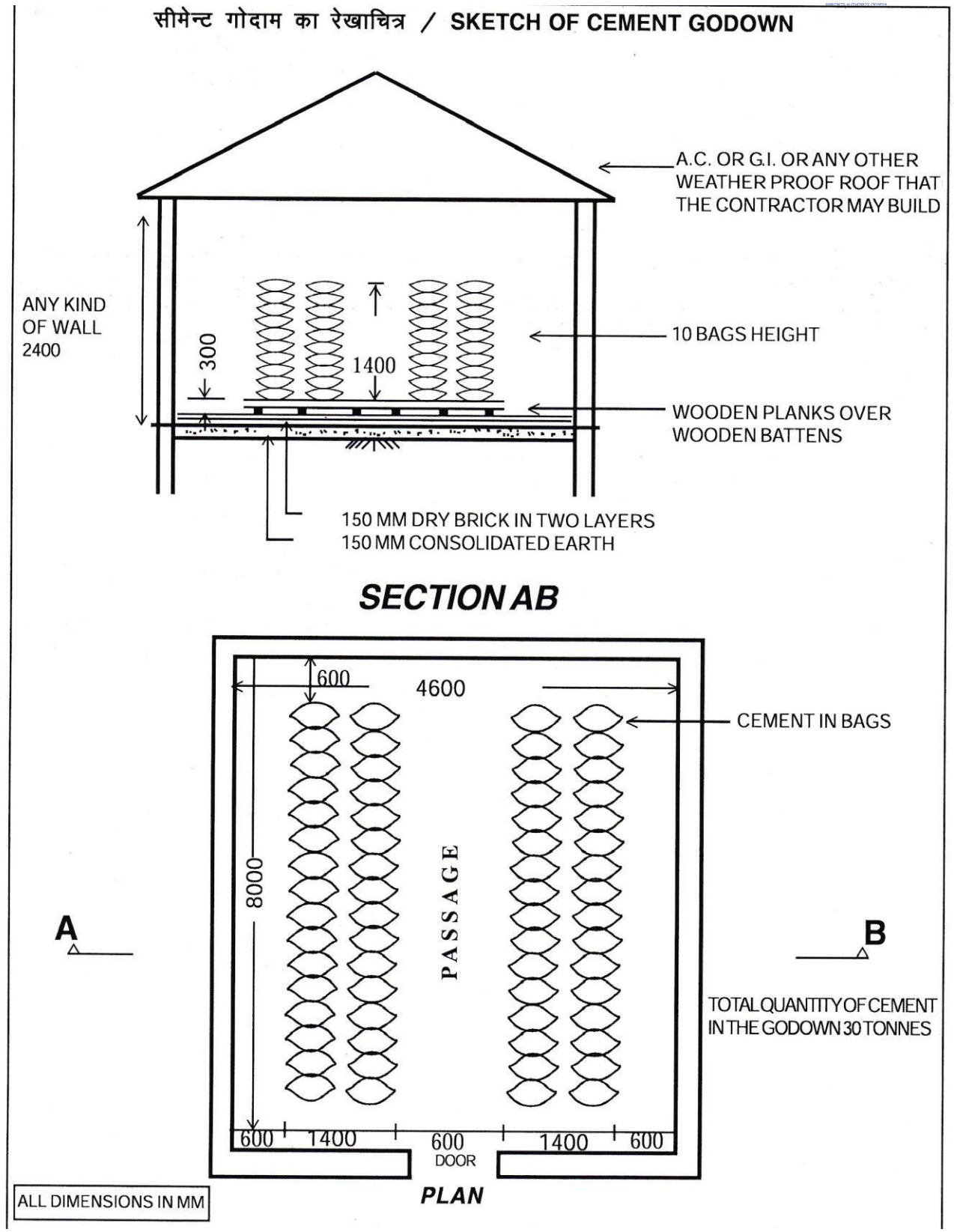
Witness Name .....

Address .....

Signed by .....

by the order and direction of the AAI in the presence of

Signature .....
Witness Name .....
Address ....



SKETCH OF CEMENT GODOWN

C-NIL, I-NIL, O-NIL **GCC-136**

SCHEDULES

SCHEDULE `A'

All rates shall be quoted in the format provided and no other format is acceptable. The price bid has been given as a standard BOQ format at page no. SOQ 01 to SOQ 12 with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the File name. if the BOQ file is found to be modified by the bidder, the bid will be rejected and EMD shall be forfeited.

SCHEDULE `B'

Schedule of materials to be issued to the contractor.

Sl. No.	Description of Item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of Issue
1	2	3	4	5
			Not Applicable	

SCHEDULE `C'

Tools and plants to be hired to the contractor.

Sl. No.	Description	Hire charges per day	Place of Issue
1	2	3	4
		Not Applicable	

SCHEDULE `D'

Extra schedule for specific requirements/ documents for the work, if any. Please refer Special Condition of Contract (as applicable).

SCHEDULE `E'

Reference to General Condition of contract

Name of work: **Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.**

SH: **Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)**

i.	Estimated cost of work:	**Rs. ₹ 33.19 Crores (Excluding GST)**
ii.	Earnest Money:	**Rs. ₹ 99,60,000/-**

iii.	Performance Guarantee:	5% of contract value
iv	Additional Performance Guarantee:	As per Clause 1B of GCC
v.	Security deposit:	5% of contract value.

SCHEDULE `F'

GENERAL RULES & DIRECTION

Officer inviting tender: Senior Manager (Engg.-Civil) (Bid Manager), Airports Authority of India, O/o ED (Engg.)-ER, 2nd Floor, Old R. D. Building, Safdarjung Airport, New Delhi – 110003.

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2& 12.3	Refer Clause 12 below for details.

Definitions:

Office inviting tender	Senior Manager (Engg.-Civil) (Bid Manager), Airports Authority of India, O/o ED (Engg.)-ER, 2nd Floor, Old R. D. Building, Safdarjung Airport, New Delhi – 110003
2(v) Engineer-in-Charge	DGM/ Jt. GM (Engg. - Civil), Valmiki Nagar Airport.
2(viii) Accepting Authority	As per AAI's DOP
2(x) Percentage on cost materials &Labour to cover all overheads & Profits	15%
2(xi) Standard schedule of rates	AAI rate analysis for pavement works, MoRTH Standard Data Book for pavement items and CPWD DSR 2023 with up to date correction slips as on last date of submission of tenders & market rates for other items in the same order of preference.
2(xii) Department	AAI, Engineering

Clause 1

(i)	Time allowed for submission of Performance Guarantee from the date of issue of letter for Intent	Within 30 Days
(ii)	Maximum allowable period of extension	As per Clause-1 of GCC

Clause 2

	Authority for fixing compensation under Clause 2	ED(Engg)- ER

Clause 2A

	Whether Clause 2A shall be applicable	No

Clause 5

	Number of days from the date of issue of letter of acceptance for reckoning date of Start	10 days

Mile Stone(s) as per table given below:

Sl. No.	Description of Milestones (Physical)	Time allowed in days (from date of start)	Amount to be withheld in case of non-achievement of milestone
	AS PER CLAUSE NO. 5 OF GCC AND SPECIAL CONDITION OF CONTRACT		

Time allowed for execution of work: 12 months (including 02 months for rain).

Authority to decide:

i. Extension of time	As per DOP
iii. Rescheduling of milestone	Executive Director (Engg.), AAI
iii. Shifting of date of start in case of delay in handing over of site	Executive Director (Engg.), AAI

Clause 6, 6A

Clause applicable – (6 or 6A)	**Clause 6A is Applicable**

Clause 7

Gross work to be done together with net payment/adjustment of advances for material collected, if any since the last such payment for being eligible to interim payment.	**Monthly**

Clause 10A

Testing equipment to be provided by the contractor at site lab

All the Testing equipments required for conducting test for works as per CPWD, IE Rules, BCAS, CPCB, MoRTH, IRC and Tender specifications as applicable.

Clause 10 B (ii)

	Whether Clause 10B(ii) shall be applicable	Yes
	Interest on Mobilization Advance	8.75 % Per Annum

Clause 10 C: Applicable

Component of labour expressed as percent of value of work: 5% (Five Percent)

Clause 10 CA - (Not Applicable)

~~Materials covered under this clause~~	~~Nearest Material **(other than cement*, reinforcement bars, structural steel & Bitumen)** for which All India Wholesale Price index is to be followed~~	~~Base price and its corresponding period of all the materials covered under clause 10CA~~
~~1. Cement (OPC/ PPC)~~		~~Base price for cement and reinforcement steel to be determined as issued under authority of DG (Works). CPWD or concerned Zonal Chief Engineer, CPWD as on last date of receipt of tender. In case base price for cement, reinforcement steel and Bitumen as to be issued by CPWD is not available concerned ED (Engg) empowered to determine the same.~~
~~2. Reinforcement steel bars (TMT)~~		
~~3. Structural Steel~~		
~~4. Bitumen~~		

~~***Note:***~~

~~1. Includes cement component used in RMC brought at site from outside approved RMC plants, if any.~~

~~2. Base price and its corresponding period of all the materials covered under clause 10CA is to be mentioned at the time of approval of NIT. In case of recall of tenders, the base price may be modified by adopting latest base price and its corresponding period.~~

Clause 10 CC - (Not Applicable)

Clause 10CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column	18 Months

A. For Construction Period

S. No.	**Relevant component of Material / Labour for price escalation**	**% Percentage against total value of work**

1	**Cement component**	
2	**Labour component**	
3	**Civil Component of other Construction Materials**	
4	**E & M (Electrical and Mechanical i/c IT & Airport System / component of Construction Materials)**	
5	**Component of POL (Diesel component)**	
6	***Reinforcement steel bars / TMT bars / structural steels (including strands and cables) component**	
7	**Bitumen component**	
	Total	**100%**

***% of components to be decided by NIT approving authority for particular tender and as per TI 141 Dtd. 07.02.24.**

B. For Operation & maintenance period

S. No.	**Relevant component of Material / Labour for price escalation**	**% Percentage against total value of work**
1	**Labour component**	
2	**Civil Component of the Construction Materials**	
3	**E & M (Electrical and Mechanical i/c IT & AS) / component of Construction Materials)**	
4	**Bitumen component (For Pavement work component)**	
	Total	**100%**

***% of components to be decided by NIT approving authority for particular tender and as per TI 141 Dtd. 07.02.24.**

Clause11

Specification to be followed for execution of work	a) AAI's Specification for Flexible/Rigid Pavement b) CPWD Specification 2019, Vol. I to II with upto date correction slips, MORTH or other specification as applicable. c) Technical specification. d) As per BCAS/DGCA Guidelines. e) As per manufacturer's Specification.

Clause12

12.2 & 12.3	Deviation limit beyond which clauses 12.2 & 12.3 shall apply for buildings, pavements and all other works above foundation level.	15% (Fifteen Percent)
12.5	Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work	100% (Hundred Percent)
	Overall Deviation i/c extra items, if any.	30% (ThirtyPercent)

Clause16

	Competent Authority for deciding reduced rates	DGM/ Jt.GM(Engg)

Clause 17

Defect Liability Period : Eleven (11) Months after the completion of work

Clause18

Mandatory machinery tools & plants to be deployed by the contractor at site:

To be provided as per NIT/SCC and other Machinery required for timely completion of work.

Clause 25

Place of Arbitration: New Delhi

Clause 36(1)

Requirement of Minimum Technical Representative(s) and recovery rate:

Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical representative)	Minimum Experience	Number	Rate at which recovery (each per day) shall be made from the contractor in the event of not fulfilling provision of clause 36	
						Figures Rs.	Words
1.	Graduate in Engineering	Civil	Project-in-charge	10	01	10,000	Ten Thousand
2.	Graduate/ Diploma in Engineering	Civil	Site Engineer	5 or 8 respectively	02	6000	Six Thousand
3.	Graduate/ Diploma in Engineering	Electrical	Site Engineer	5 or 8 respectively	01	6000	Six Thousand
4.	Graduate/ Diploma in Engineering	Civil	Quality Control Engineer	2 or 5 respectively	03	5000	Five Thousand
5.	Diploma in Engineering	Civil	Surveyor	3	02	5000	Five Thousand

a. Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.
b. Diploma holder with minimum 10-year relevant experience with a reputed construction company can be treated at par with Graduate Engineer for the purpose of such deployment subject to the condition that such diploma holder should not exceed 50% of requirement of degree engineers.
c. Deployment of Engineer/other professionals shall be as per Deployment program submitted by agency positively within fifteen days of issue of work order & agreed upon by Engineer-in-Charge.
d. Recovery shall be based on the approved deployment program of Engineer/other professionals

Clause 37
License Fee for unpaved land Please refer SCC

Clause 41(b)
Integrity Pact Applicable Yes

Clause 42

(i)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates	DSR 2023 printed by C.P.W.D with up-to-date correction slips till last date of submission of tender, technical specifications & BOQ.
(ii)	Variations permissible on theoretical quantities	
a.	Cement for works with estimated cost put to tender not more than Rs.5lakhs.	3% plus/minus
	For works with estimated cost put to tender more than Rs.5lakhs	2% plus/minus
b.	Steel Reinforcement and structural steel section for each diameter, section and category	2% plus/minus
c.	Bitumen	2.5% plus only & NIL on minus side
d.	All other materials	

RECOVERY RATES FOR QUANITITES BEYOND PERMISSIBLE VARIATION

Sl. No.	**Description of items**	**Rates in figures and words at which recovery shall be made from the contractor**	
		Excess beyond permissible variation	Less use beyond the permissible variation*
1.	Cement	Not Applicable	Not permitted
2.	Steel reinforcement	Not Applicable	Not permitted
3.	Structural Sections	Not Applicable	Not permitted
4.	Bitumen issued free	Not Applicable	Not permitted
5.	Bitumen issued at stipulated fixed price	Not Applicable	Not permitted

* Provided work is considered technically sound. Otherwise work has to be re-executed as per direction of Engineer-in-charge

Clause 48
Escrow Account: Not applicable.

SPECIAL CONDITIONS OF CONTRACT (CIVIL)

1. **GENERAL**

Special conditions of Contract shall be read in conjunction with General Conditions of Contract, Technical Specifications, Drawings and any other documents forming part of this contract wherever the context so requires.

Notwithstanding the sub-division of the documents into these separate sections and volume every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the CONTRACT so far as it may be practicable to do so.

Where any portion of the General Condition of Contract is repugnant to or at variance with any provisions of the Special Conditions of contract, unless a different intention appears the provisions of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall to the extent of such repugnancy, or variations, prevail.

Nothing extra shall be payable on account of various activities to be performed as per special conditions of contract except where so specified.

A. SPECIAL CONDITIONS FOR CIVIL WORKS

i. The work in general shall be carried out as specified in the nomenclature of the item and/ or in order as per the (i) Technical Specifications (ii) AAI specifications (iii) MoRTH specifications, (iv) CPWD specifications 2019 Volume I to II with up to date correction slips, and (v) Manufacturer's specifications.

ii. For item not covered under AAI specifications, MoRTH specifications, CPWD Specifications 2019 Volume I & II with up to date correction slips and Manufacturer's specifications, the work shall be done as per latest relevant BIS / IRC Codes of Practice.

iii. If there is any difference/discrepancy or contradiction in the provision of the said specification of the item of work and the description of the item given in the schedule of quantities, the scope of the item shall be taken according to the following order of preference.

1. Nomenclature of item as given in the schedule of quantities.
2. AAI specifications & special condition, if any
3. Drawing/Sketch, if any referred in the nomenclature of items.
4. MoRTH Specifications
5. CPWD specifications
6. Manufacturer's specifications
7. Relevant BIS/IRC Code of practice (latest revision)/ASTM Standards**.**
8. General drawings.
9. Sound engineering practice as directed by the Engineer-in Charge whose decision in this regard shall be final and binding on the contractor.

2. INSPECTION OF SITE

For the purpose of inspection of site and relevant documents the contractor is required to contact the Bid Manager who shall give reasonable facilities for inspection of the same. The contractor shall be deemed to have satisfied himself as to the nature of the site of work, local facilities of access, availability of materials and all other matters affecting his prices for the execution and completion of work. He is required to make himself fully acquainted with the nature and scope of work. In case, if any prospective bidder has not inspected the work site prior to making his bid, he would be deemed to have acquainted himself with all the aspects, nature and scope of work.

3. ADMISSION TO SITE

Valmiki Nagar Airport is a Non-Operational Airport. The contractor is expected to finish the work by adequate planning as per the satisfaction of Engineer-in-charge.

4. SUFFICIENCY OF TENDER: -

A. Particulars and data furnished in the various sections of the tender documents need not be taken as complete by themselves. They are intended to serve as rough guidance only for the contractors to quote for the item rate tender. The tenderer shall, therefore, in their own interest examine the drawings, conditions of contract and specifications of work furnished in the tender documents. They shall also inspect the site and satisfy themselves on their own as to the hydrological, climatic and physical conditions prevailing at site, the nature, extent and practicability of works, all existing and required roads and other means of communications and access to site, royalties and ferry charges, if any, probable site for labour camps, stores and godown etc.

B. They shall also obtain for themselves all necessary information as to risks, contingencies and other circumstances which may affect or influence their tender. No extra charges consequent on any insufficient appreciation or otherwise shall be allowed. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the schedule of works/ items, quantities or in bills of quantities which rates and price shall except as otherwise provided cover all his obligations under the contract and all matters and things necessary for the proper completion and maintenance of the work.

C. Should there be any discrepancy in or any doubt or obscurity as to the meaning of any of the tender documents, clarification should be sought for in writing sufficiently in advance of the last date fixed for the receipt of the tender from the concerned bid Manager. The department will have a right to make any amendments in the tender documents and any such changes will be intimated to the tenderer well before the date fixed for receipt of tender.

5. CONTRACTOR'S REPRESENTATIVES, AGENTS AND WORKMEN/ WORK WOMEN

a. The contractor shall employ only Indian Nationals and verify their antecedents and loyalty before employing them on the work. He shall ensure that no person of doubtful antecedents and nationality is in any way associated with the work.

b. The contractor shall, on request from the Engineer-in-Charge promptly cease to employ in connection with the contract and replace any person whose continued employment in connection there with is in the opinion of the Engineer-in-charge undesirable. He shall not be re-employed in connection with the contract without the written permission of the Engineer-in-charge. The decision of the Engineer-in-charge upon any matter arising under these conditions shall be final and conclusive.

6. STORES AND MATERIALS: -

a) All the stores and materials except the materials stipulated for issue by the Authority required for the satisfactory completion of the work shall be arranged by the contractor from his own sources/ open market. No claim whatsoever shall be entertained by the Authority on account of delay in either providing these materials or non-availability of these materials in the market.

b) The contractor shall, upon demand forward for the Engineer-in-charge's inspection, test certificates rendered by the suppliers for all materials furnished by the contractor.

c) The contractor shall obtain the approval of the Engineer-in-charge, of samples of all materials to be used in the work and shall deposit these samples with him before placing an order for the materials samples. Fresh samples shall be deposited with the Engineer-in-charge whenever the type of source of any materials changes.

d) The Engineer-in-charge shall have power to cause the contractor to purchase and use such materials from any particular source, as may, in his opinion, be necessary for the proper execution of the work.

e) **The Copy of invoice for purchase of cement, Bitumen, steel and other important materials shall be submitted to the Engineer-in-charge for every lot of cement, Bitumen/ steel brought at site along with manufacturer's test certificate**.

7. CONSUMPTION OF CEMENT/ BITUMEN/ STEEL

Proper record of daily consumption of cement, steel and Bitumen etc. shall be maintained at the site of work for as directed by the Engineer-in-Charge.

8. LICENSE FEE FOR LAND ALLOTTED BY AAI

The contractor shall not be permitted to enter in (other than for inspection purpose) or take possession of the site until instructed to do so by the Engineer-in-charge in writing. The portion of the site to be occupied by the contractor shall be defined and /or marked on the site plan, failing which these shall be indicated by the Engineer-in-charge at site and the contractor shall on no account to be allowed to extend his operations beyond these areas. In respect of any land allotted to the contractor for purpose of or in connection with the contract, the contractor shall be issued a license subject to the following and such other terms and conditions as may be imposed by the licenser: -

i. Land/space (Paved/ Unpaved/ Covered-AC or Non-AC), to the extent allotted to contractors during execution of work for the purpose of installation of plants, labour camps, cement godown, site office, stacking of materials shall be provided at free of cost upto defect liability period/ Maintenance period.

ii. A security deposit at the rate of Rs 500/- per sqm in the form of DD/BG shall be deposited by the contractor. In case contractor do not deposit security deposit same shall be deducted from 1st Running Account Bill.

iii. Such security deposit shall be released only after allotted land has been fully vacated by the contractor to entire satisfaction of Engineer-in-Charge. If contractor fails to vacate the allotted land/ space (Paved/ Unpaved/ Covered-AC/ Non-AC) after Defect Liability Period/ Maintenance Period of the work shall be charged as per prevailing licence fee of the airport plus 25% penalty over that.

iv. That such use or occupation shall not confer any right of tenancy of the land to the contractor.

v. That the contractors shall be liable to vacate the land on demand by the Engineer-In-Charge.

vi. That the contractor shall have no right to any construction over this land without the written permission of the Engineer-In-Charge. In case, he is allowed to construct any structure he shall have to demolish & clear the same before handing over the completed work unless agreed to the contrary.

9. ARRANGEMENT TO BE MADE BY THE CONTRACTOR AT SITE

a) Necessary registers and stationeries required for entering data and test result shall be provided by the contractor at his own cost as directed by the Engineer-in-charge.

b) The agency is also required to provide safety devices to the other manpower (male/female) deployed at site for the work as detailed below: -
   a. Safety helmets, safety jackets and foot wears are to be provided as per requirement and nature of job to all male/female workers.
   b. Safety belts, protective Goggles, Hand gloves etc are to be provided as per requirement and nature of job to all male/female workers.

10. STACKING OF MATERIALS:

The contractor shall stack materials at the area allotted at site of work strictly as per instructions of the Engineer-in-Charge keeping in view the operational requirements of the Director General of Civil Aviation and AAI. This storage site/ yard need not necessarily be in the perimeter/ proximity of the work site and nothing extra shall be paid on this account.

a) AAI reserves full right to vacate the land without any notice if the site is required by AAI anytime during the period of allotment.
b) The contractor will vacate the area immediately on expiry of the license and handover vacant possession of the area to AAI.
c) The final bills of the contract will not be settled unless the area is vacated and handed over to AAI in vacant possession on expiry of license.
d) The contractor will ensure that no unauthorized construction comes within the area allotted.
e) The allotment will be only for the existing contract with AAI and will not be extended for any other contract.
f) A proper agreement would be got executed with the contractor for stacking construction materials and labor huts for a specific period.
g) Land shall be allotted with clear understanding that AAI reserve right to get vacated the land without any notice if the land is required by AAI any time during the period of allotment.

11. CO-ORDINATION:

The contractor shall co-operate with Authority's other contractors, compare plans, specifications and the time schedules and so arrange his work that there will be no interference. The contractor shall forward to the Engineer-in-charge all correspondence and drawings so exchanged. Failure to check plans and conditions will render the contractor responsible for bearing of any subsequent change found necessary.

12. LAND FOR LABOUR CAMPS:

No labour camp shall normally be permitted on the AAI lands without prior approval of Engineer-in-Charge. On receipt of the written request from the contractor, the use of land for the labour camp may however be allowed (if available) by the Engineer-in-Charge in consultation with the Airport Director of the Airport duly marked and delineated on a plan. The land required for labour huts need not necessarily be in the proximity of the construction site and nothing extra shall be paid on this account. This land shall be fenced by the contractor at his own cost. Before handing over the possession of land to the contractor a security deposit of **Rs. 500/-** per sqm either in DD or in form of Bank guarantee shall be submitted by the contractor for this purpose. The provision of this facility is absolutely temporary till the completion of work and will not be continued, in any manner whatsoever as having transferred the possession of land to the contractor or any person or labour of the contractor. It is further agreed between the parties that the land shall always be available to AAI during this period at the absolute discretion of

the Engineer-in-Charge. On completion of the project, the huts, installations and offices etc., shall be removed by the contractor and vacant possession of land shall be handed over to the Engineer-in-Charge.

If any construction be found outside the area earmarked, this shall be treated as unauthorized construction.

13. POWER SUPPLY:

If spare power supply is available with Airports Authority of India at **Valmiki Nagar Airport,** the same shall be made available and recovery shall be made for the units consumed at prevailing rates**.** If no spare power supply is available with AAI, the power supply has to be arranged by the contractor from State Electricity Board or has to make his own arrangement for Generators sets for running his machineries etc. Nothing extra will be paid on this account.

14. STANDARD OF WORKMANSHIP:

To determine the acceptable standard of workmanship, the contractor shall execute a portion of the items of works as a sample for approval of the Engineer- in-Charge before taking up the actual execution of the particulars item of work. These samples on approval of the Engineer-in-Charge shall be guiding samples for execution of the particulars item of work. Work not conforming to approved samples shall be rejected. The cost of samples is to be borne by the contractor.

15. PROGRAMME OF CONSTRUCTION OF WORKS, PROGRESS REPORT AND PERFORMANCE

i. PERT CHART (Bar Chart) & Network/ CPM chart

The contractor shall submit Bar/ PERT chart/Network within fifteen (15) days from date of the acceptance letter. The same shall be got approved from the Engineer-in-Charge before starting of the works and shall be binding on the contractor. In case of non-submission of the Bar/ PERT/Network & CPM Chart by the contractor within fifteen days as stated above, AAI shall get it done from any consultants at the risk and cost of the contractor and the programme/ Bar/ PERT /Network chart so prepared shall be binding on the contractor. A recovery as per GCC clause 5 will be affected for non-submission of detailed Bar/ PERT /Network chart indicating methodology & Sequence of activities as decided by Engineer-in-charge.

The contractor shall also submit a monthly progress report of the activities with reference to the approved Bar/ PERT/Network chart by 5th of every month, failing which a recovery as per GCC clause 5 shall be levied on the contractor. The decision of the Engineer-in-Charge shall be final and binding in this regard on the contractor, without prejudice to the rights of the Authority under the Agreement. Based on the evaluation by the Engineer-in-Charge and / or his representative of the progress reports submitted, the contractor shall take necessary corrective measures to adhere to the

programme, to achieve the required progress and timely completion. In case the contractor fails to take corrective measures, he shall make himself liable for action under clause 2 and/ or clause 3 of the contract.

ii. PERFORMANCE:

a) The contractor shall perform all works in substantial and acceptable manner in accordance with the plans and specification and in accordance with such further explanatory drawings, details and instructions as may from time to time be given by the Engineer-in-Charge. The work must be proceeded within such sections and such times as directed by the Engineer-in-Charge.

b) The contractor shall provide and do everything necessary for the proper execution of the works according to the true intent and meaning of the drawing and specification taken together the same may or not be particularly shown on the provided that the same can be reasonably inferred there from. Figured dimensions to be followed in preference to scale dimensions and all particulars to be taken from the actual work.

c) It must be clearly understood that the whole of the conditions are intended to be strictly enforced and that no extra charges in respect of extra work will be allowed unless they are clearly outside the spirit and meaning of the conditions or unless such works shall have been ordered in writing by the Engineer-in- Charge.

iii. PROGRAMME OF CONSTRUCTION:

a. Time is the essence of the contract and it shall be clearly understood that the tenderer has a definite programme to carry out the work within the time limit set. The time of completion stipulated in the contract covers the rainy season and no extension of time on account of dislocation due to rains during the above-mentioned period will be granted.

b. Immediately after the conclusion of the agreement and before the work is started, the contractor shall furnish in writing for approval, to the Engineer-in- Charge a programme of his proposed general and detailed arrangement for carrying out the works and of the time, order and manner in which it is proposed to execute the various sections of the work.

iv. PROGRESS OF WORKS:

a) Contractor shall give the Engineer-in-Charge a monthly or other periodical of the work done during that period.

b) Contractor shall give everyday report on category wise labour and equipment deployed along with the progress of work done on previous day in the specified proforma.

c) It shall be ensured that the works are carried out according to the agreed programme and no changes are made except with the prior approval or at the instance of the Engineer-in-Charge.

d) The progress of work will be reviewed regularly by the Engineer-in-Charge with the contractor and shortfalls, if any sorted out. The contractor shall thereupon take such actions as may be necessary to bring back his work to schedule without additional cost to the department either by employing overtime operation, increasing the number of shifts, capacity of equipment or as otherwise directed by the Engineer-in-Charge.

e) Should the work be suspended by reason of rain, strike, lockouts or other cause, the contractor shall take all precautions necessary for the protection of the work at his own expenses shall make good any damage arising from any of these causes.

f) The contractor shall furnish to the Engineer-in-Charge twelve photographs as appropriate per month of the spots indicated by him to show the progress of the work. Two photographs shall be pasted on one sheet and these sheets shall be kept in a folder for record. The photographs shall be taken from selected reference points in such manner, so that the progress of work is noticeable/ perceivable.

16. BYE – LAWS

The contractor shall comply with all bye-laws and regulations of local and statutory authorities having jurisdiction over the works and shall be responsible for payment of all fees and other charges and the giving and receiving of all necessary notice and keeping the Engineer-in-Charge informed of the said compliance with the bye-laws, payment made, notices issued and received.

The contractor shall indemnify the **AIRPORTS AUTHORITY OF INDIA** against all claims in respect of patent, design, trademarks of name or other protected rights in respect of any plant, machine work or material used for or in connection with the work or temporary works and from and against all claims, demands, proceedings, cost, charges, and expenses whatever in respect of or in relation thereto.

The contractor shall defend all actions arising from such claims and shall himself pay all royalties, license fees, damages, cost and other charges of all every sort that may be legally incurred in respect thereof. Environmental and other clearances required shall be obtained by the contractor at his own cost for installation of plants and machinery and other equipment.

Contractor/ Agency shall ensure that each workmen deployed at site should be registered with EPF authorities and should have UAN number. The contractor/ agency should submit details of PF deducted of the workmen to AAI on monthly basis. These requirements are in addition to the GCC clause 19(L)

Contractor/ Agency shall also ensure that all labour deployed at site should be registered with ESI authorities. The contractor/ agency should submit details of ESI deducted of the labour to AAI on monthly basis. These requirements are in addition to the 19(L).

17. SITE PRECAUTIONS:

a) Strict precaution must be exercised by the Contractor to avoid interference with aircraft operation on that portion of the aerodrome not closed off to aircraft traffic. Where there are restrictions of movement imposed by the Civil Aviation department and AAI, the contractor shall abide by all rules and regulation laid down in this regard by the Department and the authority.

b) It will be the responsibility of the contractor to see that air traffic control tower signals are instantly and rigidly observed and acted upon by all personnel employed by the contractor on the job.

i. With regard to construction safety measures, the contractor shall adhere to Indian Standard codes of practice, requirements of provincial Government and local Municipal authorities wherever the provisions of the latter two agencies shall be more stringent than the provisions of the former. When these codes do not exist, the contractor shall adhere to such safety measures as directed by the Engineer-in-charge.

ii. Barricading / partition required for execution of work is in the scope of the bidder. The successful bidder shall provide barricades at his own cost as per the requirement of IAF / AAI to segregate the working area to ensure safety of all concerned. The barricading shall remain to be the property of the contractor on completion of the work. Nothing extra shall be paid on this account.

iii. The contractor shall be responsible for any damage, resulting from his operations, to existing airport fixtures such as underground cable, contact lights, hard surface areas, water mains, other operational installations, airports roads, etc. The contractor shall restore, replace or repair any such damage to the complete satisfaction of the Engineer-in-charge. The Engineer-in-charge will stake out or inform the contractor as to the location of such underground cables, pipes, ducts, etc. and in this regard, the Engineer-in-charge should be advised in sufficient time ahead as to what areas the contractor may be operating on.

iv. If any time during the execution of work and for any reasons whatsoever there is some difficulty in availability of site, the contractor shall adjust his labour accordingly and no claim shall be entertained on this account.

v. No labour huts shall be permitted to be constructed inside the operational area.

vi. Contractor shall be responsible for the police and antecedent verification of the labour employed by him in the operational area and shall indemnify the department of any security problems arising thereof.

vii. As a safety measure all contractor personnel's working in operational area are supposed to wear coloured high visibility jackets. Wearing of coloured high visibility jackets in the operational area is mandatory.

18. CONTRACT DOCUMENT: -

The agreement shall be executed on a non-judicial stamp paper of appropriate value of Rs. 100/- (One Hundred Only) and the cost of the stamp paper shall be borne by the contractor.

Contractor's tender including the letters of clarifications between the contractor and the AAI prior to the award of contract shall form a part of the Contract Agreement to the extent they have been accepted by AAI.

19. DAMAGE/ DEFECTS LIABILITY: -

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building which they may be working on any building road Kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post, or wires, trees, grass or grassland, cultivated ground or any pavement contiguous to the premises on which the work of any part of it is being executed or if any damage shall happen to the work while in progress from any cause whatsoever, the contractor shall upon a receipt of a notice in writing in their behalf make the same good at his own expense or in default the Engineer-in-charge may cause the same to be made good by the other workmen and deduct the expense from any sums that may be then or at any time thereafter may become due to the contractor or from his security deposit.

The defects liability period shall be reckoned in the case of this work as **12 months (Twelve months)** from the date of completion of work and it shall be liability of the contractor to repair, strengthen or reconstruct at his own expense any portion of the work which has shown damages or any defect arising out of any bad workmanship or defective material being used for the work. In the case of rectification not being commenced by the contractor within 7 days from the date of notice from the Engineer-in-charge, the Engineer-in-charge reserves the right to get the repair work executed at the risk and cost of the contractor.

The security deposit of the contractor shall not be refunded before the expiry of defect liability period or till the final bill has been prepared and passed whichever is later.

The contractor shall not be entitled for any payment whatsoever on account of above special conditions of contract.

20. The Contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards day and night, speed limit board, red lights and providing barriers. He shall be responsible for all damages and accidents caused due to negligence on his part. No, hindrances shall be caused to traffic during execution of work.

21. The Contractor shall at his own expense, provide all materials required for the works other than those which are to be supplied by AAI. The contractor shall deposit royalty and obtain necessary permit for collection of moorum, local earth, stone, sand, red bajri, kankar, local kopra etc. from the local authority in the matter and will abide by the notification issued by Central

Govt./ State Government/ Local State Authorities as applicable from time to time in this regard. The challan for royalty paid to concerned government body shall be submitted to Engineer-in-charge. The contractor is also bound to allow deduction from his bills any difference in statutory taxes/ royalty and penalty proposed by Local State Authorities to AAI till finalization of settlement of all demands in this regard by Central/ State Govt.

22. For items pertaining to building work the specification detailed under relevant subheads for building work shall be followed.

23. All incidental charges of any kind whatsoever including cartage, storage, cutting and wastage etc. shall be borne exclusively by the contractor and nothing extra shall be payable to him on this account.

24. All material obtained from AAI stores or otherwise shall be got checked by the Engineer-in-Charge of the work on receipt of the same at site before use.

25. No payment will be made to the contractor for damage caused by rain or other natural calamities during the execution of the work and no such claim on this account will be entertained.

26. The contractor shall adjust his labour, staff, plant machinery etc. according to the requirement of work from time to time and no claim shall be entertained on account of idle labour, plant, machinery etc. due to any reason whatsoever.

27. RCC WORKS:

The centering and shuttering for all CC/ RCC works shall be of steel or ply wood of approved thickness and quality. The design of centering and shuttering for the work shall be got approved from the Engineer-in-charge before starting the work.

28. TESTS:

The various tests as indicated in the Technical Specification, AAI specifications, MoRTH specifications, CPWD specifications or BIS, as considered necessary by the Engineer-in-Charge shall be carried out in the laboratory as approved by the Engineer-in-Charge. The contractor shall bear the entire cost of samples, testing charges, carriage and any other incidental expenditure incurred, thereon. The result shall be final and binding on the contractor.

Rebound Hammer Test/Ultrasonic Pulse Velocity Test (UPV) (if required by Engineer-in-charge) shall also be conducted in addition to other mandatory tests prescribed for testing and acceptance of concrete.

29. All the materials to be used on the work shall be of best quality available and shall have the approval of Engineer-in-Charge before use.

30. The contractor shall arrange to provide portable lights and markings with the luminous paint to indicate the areas under construction/or repairs as per the direction of Engineer-in-Charge. These lights shall be of the approved colour and capacity and shall be operated throughout the night and during bad

weather. In addition to these markings, lights cone markers painted with luminous paints shall also be put.

31. The contractor will remove the labour huts on completion of the work. The payment of final bill will be subject to the compliance of this condition by the contractor.

32. The contractor shall provide suitable temporary diversion arrangement for flow of water in the existing drain pumping and bailing out water from the drain, if required for proper execution of the works at his own cost, as per directions of Engineer-in-Charge.

33. In all contracts relating to security, watch and ward services, the contractor shall engage ex-servicemen or ex-police personnel to the contracted job.

34. The contractor shall make necessary arrangement for all machinery, equipment etc. considered necessary by the Engineer-in-Charge for completion of works within the stipulated time. The rates quoted by the contractor shall include the cost of providing/ running all such machinery, equipment etc. Nothing extra shall be paid on this account.

35. The contractor shall regulate the movement of vehicles in accordance with the regulations of local traffic authority and shall provide necessary roads, diversions etc. for access of vehicles to the site of work. Nothing extra over and above quoted by him shall be paid on this account.

36. SCOPE OF THE WORKS

Works to be carried out as per the Bill of Quantities /Structural details and design as approved by AAI and any other related works considered necessary.

A. INTENT OF THE PLANS AND SPECIFICATION:

The drawings, together with the contract specification, are intended to show and explain the manner of executing the work and to indicate the type and class of materials to be used. The work to be carried out under the contract shall, except as otherwise provided in these conditions, include all labour, material, tools, plant, equipment and transport that may be required in preparation of and for and in the full and entire execution and completion of the works and maintenance of the same during the construction and observation period. The description given in the schedule of works shall, unless otherwise stated, be held to include waste material, carriage and cartage, carrying or hoisting setting and fixing in position and all other labour necessary and for the full and entire execution with good practice and recognized principle and any urgent and temporary works, fully contingent on the work.

B. Excavation:

While carrying out the excavation work over the areas or in the foundation trenches, the contractor shall carry out the excavation work very carefully assuming that there may be certain power Communication cables and

other services like storm water drain, water supply line, chill water pipe line and firefighting line and manholes etc. In case of any damage to the services while carrying out the work, the contractor has to make good the same at his own expenses.

Before any excavation work is started with the help of heavy machinery, the contractor shall cut/ open the trench of size approximately 1.00 m Wide x 1.00 m deep as per direction of Engineer-in-Charge to find out the underground services, if any, then excavate further along the alignment of such services and then only switch over to the excavation with the help of heavy machinery. Nothing extra shall be paid for the same.

C. DRAWINGS AND DOCUMENTS

- The drawings/ cross sections of pavement accompanying the tender document are of indicative nature and issued for tendering purpose with the purpose to enable the tenderer to make an offer in line with the requirements of the AAI.
- The execution of work shall be as per the "Approved drawings/ pavement sections" and detailed specifications provided by Engineer-in-charge. No claim whatsoever, shall be entertained for variation in the approved for construction drawings and tender drawings.
- Drainage design and layout to ensure efficient water runoff and prevent water logging in entire operational area of **Valmiki Nagar Airport** will be submitted by the agency to E-I-C based on structural design study & layout duly vetted from Govt. Engineering College / NITs / IITs. This drainage design and layout will be got approved by E-I-C before execution.

D. BILL OF QUANTITIES

The Bill of Quantities shall be read in conjunction with General Conditions of Contract, Special Conditions of Contract, Technical Specifications, Drawings, AAI, MoRTH and CPWD specifications and any other Document forming a part of this tender. The quantities shown against the various items are only approximate and subject to variations as made in General Conditions of the Contract.

37. TEMPORARY SERVICE ROADS/GATE, PREPARATION OF GROUND ETC.

a. The contractor shall bear all expenses and charges, on special or temporary service roads/Gate required by him in connection with access to the site. He shall not object to the use of service roads/Gate by other construction traffic.
b. Upon completion of the work such roads/Gate shall be broken up and leveled/repair of Wall where so required by the drawings unless the Engineer-in-Charge shall otherwise direct.
c. Conveyance of men and materials and inspection staff etc. to any portion of the work site involved in the construction shall be the responsibility of the contractor.

d. The contractor shall segregate the site of work from other area by providing barricade as per design and drawing approved by the Engineer-in-Charge. Final design and location plan will be approved by the Engineer-in-Charge at the time of execution of work. **Noting Extra will be paid to the Contractor on this account.**

e. All temporary works required for execution of the main work shall be the responsibility of the Contractor and the quoted rate for the work is assumed to be inclusive of all such works and noting extra is payable on this account.

38. CO-OPERATION BY CONTRACTOR:

The contractor shall give his constant attention to facilitate the progress of the work, thereof and shall co-operate with AAI officials and others in every way possible. He shall have to be present on the work at all times. During his absence, a competent representative who is able to communicate with the department's representative and is authorized to receive order and act for him, should be present.

39. INSTRUCTIONS AND NOTICES:

a. Subject as otherwise provided in this contract all notices to be given on behalf of the department and all other actions to be taken on its behalf. may be given or taken by the Engineer-in-Charge or any officer, for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.

b. All instructions, notices and communication, etc. under the contract shall be given in writing and if sent by registered post to the last known place of above or the business of the contractor, shall be deemed to have been served on the date on which in the ordinary course of post, these would have been delivered to him.

c. Contractor or his agents shall be in attendance at the site(s) during all working hours and shall superintend the execution of the works with such additional assistance in each trade as the Engineer-in-Charge may consider necessary and orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

d. The Engineer-in-Charge shall communicate or confirm his instructions to the contractor in respect of the execution of work in a works site order Book maintained at the site office of the Engineer-in-Charge and the contractor or his authorized representative shall confirm receipt of such instructions by signing the relevant entries in this book. Contractor is also authorized to write his remarks related to the work in the site order book. On demand by the contractor, he shall be furnished certified true copy of instruction(s).

40. WATCH AND WARD & LIGHTING:

The contractor shall provide and maintain at his own expense all lights, fencing and watch & ward when and where necessary or required by the Engineer-in-Charge for the protection of the work or for safety and convenience of those employed on the work or the public.

41. DEPARTMENTAL REPRESENTATION:

The Engineer-in-Charge during his absence on the works shall be represented by one of his authorized subordinates, whose duties in relation to the contractor shall be to ensure that work is performed in conformity with the plans and specifications in all respects. He shall communicate to the contractor the instructions and directions of the Engineer-in-Charge on all questions relating to the work, and the contractor shall comply with such instructions and directions. He shall request the contractor in writing to suspend the performance of any part of the work, if in his judgment the contractor is deviating from the plans and specifications, in spite of his instructions and contractor shall comply.

42. SITE CONDITIONS, REQUIREMENTS & SOURCES OF MATERIALS BENCH MARKS AND SETTING OUT OF WORKS

a. The levels of the various floors of building and pavements, road work etc. shall be as shown in the architectural level plans, should there be any discrepancy in the floor/ ground levels, the decision of the Engineer-in-Charge shall be final and binding and no claim whatsoever shall he entertained on this account.

b. The contractor shall be responsible for the true and proper setting out of the work and for the correctness of the position's levels and dimensions and alignments of all parts of the works and for the provisions of all necessary applications and labour in connections therewith.

c. If any time during the progress of the work any error may appear or arise in the position, levels, dimensions or alignments of any part of the work, the contractor on being required to do so at his own expense, rectify such errors to the satisfaction of the Engineer- in-Charge.

d. The checking or any setting out of any line or level by the Engineer-in-Charge or his representative shall not relieve in any way the contractor of his responsibility for the correctness thereof and he shall carefully protect and preserve all Bench marks, site rails, pegs and other things used in the setting out of works.

e. Completion of all items of the work in question-shall be carried out by the contractor at his own cost.

f. The contractor shall also keep proper record of such permanent Benchmarks established denoting therein their correct levels.

g. The work of establishing all such bench marks shall be carried out only by experienced staff of the contractor with the help of precision instruments suitable for this type of work. The instruments used shall be checked for their accuracy and for permanent adjustment before the commencement of the work and also at frequent intervals during the progress of the work.

h. All such Bench marks established by the contractor shall be subject to check and approval of the Engineer-in-Charge or his representative and any variations noticed in the work as a result of improper establishment or maintenance of such Bench marks shall be at the contractor's risk and expense.

The contractor has to adjust his work and progress the work in co-ordination with other agencies working at site.

i. The materials such as Good Earth, Moorum, Coarse and Fine aggregates etc. shall be brought to site only after approval of the quarry / source by the Engineer-in-Charge.

43. SAMPLING AND TESTING

a. The contractor at his own cost shall set up a fully furnished and adequately equipped field laboratory at site as per agreed time and progress chart between contractor & EIC and maintain the same by providing adequate technical and upkeep staff. The laboratory should have office space for engineers to do testing and store for storage of samples.

   The Engineer in charge may at his discretion, cross check the test result obtained in contractors laboratory by independent tests at an approved laboratory. The cost of such material, transport, cost of testing etc. shall be borne by the contractor.

b. The contractor shall provide proper facilities at all times for the inspection and testing of materials and the Engineer-in-Charge shall have access at all times to the place of stores or manufacture. The contractor shall give sufficient advance notice of placing order so as to permit test to be completed before the material is incorporated in the work and shall afford such facilities as the Engineer-in-Charge may require for collection and forwarding samples and making inspection. The contractor shall not make use of or incorporate in the work the materials represented by the samples, until tests have been made and materials found to be in accordance with the specifications.

   All tests of materials furnished by the contractor shall be made in accordance with commonly recognized methods of Indian or of other international organization or such other method and test as are prescribed in the specification or are in use in conformity with standard practice of the department and charges therefore, will be borne by the contractor.

c. Field tests of materials will be carried out by the Engineer-in-Charge as deemed necessary and these tests shall be made in accordance with the standard practices of the department. The cost involved in all such field tests will be borne by the contractor.

d. The various tests as indicated in the specifications or as considered necessary by the Engineer-in-Charge shall be carried out in the laboratory as approved by the Engineer-in-Charge. The contractor shall bear the entire cost of samples, testing charge, carriage and other incidental expenditure incurred thereof. The result shall be final and binding on the contractor.

e. The contractor shall submit certified true copies of the vouchers for verification of actual purchase of any materials whenever directed by the Engineer-in-Charge.

f. The contractor shall not be entitled for any extra payment whatsoever on account of the above special conditions of contract until and unless specified otherwise.

g. Contractor shall distinctly display a board at work site on the cement store indicating the opening balance on a particular day, receipt during the day and issue during the day and closing balance at the end of the day. (The entries shall be updated immediately on physical issues)

44. CONDITIONS FOR STORAGE OF MATERIAL

The contractor shall bear all incidental charges for cartage/ storage and safe custody of material. The contractor shall construct cement godown suitably at the place allotted by the Dept. and as per directions of Engineer-in-Charge for storing the materials safe against damage by sun, rain, dampness, fire, theft etc. He shall also employee necessary watch & ward establishment for the purpose. Cement of different brands and grades in gunny or polythene bags shall be stored in separate godowns each godown shall be provided with a single door with two locks. The keys of one lock should remain with Manager (Engg.)/ Asstt. Mgr. (Engg.)/ Jr. Exec. (Engg.) of AAI and that of the other lock with the authorized agent of the contractor at the site of work so that the cement is issued from the godown according to the daily requirement with the knowledge of both the parties. The day-to-day receipt and account of cement shall be maintained by Manager (Engg.)/ Asstt. Mgr. (Engg.)/ Jr. Exec. (Engg.) of AAI and signed daily jointly with the contractor or his authorized representative. Cement shall be stored and stacked in bags in dry and water proof store. The bag shall be stacked in rows of two and at least 10 to 20 cm clear above the floor with two layers of dry bricks laid on the well consolidated earth. A space of 60cm should be kept all-round as well as between the exterior walls and the stacks. Cement bags should be placed together in the stack to reduce circulation of air as much as possible. Cement bags shall not be stacked more than 10 bags high to avoid lumping under pressure. Contractor shall distinctly display a board at work site on the cement store indicating the opening balance on a particular day, receipt during the day and issue during the day and closing balance at the end of the day. (The entries shall be updated immediately on physical receipt and physical issues.)

45. INCOME TAX, LABOUR CESS AND OTHER TAXES AS APPLICABLE

Income Tax deductions shall be made from all payments made to the contractor as per the rules and regulations in force in accordance with the Income Tax Act prevailing from time to time.

Labour welfare cess shall be levied @ 1% (or as notified) on the gross amount of each running bill and final bill.

Royalty or any other tax on materials, equipments, T & P and labours in respect of this contract shall be payable by the contractor and Airports Authority of India will not entertain any claim whatsoever in this respect.

The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of AAI or the Engineer-in-Charge and further shall furnish such other information /document as the Engineer-in- Charge may require from time to time.

The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to the condition, together with all necessary information/documents relating thereto.

46. DIFFERENCE BETWEEN FIRST LOWEST BIDDER AND SECOND LOWEST BIDDER

The total amount of final bill worked out at the accepted tender rates, if found to be more than the amount worked out at the quoted rates of second lowest, the contractor shall be paid lower of the two.

47. FIELD LABORATORY AND LIST OF PLANTS & EQUIPMENTS

The contractor at his own cost shall set up within 21 days from the schedule date of start of work a fully furnished and adequately equipped field laboratory as per work requirement and maintain the same by providing adequate technical and upkeep staff. The laboratory should have office space for engineers to do testing and store for storage of samples. The remaining space shall be provided for the installation of equipment, laboratory tables and cupboards, working space for carrying out tests, besides a wash basin/sink.

The contractor shall arrange necessary laboratory apparatus/equipment as required for various routine tests to be conducted as per specification for the items of work. Contractor shall arrange necessary steel tapes, leveling instrument and total station as per requirement at the site of work. Nothing extra shall be payable to contractor on this account.

The Engineer-in-Charge may at his discretion, check the test results obtained at contractor's laboratory by independent tests at an approved laboratory. The cost of such material, transport, cost of testing etc. shall be borne by the contractor.

The Engineer-in-charge and the contractor shall agree upon a time and progress chart as per Clause 15 of Special Conditions of Contract. In time and progress chart deployment of machineries, equipment, apparatus and instructions as listed below are to be treated as one of the sections of the work. In case of the delay in deployment/non-deployment of plant, machineries and equipment, penalty at the rates mentioned below shall be levied.

The deployment of the Plants/equipment/ Machinery shall be as per the approved work program/ schedule and decision of Engineer -in-Charge with regard to recovery for non-deployment based on the work program shall be final and binding. However, these recoveries as stipulated above shall not relieve the contractor to pay levy of compensation for delay as per clause no.02 of GCC, in case the project is not completed within the stipulated time.

S. No.	Name of Equipment/machinery	Quantity (Nos.)	Rate of Recovery per day of each T&P and machinery (in Rs.)
1.	Hydraulic Excavator 0.9 cum bucket capacity	2	14,800/-
2.	Tipper for Transportation (10 cum capacity)	12	9,600/-
3.	Wet Mix Plant 100 tonne capacity	1	28,000/-
4.	Electric generator 62.5 KVA	1	1,200/-
5.	Front end loader 1 cum bucket capacity	2	8,000/-
6.	Motor Grader 3.35 metre blade	2	14,800/-
7.	Vibratory roller 8 to 10 tonne capacity	2	8,400/-
8.	Paver finisher with electronic sensor with 118 HP Motor	1	32,000/-
9.	Mechanical Broom (2.1m sweeping width)	1	9,600/-
10.	Air Compressor 250cfm	1	3,200/-
11.	Bitumen pressure distributor	1	6,400/-
12.	Batch type Hot Mix Plant HMP 120 TPH	1	1,02,400/-
13.	Paver finisher hydrostatic with sensor control compatible with the hot mix plant. Paver (174HP)	1	38,400/-
14.	Electric Generator 250 KV	1	4,000/-
15.	Smooth steel wheeled tandem roller for static and vibratory passages.	2	12,800/-
16.	Pneumatic tyre roller	2	9,600/-
17.	Water Tanker / Bowser	2	2,000/-
18.	Vibrator (Needle type)	2	400/-
20.	Tractor with trolley	2	5,000/-
22.	Mechanized runway marking and painting equipment.	1	6,000/-
23.	Trolley mounted flood light with portable power source.	4	5,000/-
24.	Field Laboratory Equipments and Instruments as per requirement, Technical Specification and direction of EIC.	As required	300/- (per equipment)
25.	Total station	1	1000/-
26.	Auto Level	2	1000/-

48. Restriction of working Hours (if applicable): -

The work shall be carried out inside the Airport operational area also. The number of hours working in the area might be restricted due to operational reasons and the contractor shall not have any claim for extra payment on this account. For entry inside operational area, the contractor shall obtain necessary Airport Entry Pass (AEP), Airfield Driving Permit (ADP) for the

workmen and machinery i/c vehicles from the regulatory authority. Any fees for AEP & ADP etc. shall be borne by the contractor. In this regard the contractor and the workmen employed by the contractor for the work shall strictly adhere to the instructions issued by the IAF/BCAS (Bureau of Civil Aviation Security) and the Airport Security Wing. They have to obtain necessary security clearance from BCAS/IAF if required.

49. Guidelines for admission to site & comply to mandatory security guidelines issued by BCAS (if applicable):

The following directions issued by BCAS shall strictly adhered to by successful bidder.

1. The Temporary Aerodrome Entry Permit (TAEP) initially for a period of 30 days will be issued by Airport Director, Airports Authority of India (AAI)/respective Airport Operators, with whom the entity entered into written agreement, following the due procedures, to commence business inside the Airport.
2. Immediately thereafter, formalities to comply with the instructions of BCAS i.e. obtaining Provisional Security Clearance / Security Clearance through E-sahaj Portal and submission of Security Programme, are to be strictly adhered to. Necessary assistance/ guidelines, if required may be obtained from the Airport Operator/ BCAS in this regard. The above are mandatory requirements for continuing business in the Airport premises.
3. The entities who have already obtained Security Clearance for their operations in other region(s), should intimate concerned RO, BCAS accordingly duly enclosing
   (i) Intimation Letter regarding establishing their business in concerned Airport,
   (ii) Security Clearance issued by BCAS, HQ,
   (iii) Provisional Security Clearance(s) issued by the RO, BCAS, of other Region(s),
   (iv) Written Contract Agreement by the concerned Airport Director
   (v) Authorized Signatory for concerned Airport and
   (vi) Security Programme for concerned Airport.
4. Failure to comply with any of the above instructions will entail suspension or withdrawal of TAEP/AEP issued.
5. The above points are not exhaustive and the updation/ addition/ omission if any will be appraised from time to time".

50. Videography of Construction Site:

1) Shoot a high resolution, HD Quality video film of 2 to 3 minutes duration every fortnightly of all major construction activities, to be arranged by contractor in coordination with EIC or his authorized representative.

2) Videography of work be also carried out suitably by the concerned Engineer-In-Charge. The photographs and Video film be shared with General Manager (Corporate Communication) and General Manager (PM & QA) every fortnightly.

51. NOTAM (if applicable):

The work shall be executed day and night as per the availability of NOTAM and nothing extra will be paid on this account. The agency has to mobilize, execute and demobilize the resources within this time schedule and no extension of time beyond NOTAM hours will be permitted in any circumstances. The work shall be taken up in a phased manner and as per NOTAM schedule for any particular stretch/portion of work site, so that day to day operations of flights schedule are not affected. Also, all laid down norms / precautions for executing works at an operational Airport must be complied with which includes necessary arrangements for temporary closure of runway, Provision of temporary ramps, markings after each day's work etc.

The work involves construction of pavements in operational runway and taxiways. The contractor is responsible for taking necessary precautions for working in the proximities of runway & taxiways at his own expense as per the requirement & direction of Engineer-in-charge. Nothing extra shall be payable on this account.

The working hours shall be given in accordance with the NOTAM and operational needs with minimum of 6 to 8 hours per day. Further, working hours for the sites away from active runway / operational area may be available for 24 hours per day. However, the working hours will be decided before execution of work in consultation with all the stakeholders and will be made available to successful bidder well in advance.

52. Safety Standard of construction equipment/vehicles:

The construction equipment/ vehicles deployed inside operational area shall be accompanied by an initial certificate of pavement/road worthiness and fitness issued by the manufacturer/relevant authority. Subsequently, after expiry of the initial certificate, manufacturer or his authorized agency shall issue fitness certificate including servicing and calibrations on yearly

basis for the safe operation of the construction equipment in operational area.

53. Measurement for Pavement Items:

The measurement of the items related to pavement works (Excavation, Embankment, Moorum, GSBC, WMM, DRLC, PQC, DBM, SDAC & DAC etc.) shall be made as per the initial levels and final levels after execution of each item.

54. Mix Design /Job Mix:

1. The mix Design/Job Mix shall be got designed by the Contractor in the material testing laboratory (approved by AAI/Govt. institutions i.e., IITs, NITs, Govt. Engg. Colleges) as directed by the Engineer-In- Charge so as to obtain the target strength.
2. The Engineer-in-Charge of work shall ensure that the mix design report received from approved Laboratory / Engg. College as per NIT conditions, is got approved from concerned General Manager (Engg.) of Project/Work prior to adopting at site.
3. This mix design shall be provisional and subject to obtaining satisfactory results with trial mixes. Final approval shall be issued only after getting the satisfactory test report from trial mixes.
4. Any change in the source of materials or mix proportions including change of brand of cement proposed by the Contractor during the course of work shall be assessed by making laboratory trial mixes and same shall be incorporated in work with written approval of concerned Engineer-In-Charge.
5. Laboratory charges for mix design, cost of materials, its cartage and other incidental expenses shall be borne by the Contractor.
6. All samples for tests shall be taken in the presence of the Engineer-in-charge and the contractor or their authorized representatives.

55. MATERIAL AT SITE

a) Materials brought to the site by the contractor shall be stored by the contractor in a safe/dry storage space. The contractor shall be responsible for safe custody of materials at site till such time, the installation is commissioned and handed over to the Engineer-in-Charge.
b) Cement bags shall be stored in separate godowns to be constructed by Contractor at his own cost with weather proof roofs and walls. Bulk cement should be stored in silos.

SPECIAL CONDITIONS OF CONTRACT- ELECTRICAL

1. SCOPE

i) Special conditions of contract shall be read in conjunction with General Conditions of Contract, Technical specifications, Drawings and any other documents forming part of this contract wherever the context so requires.

ii) Notwithstanding the sub-division of the documents into these separate sections and volume every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the CONTRACT so far as it may practicable to do so.

iii) If there is any difference/ discrepancy or contradiction in the provision of the specification of item of work and the description of the item given in the schedule of Quantities, the scope of the items shall be taken according to the following order of precedence: -

a) Nomenclature of the items as given in the schedule of quantities (SOQ).

b) Technical specifications.

c) Special conditions of contract.

d) General conditions of contract.

e) Drawing / Sketch enclosed, if any

f) DGCA CAR requirements.

g) ICAO/FAA recommendations.

h) CPWD specifications with up to date amendment.

i) Indian Standard Specification/ Code of Practice.

j) International Specifications/ Code of Practice.

k) Sound Engineering Practices.

l) Direction of Engineer-in-Charge whose decision shall be final and binding on the contractor.

iv) Any reference made to any of standards/ specifications shall imply the latest version of that standard, including revisions/ amendments issued up to last date or extended date of receipt of Tender. The contractor shall keep, at his own cost, all such publications of relevant Standards applicable to the work at site.

2. BRIEF OF WORK

The scope of work including SITC and other allied work which is mention below:-

i. SITC of PAPI Light

ii. SITC of Constant Current Regulators

iii. SITC of CI Transformer Housing boxes

iv. Remote control panel.

v. SITC of UPS System

vi. Supply & laying primary AFL cables

vii. Supply & Laying Secondary Lead

viii. SITC of WDI, SNI, WGS, Guidance signages

ix. SITC of Apron High Mast with lighting

x. SITC of Perimeter lights with poles

xi. SITC of LT Panel, Feeder Pillars

xii. Supply & Laying of LT Cables

xiii. Supply & Laying of DWC HDPE Pipes

xiv. Supply & making end terminations

xv. Provision of Earthings

xvi. Provision of Route Markers

xvii. Numbering of poles

3. RATES

Prices shall be quoted in INR and shall be inclusive of any taxes, duties, cess, fee and charges etc. levied under any statute but exclusive of Goods & Service Tax (GST). The other duty levied by Custom Authorities in respect of import of any materials or any other tax on material, labour, services or contract in respect of this work contract including payment to local/ Govt./ Statutory authorities shall be payable by the contractor and Airports Authority of India will not entertain any claim whatsoever in this respect. Statutory deductions i.e. Income tax, TDS GST, Cess etc will be deducted at the time of making payment of running account bill applicable as per government law during payment made to the Contractor. Nothing extra will be paid by AAI in this respect.

a) Price shall be firm throughout the contract period or any extended period of completion.

b) The tenderer is responsible for ascertaining all relevant information and making due allowance in his tender for any factors likely to affect his contract works. The contractor shall be deemed to have examined the tender documents, detailed specification, data etc. and to have visited the site or ascertained all relevant details for offering suitable equipment /installation.

c) The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the schedule of quantities or in bills of Quantities which rates and prices shall, except and otherwise provided, cover all his obligations under the contract and all matters and things necessary for the proper completion and commissioning of the works.

4. WORKING DRAWINGS & COMPLETION PLAN

i) Within 60 days of award of work, the successful tenderer shall furnish drawings as required for approval to the Engineer-in-Charge. Such drawings shall be based on BOQ items, tender specifications, relevant IS/ BIS / BS/ CPWD, ICAO Annex14 /CAR, design manual part 4 & 5, FAA, local laws and regulations for the scope of work as amended up to date.

ii) On completion of works, the contractor shall submit four sets of "As – Built" drawings, one set reproducible and one set in CAD version in CD to AAI before the submission of the final bill. The details of the 'As-Built' drawings along with the documents / tool etc. for each subhead as required by AAI to be submitted are as given below, failing which Rs. 50,000.00 recoveries shall be made for each system of following works executed. General Arrangements, Layout drawings with dimensions, plans, sections etc.

- Control & Schematic Diagrams.
- Data Sheets /Equipment name plate details
- Control logic (where applicable)
- Details of Inventory
- Test Certificates (Factory Tests, sites Test)
- Guarantee/ warranty Certificates (where applicable)
- Other documents/ drawings as per the instructions of Engineer-in- Charge.
- Keys, operating handles, tools etc. as applicable
- As-built drawing for all services and approval of As-built drawings from AAI/local authority, where ever required.
- Manuals for System Operator, System Administrator and System Engineer.
- Detailed system specifications.

- Block diagram of the system with brief descriptions.
- Schematic circuit diagram as also unit/ module-wise diagram and stage-by-stage detailed description.
- Data flow-chart with data at different points during operations & testing.
- Component layout & position chart/ photograph for ease of locating the components.
- List of components/ units/ PCBs, module-wise with value, tolerance, Part No, type and circuit reference (where applicable).
- Servicing/Maintenance instructions including preventive Maintenance schedule. Indicate type of test equipment to be used for maintenance.
- Troubleshooting chart with proper test sequence, Voltage and data at various test points.
- Any other relevant information.

5. SCHEDULE OF QUANTITIES (SOQ)

i) Contractor shall examine the requirements of various items **within 30 days** of award of work and shall report to Engineer-in-Charge with regard to deviations in the existing items and requirement of additional/extra items, if any, for taking necessary action. Upto date status of all items including deviations, extra items (if any) have to be submitted with technical and financial supporting documents along with working drawings.

ii) Tenderers are required to quote as per e-NIT schedule

iii) Taking into account all the specifications and conditions.

6. ADMISSION TO SITE

i) The airport belongs to AAI. The installations, testing and commissioning of items falls within the restricted/ operational area. The contractor is expected to finish the work by adequate planning with Engineer-in-Charge. All men materials and vehicles shall be permitted to enter the aerodrome operational are only on possession of the security passes issued by AAI if required.

ii) The contractor shall apply in writing to Engineer-in-charge well in advance of the commencement of work for issue of security passes along with a copy of **Security Clearance and approved Security Programme (if required)** and shall submit a list of personnel concerned with their proof of identity, photographs, **police verification (if required)** as per BCAS requirement, address, fees (if applicable) and other related formalities as per AAI/BCAS security guidelines. Engineer-in-charge at his discretion, have to recommend the issue of passes to control the admission of contractor, his staff and workmen.

iii) The contractor and his employees shall abide by security regulation framed by AAI/ BCAS or Police Authorities. Any worker of the contractor, whose presence is found undesirable in AAI premises, shall not be allowed to work. The Contractor shall be fully responsible for the satisfactorily working of his staff.

"**If Contractor or his authorized representative or his employed workers are found violating any of security regulations, suitable action shall be taken by AAI as per prevailing rules**"

The work will lie in operational /Restricted Area of airports. The contractor shall apply in writing, in advance before commencement of work, if required for issue of security passes along with security clearance and police verification as per BCAS guidelines and shall submit a list of personnel concerned with their addresses and shall satisfy the Engineer-in-Charge who shall at his discretion have the right to recommend the issue of passes to control the movement of the contractor, his agents, his staff and workmen. The cost of photograph and prescribed fee (INR), if required, for the issue of the passes will be borne by the contractor. All men and vehicles shall be permitted to enter the restricted/ office area only on possession of the security passes. The contractor shall ensure that his men work only in areas/zones allotted to them. The contractor or his staff/ workmen shall observe all the rules promulgated from time to time by the concerned authorities. Any person found violating the security rules laid down by the Airports Authority of India will be expelled from the area without assigning any reason whatsoever and contractor shall have no claim on this account. Passes shall be deposited back with Engineer-in-Charge on demand and in any case immediately after completion of work.

No time extension shall be granted and nothing extra shall be payable by AAI on account of restricted due to non-operational hours and in restricted working conditions**.**

7. SITE PRECAUTIONS

i) The contractor shall provide red flag barricades, caution boards at site, if required, designated by the Engineer-in- charge. One supervisor has to present at site all the time during work execution with walky-talky for co-ordination.

ii) The contractor shall take all precautions to avoid all accidents by exhibiting necessary day & night caution boards, speed limit boards, red flags, red lights and providing barriers reflective jackets to staff. He shall be responsible for all damages and accidents caused due to negligence on his part.

iii) The contractor shall remove all the dismantle materials etc. on each day completion of the work and leave the site in a neat and tidy state. The payment of final bill will be subject to the compliance of this condition by the contractor.

8. CO-ORDINATION

i) There are various agencies working in airport area. The tenderer is responsible for ascertaining all relevant coordination/ information with other agencies including AAI for smooth and safe progress of work. The cost of all measures necessary to ensure complete co-operation/co-ordination between contractors/works/airport agencies shall be deemed to be included in the quote.

ii) The contractor shall be responsible for any damage, resulting from his operations either to buildings, structures, airport fixtures, underground cable, hard surface areas, water/telephone lines, other operational installations, Airport roads etc. The contractor shall restore, replace or repair any such damage to the complete satisfaction of the Engineer-in- charge and in default, the Engineer-in- charge may cause the same to be made good by any other means and deduct the expenses from any sums due to contractor.

9. TECHNICAL SUBMITTALS

i) The contractor shall submit equipment proposals with brochures, specifications, descriptions etc., for the reviews and provisional approval by the Engineer-in- charge, prior to ordering of equipment and commencing the manufacturing of equipment.

ii) In addition, the submittals shall include a complete list of specifications conformity (Manufacturer's Certification of Guarantee and Necessary Compliance) and, if applicable, deviation with the specifications shall be listed.

10. MANPOWER AND SITE ORGANISATION

i) The contractor shall provide adequate qualified and skilled personnel on the work. No engineering personnel deployed at site shall remove from the site without prior approval of the Engineer-in- charge. Contractor has to depute minimum 1 no. electrical Graduate/Diploma in Engineering at site during the entire period for SITC work till final measurement.

ii) Authorized, experienced and competent work force shall be deployed.

11. LABOUR

i) The contractor has to discharge all the obligations as provided under various statutory enactment including the EPF/ESI/ Contract Labor (Regulation and abolition)/ Minimum Wages / Payment of Wages/Payment of Bonus, Payment of Gratuity / Workmen's compensation / Works Contract and other relevant Acts, Rules and Regulations in force and as amended from time to time in the State, as applicable.

ii) The contractor has to follow the local security/ safety rules & regulations and such instructions on restricted hours of work as may be imposed on him by the department /local authorities, while working in security restricted zones and no claim whatsoever on account of this, will be entertained.

12. FACTORY INSPECTION (As per category indicated in the list of preferred makes)

i) Authorized representatives of AAI shall carry out factory acceptance test (FAT) of materials before these are dispatched from the works/factory. After approval of the item by Engineer-in- charge, sufficient advance intimation (15 days) shall be provided by the firm to enable AAI representatives to carry out inspection at specified date. Travelling, boarding and lodging expenses for factory inspection of AAI inspectors shall be borne by AAI. However, in the event of re-testing/non-acceptance of the material/equipment or any portion of equipment the cost of re-inspection including the travelling, boarding and lodging expenses of AAI inspector shall be borne by the contractor. FAT shall be carried out as per List of preferred makes as attached in the tender document.

ii) AAI shall have full power to inspect any part of the work, the materials and workmanship at the contractor's work or at any other place from which the material or equipment is obtained. Under specific conditions/reasons, AAI may waive off factory inspection. Acceptance of any material or equipment shall in no way relieve the contractor of his responsibility for meeting the requirements of the specifications.

iii) Routine type tests for the various items of equipment as specified in technical specifications shall be performed at the contractor's/manufacturer's work and test certificate furnished. The contractor shall permit the Authority's authorized representative to be present during any of, or all tests. After notification, the contractor shall make under the direction and in the presence of the Engineer-in-charge, such tests and inspection as have been specified or as the Engineer-in-charge shall consider necessary to determine whether or not, the full intent of requirements of the plans and specifications have been fulfilled. All tools, instrument, plants, manuals, IS/IEC and labour/ operating personnel require for the test shall be provided by the contractor at his own cost.

iv) The Engineer-in-Charge may at his discretion, check the OEM's test result by independent Govt./ Govt. Accredited laboratory. The cost of independent lab testing, transportation packing etc. shall be borne by the contractor.

v) EIC also is empowered to demand for a video witnessing /inspection in case of waiving off factory inspection. If any test could be carried out at site, the same shall also be arranged by the contractor to the satisfaction of AAI.

13. THE LIST OF PREFERRED MAKES

Unless otherwise approved by AAI, the materials to be supplied or incorporated in various works relevant to the instant contract, shall remain confined to any of the preferred "Makes" only, subject to their meeting the technical requirements as spelt out under the schedule of work enclosed and specifications given in the tender. The List of preferred makes are given in tender. Any other makes meeting functional and technical requirement of the tender may be approved by TS authority subjected to non-availability of preferred makes and also the newly proposed make falls within the price band of 10%.

Due care has been taken to ensure that technical specifications for various equipments/systems are generic in nature. However, in case any restrictive specifications are noticed, bidders are encouraged to bring out the same in pre-bid queries, before submission of their bids for appropriate clarification from AAI.

Prior approval of Engineer-In-Charge is essentially required for supplying of material.

14. POWER SUPPLY

AAI will not be responsible for the supply of water and Electric power to the Contractor for execution of work. The Contractor shall make his own arrangements for temporary connections required, if any, and make necessary payments to the Departments concerned. No amount shall be payable by AAI on this account.

15. STORES AND MATERIALS

i. The contractor can be provided storage space at some place in airport depending upon the availability as per discretion of Engineer-in-Charge. AAI may also give open space for store on chargeable basis as per AAI prevailing rate. The contractor shall stock the material at site of the work as per the instructions of Engineer-in-Charge keeping in view of the passenger/ operational requirements of AAI.

ii. Construction, watch & ward of the stores, equipment & materials shall be the responsibility of the contractor. Materials brought to the site by the contractor shall be stored by the contractor in a safe/ dry storage space. The contractor shall be responsible for safe custody of materials till the installation is commissioned and handed over to the Engineer-in-Charge.

iii. All materials required for satisfactory completion of the work shall be arranged by contractor from his own sources. No claim whatsoever shall be entertained by the Authority on account of delay in either providing or non-availability of these materials in the market.

iv. All the materials required for this work should conform to relevant specifications. The copies of Purchase Vouchers should be produced along with the materials. The test certificates, routine test certificates and acceptance test certificates are also to be submitted as required.

v. The contractor shall take away the balance of any materials left at the site after commissioning of the system and as per directions of Engineer-in-charge. The cost, if already paid for such items shall be deducted from the subsequent running bills. AAI shall not be liable to pay for any of the incidental charges connected with the above.

16. PREPARATION OF SITE FOR EXECUTING THE WORK:

It shall be the responsibility of the contractor to clear the site of any materials/ vegetation/ tree branches etc. to prepare the site ready for work. Nothing extra shall be payable by AAI on this account.

17. CONSUMPTION OF MATERIALS

Proper record of daily consumption of materials shall be maintained at the site of work for each item as directed by AAI. This is also required even if the contractor arranges these materials himself.

18. PLANTS AND TOOLS

The tenderer shall work out the requirement of plants & tools required for execution and timely completion of works as per schedule and shall deploy the required nos. of plant & tools and manpower accordingly. The details of such plant & tools shall be submitted. Tenderer shall closely monitor the progress and if required additional tools, plants and labor (both skilled & unskilled) shall be deployed to complete the work in time.

19. BYE-LAWS

i) The contractor shall comply with all bye-laws and regulations of local and statutory authorities having jurisdiction over the works and shall be responsible for payment of all fees and other charges and for giving and receiving of all necessary notices and keeping the Engineer-In-Charge informed of the said compliance with the bye-laws, payments made notices issued and received.

ii) The contractor shall indemnify the AAI against all claims in respect of patent rights, design, trademarks of name or other protected rights in respect of any plant, machine, work or materials used for or in connection with the work or temporary works and from and against all claims, demands, proceedings cost, charges and expenses whatsoever in respect of or in relation thereto. The contractor shall defend all actions arising from such claims and shall himself pay all royalties license fees, damages costs and charges of all and every sort that may be legally incurred in respect thereto.

20. ARRANGEMENT TO BE PROVIDED BY AAI

Unless otherwise specified or agreed upon, Airports Authority of India will provide only the following services: -

- Necessary power for testing and commissioning of the system free of cost.

- Open space for storage of equipment's.
- Any other services/support essentially required for execution of works as per E-I-C approval.

21. PERFORMANCE

i) The contractor shall perform all works in substantial and acceptable manner in accordance with the plans and specifications and in accordance with such further and explanatory drawings, details and instructions as may from time to time be given by the Engineer-In-Charge. The work must be progressed within such sections and at each time as directed by the Engineer-In-Charge.

ii) The contractor shall provide and do everything necessary for the proper execution of the works according to the true intent and meaning of the drawing and specifications taken together, whether the same may or may not be particularly shown on that drawings or described in the schedule of quantities, provided that the same can be reasonably inferred there from. Figured dimensions to be followed in preference to scale dimensions and all dimension and particulars to be taken from the actual work.

iii) It must be clearly understood that the whole of the conditions is intended to be strictly enforced and that no extra charges in respect of extra work will be allowed unless they are clearly outside the spirit and meaning of the conditions or unless such works shall have been ordered in writing by the Engineer-in- Charge.

22. NUISANCE

The Contractor shall not at any time do, cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance or inconvenience to owners, tenants or occupiers of other properties near the site and to the public generally.

23. DUTIES AND POWERS OF ENGINEER-IN-CHARGE'S REPRESENTATIVE

i. The duties of the representative of the Engineer-In-Charge is to watch, supervise and measure the works also to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to order any work involving any extra payment by AAI nor to make any variation in the works.

ii. Failure of the Representative of the Engineer-In-Charge to disapprove any work or materials shall not prejudice the power of the Engineer-In-Charge thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof.

iii. If the Contractor shall be dissatisfied with any decision of the Representative of the Engineer-In- Charge, he shall be entitled to refer the matter to the Engineer- in-Charge who shall thereupon confirm, reverse or vary such decision.

24. INSPECTION OF SITE

The bidder shall be deemed to have satisfied himself as to the nature of the site of work,

local facilities of access, availability of materials and all other matters affecting his prices for the execution and completion of work. He is required to make himself fully acquainted with the nature & scope of work. Nothing extra shall be paid by AAI for any misunderstanding by bidder after tender quote.

25. GUARANTEE AND DEFECTS LIABILLITY PERIOD

i. The contractor shall guarantee that all equipment and the installation shall be free from any defects due to the defective material and bad workmanship and that the equipment shall operate satisfactorily and that the performance and efficiencies of the equipment shall be not less than the guaranteed values. Any parts of the installation found defective during guarantee period shall be replaced / rectified by the contractor without any charge whatsoever. The services of the contractor's and /or manufacturer's personnel, if requisitioned, during this period, for such work, shall be made available free of any cost to the Authority.

ii. If the defects are not remedied within a reasonable time as mentioned in the written notice, the Authority shall proceed to do so at the contractor's risk and expense without prejudice to any other right.

iii. **All LED light fixtures should have a total guarantee/ warranty of 5 years including Defect liability period of 01 year for the work**. During warranty, any fault in the inset fitting including LED strips, driver, lens etc. should be replaced free of cost to AAI.

iv. Complaints, if any, with respect to any defect to material, workmanship manufacture, installation and performance of any of the equipment or any part or parts thereof shall be notified by the AAI in writing by registered post or by e-mail. The contractor shall remedy such defects within notified period from the date of notification at his own cost, charges and expenses when called upon to do so by the AAI.

v. All inspection, replacement or rectification carried out by the contractor during the testing & commissioning period shall be at the cost of the contractor.

vi. The contractor shall keep sufficient spares to replace defects during the DLP and guarantee/ warranty period

vii. The Contractor shall train all Electrical AAI Site team during the erection and also familiarize them with the operation and maintenance of all the system for a minimum period of two weeks to the full satisfaction of AAI, failing which Rs. 50,000.00 recoveries shall be made.

Training shall be provided for understanding and operation of all the items related to all systems. Charge for training should be included in the total cost. The contractor shall also provide training materials to the staff prior to the commencement of the training.

The Contractor shall conduct during the period of the Contract, a training course in the operation and maintenance of the Systems. The training program shall include

mechanical, electrical, hardware and software aspects of the Systems and of duration sufficient to cover the topics in detail. The training programme shall be submitted to AAI for his approval. The Contractor shall train and certify all AAI's (or its nominated agents) O&M personnel in the proper operation and maintenance tasks for the Systems. As part of the system operations programme, the Contractor shall also provide instruction for all AAI Electrical personnel for each training block. This training shall provide an overview of system elements and operations describing the features and cover applicable operation safety procedures.

Final Bill of the bidder for SITC work shall be released only after imparting the training by the bidder to the specialized agency engaged by AAI for Operation and Routine Maintenance.

26. RESPONSIBILITY FOR COMPLETENESS

Any fitting or accessories may not be mentioned in the specifications but which are usual or necessary are to be provided by the Contractor without extra charge, so as to make the equipment complete in all details to meet the specifications. In all cases, where the contract provides for test on site shall be provided by the contractor free of charge, such labour, materials. Fuels, equipment apparatus and instruments as may be required from time to time and as may reasonable be demanded efficiency to carry out such tests of the equipment, mate workmanship in accordance with the contract.

27. SUPERVISION

The contractor shall provide adequate supervision at all stages of the work and examine all components for accuracy before execution is commenced. He shall also provide facilities and space satisfactory to the Inspector/Purchaser for laying out for his inspection any component to be used in the work at such stages of execution.

28. TAKING OVER

When all performance tests called for by the particular specifications have been successfully carried out after completion of the work, the same shall be accepted and taken over by AAI Engineer-In- Charge shall forthwith issue a taking over Certificate.

29. SECURITY DEPOSIT:

Security Deposit for the original work (SITC work) is 10% of the completed cost and shall be released only upon successful completion of Defects Liability Period of 01 year from the actual date of completion of work. However, the guarantee / warranty for LED light fixtures shall be upto 05 years from the date of actual completion of work and Two(02) years for UPS and Batteries. The proportionate amount of this Security Deposit component for Supply of LED light fixtures shall be released only after completion of 05 years Period and for UPS and Batteries after 02 years.

The Contractor shall hold himself fully responsible for replacement of defective materials/

spares free of cost to AAI during the defect liability period and guarantee/ warranty period.

30. TERMS OF PAYMENT

i) For supply, installation, testing & commissioning items:

- 70% of item rate on prorate basis on delivery of material at site in good condition.
- 20% of item rate on installation.
- 10% of item rate on Testing & Commissioning.

ii) For installation, testing & commissioning/ Laying items :

- 80% of item rate on installation/ Laying.
- 20% of item rate on Testing & Commissioning.

iii) For supply items :

- 90% of item rate on pro rata basis on delivery of material at site in good condition.
- 10% of item rate on Testing & Commissioning.

Contractor shall submit copy of original purchase bill, test certificates and other related documents to process the bill for payment.

31. Packing, Forwarding and Shipment

Packing shall ensure full protection to the equipment against deterioration or physical damage during handling and transportation by Air, Road, Rail or Sea. Packing list, giving full details of the contents in a weather proof wrapping, shall be enclosed with each case, which shall be marked on the outside with the following details:

a) Name of Manufacture

b) Major Component name and numbers

c) Brief description of contents

Contractor shall be held responsible for all damages due to improper packing. The cost of packing, forwarding and Transportation shall be to the account of supplier.

32. REQUIREMENT FOR SPECIALIZED AGENCY

a) The contractor shall himself meet the eligibility criterion, as per pre-qualification criteria mentioned in NIT in order to carry out specialized packages. Otherwise he shall associate and engage the only one specialized firm meeting the eligibility criteria stipulated pre-qualification criteria mentioned as per "APPENDIX-EB" to execute the respective sub-head of the contract.

b) Specialized Works: Specialized works /items/ jobs are those works that requires expertise/specialized skill and are executed after prequalification of agencies. The specialized agency shall have in house capability to prepare shop drawings and technical submittals.

c) The contractor shall submit the credentials for approval of AAI and engage specialized agency only after approval of Engineer-In-Charge (E-I-C), whose decision based on the feedback & credentials of the agencies on the matter shall be final & binding. The contractor has to submit the details of specialized agency within Two month from the date of signing of agreement or 60 days from issue of work order, whichever is earlier.

d) Penalty of Rs 50,000/- per week/per specialized agency will be imposed in case main contractor fails to submit the credential of specialized agency within the time frame mentioned above & as per the decision of engineer in-charge.

e) The department reserves the right to allow the main firm to submit additional Documents/ additional names of the specialized agency in case of the deficiencies in documents or in case of no specialized agency getting qualified in respect of respective subheads. The same will have to be complied with the main contractor within the time allowed. The decision of the department shall be firm & binding on the intending bidders.

f) It is the responsibility of main contractor to check the credentials submitted by specialized agency. If at any stage, it is found that the credentials submitted by the specialized agency is fake or false in that case amount equivalent to 50% of EMD amount of the main contractor will be forfeited per reference.

g) In event of the concerned agency not performing satisfactorily or failure of specialized agency or as stated in Para (f) above, the main contractor on the written direction of the department, shall remove the specialized agency deployed on the work and shall submit name of new specialized agency who fulfills the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Such specialized agency shall also enter into Agreement with the main tenderer and shall meet all the guarantee for the equipment already supplied for which payment has been released by the department in part. If any equipment supplied for the work, during the currency of the earlier specialized agency and paid partly by the department becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of work, the main contractor shall be liable for

replacement of the equipment(S) at no cost to Department.

h) No change of specialized agency will be allowed without prior approval of the EIC.

i) The main contractor shall be responsible and liable for proper and complete execution of the work and ensure coordination among all specialized agencies for executing the E&M works including the constriction Civil Work.

j) “After successful commissioning of the system, and while handing over the system to AAl, the System Providers / OEMs / Contracting Agency shall provide the complete set of usable Software, Source Code, Executable Code, Password, Software Design Document and any Specialized Development Tool etc. of the entire system to AAI for enabling access and use of the same by AAl or its authorized agency for future modification / extension / upgradation /interfacing or integrating with new system etc. The System Provider / OEM / Contracting Agency shail provide exclusive tight to AAI and indemnify AAI or AAI nominated agency for usages / modification of Software, Source Code, Executable Code, Password, Software Design Document and any Specialized Development Tool against any liabilities, losses, claim or proceedings etc.

At the time of commissioning of the system, the agency should sincerely demonstrate compatibility of their source code/passcode, executable code, software design document etc. with any other OEM’s equipment for which all necessary required hardware/software shall be the responsibility with agency & provided without any cost to AAI.

The System Provider / OEM / Contracting Agency shall also support to AAI and ensure that Software, Source Code, Executable Code, Password, Software Design Document and any Specialized Development Tool are workable during the entire service life of the system without any additional cost. Final bill of the bidder shall be released only upon submission of the same. Further, any update / modifications done in the system Software, Source Code, Executable Code, Password, Software Design Document and any Specialized Development Tool shall also be submitted to AAI.

If System Provider / OEM / Contracting Agency is not submitting the charges shall assess the cost of such support and necessary recovery shall be made from the dues of the System Provider / OEM / Contracting Agency available with AAI. The cost shall be assessed by the EIC following codal procedure standard by obtaining budgetary offer / MR analysis.

The above clause is not applicable for software licenses taken in the scope of work for general purpose software like Operating systems, tools, antivirus software etc.

"APPENDIX-EB"

Eligibility criteria for selection of Specialized Agencies for executing Electrical Works:

Sl. No.	Specialized Work	Base Cost	Qualifying criteria for the firms
1	GLF and associated works.	Shall be as per quoted amount for Electrical work	The agency should have valid electrical license issued by appropriate licensing authority and Should have successfully completed or substantially completed work of "SITC of Airfield Ground Lighting Facilities (GLF) like Elevated/ Inset type AGL light fittings, CCR's, Cables etc. and associated works", in line with following criteria of value of work during last seven years ending on last date of submission of bid by main contractor. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the date of bid opening (cover-I/Technical bid). a) Three separate works each costing not less than 40% of base cost*. or b) Two separate works each costing not less than 50% of base cost*. or c) One work costing not less than 80% of base cost*. d) Client certificates stating reference to order, value of work, date of start, date of completion (Actual & as per satisfactory completion agreement), certificates etc., shall be submitted for short listing the agency for execution of specialized work. Substantial completion shall be based on 80 (eighty) per cent (value wise) or more works completed under the contract. Substantial completion should not be defined in terms of percentage completion rather it should be based on functional consideration. Certificate for 'substantial completion' of project/work/asset should contain

			two parts: Part-I shall contain 'financial value of work done' and Part-II shall contain 'certificate of functional completion of project/work/asset'.
2	High Mast & Perimeter lighting	Shall be as per quoted amount for Electrical work	The agency should have valid electrical license issued by appropriate licensing authority and Should have successfully completed or substantially completed work of "SITC of High Mast/ Street lights/Perimeter lights including external electrifications", in line with following criteria of value of work during last seven years ending on last date of submission of bid by main contractor. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the date of bid opening (cover-I/Technical bid). a) Three separate works each costing not less than 40% of base cost*. or b) Two separate works each costing not less than 50% of base cost*. or c) One work costing not less than 80% of base cost*. d) Client certificates stating reference to order, value of work, date of start, date of completion (Actual & as per satisfactory completion agreement), certificates etc., shall be submitted for short listing the agency for execution of specialized work. Substantial completion shall be based on 80 (eighty) per cent (value

			wise) or more works completed under the contract. Substantial completion should not be defined in terms of percentage completion rather it should be based on functional consideration. Certificate for 'substantial completion' of project/work/asset should contain two parts: Part-I shall contain 'financial value of work done' and Part-II shall contain 'certificate of functional completion of project/work/asset'.

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FORM - A

DETAILS OF SIMILAR WORKS SUCCESSFULLY COMPLETED OR SUBSTANTIALLY COMPLETED DURING THE LAST SEVEN YEARS ENDING ON LAST DAY OF MONTH PREVIOUS TO THE ONE IN WHICH TENDER ARE INVITED i.e. 30.06.2026

Sl. No.	Details of Work	Work-1	Work-2	Work-3
i	Name of work/ project and Location			
ii	Name and Address of client			
iii	Awarded Cost of work (in Rs. Lakhs)			
iv	Date of Commencement as per contract			
v	Stipulated Date of completion			
vi	Actual date of completion			
vii	Completion cost/Actual Work done			
viii	Whether the work was done on back to back basis Yes/No			

SIGNATURE (S) OF BIDDER (S)
(WITH STAMP)

Note: The contractor should give list of only of eligible category works of requisite amount with supporting documents issued from client.

FORM-B

FINANCIAL INFORMATION

Name of the firm / contractor……..

1. Financial Analysis - Details to be furnished turnover on construction works with profit / loss as per figure in balance sheet account for the last three years duly certified by the Chartered Accountant as submitted by the applicant to the Income - Tax Department

Fig in lakhs Rs.

Sl. No.	**Particulars**	**Financial Year (Last Three Audited Years)**		
		2024-25	2023-24	2022-23
1	Turn-over on construction Works (i/c GST)			
2	Profit/Loss after Taxes (Standalone)			

2. Financial arrangements for carrying out the proposed work.

Unique Document Identification Number (UDIN)……..

Signature of Chartered Accountant with Seal

Signature(s) of Bidder(s)

Note: The bidder should give information strictly in above format.

FORM-C

FORM FOR CERTIFICATE OF NET WORTH FROM CHARTED ACCOUNTANT

This is to certify that as per audited balance sheet and profit & loss account during the financial year ....., the Net Worth of M/s…….. (Name & registered address of Individual / Firm / Company), as on …….. (the date of certificate) is Rs …….. after considering all liabilities. It is further certified that Net Worth of the company has not eroded by more than 30% in last three years ending on **31.03.2025.**

Unique Document Identification Number (UDIN)……..

Signature of Charted Accountant
……..

Name of Charted Accountant
……..

Membership of ICAI

Date and Seal

SIGNATURE (S) OF BIDDER (S)

FORM-D

FINANCIAL DATA
(WORK DONE DURING LAST FIVE FINANCIAL YEARS)

Name of the Bidder: -_____

SI. NO.	Description	Financial Data for Last Five Audited Financial Years				
		2024-25	2023-24	2022-23	2021-22	2020-21
1	Maximum value of Civil Engineering Works executed in any one year during the last 5 (five) years (updated the completed works to current costing level of enhancing at a simple rate of interest @ 7% per annum.) **(excluding GST)**					

Note:

a. All such documents reflect the financial data of the tenderer or member in case of JV/Consortium, and not that of sister or parent company.

b. The financial data in above prescribed format shall be certified by Chartered Accountant/ Company Auditor under his signature and stamp in original along with membership no.

Unique Document Identification Number (UDIN)……

Signature of Chartered Accountant with Seal

SIGNATURE (S) OF BIDDER (S)

FORM-E

WORKS IN HAND

(On or after the Bid Submission Start Date)

Name of Bidder: -

Name and Brief contract (Clearly indicate the part of the work assigned to the bidder (S)	**Name of client with Telephone Number and Fax Number**	**Contract Value in Rupees (Give only the value of Work assigned to the bidder (s)**	**Value of balance work yet to be done in Rupee as On Bid Submission End date**	**Value of work to be done in 'T' i.e. 01-year (12 months) w.e.f. Bid Submission End date (excluding GST) From Bid submission end date To Bid submission end date + 12 months**

Unique Document Identification Number (UDIN)……

Signature of Chartered Accountant with Seal

SIGNATURE (S) OF BIDDER (S)

FORM - F

ANNUAL VALUE OF GENERAL CONSTRUCTION WORK DURING THE LAST FIVE YEARS ENDING 31.03.2025

Name of the firm / contractor _____

Fig in lakhs Rs.

Sl no.	Particulars	Financial Years (Last Five Audited Financial Years)				
		2024-25	2023-24	2022-23	2021-22	2020-21
1.	Annual Value of General Construction works carried out in the corresponding financial year **(excluding GST)**					
2.	Value of work relevant to the work being procured in the corresponding financial year **(excluding GST)**					

Unique Document Identification Number
(UDIN)……

SIGNATURE OF CHARTERED ACCOUNTANT WITH SEAL

SIGNATURE (S) OF BIDDER (S)

FORM – G

AVERAGE MONTHLY FINANCIAL TURNOVER / PROGRES IN ONE GENERAL CONSTRUCTION WORK DURING THE LAST SEVEN YEARS ENDING ON 31.12.2025

This is to certify that the average monthly financial turnover/progress of M/s…… (Name & registered address of Individual / Firm / Company), is Rs …… per month **(i/c GST)** in one general construction work, ……**(Name of Work)**…… during the last seven years ending on 31.12.2025.

Note:

i) The cost of individual one works considered for monthly turnover should not be less than Rs……. cr. (40% of estimated cost plus GST).

ii) For this purpose, cost of work shall mean gross value of the completed work including cost of materials supplied by the Government / client but excluding those supplied free of cost.

iii) The value of average monthly financial progress shall be worked out on the basis of completion cost of work divided by actual duration of completion of work.

iv) This should be certified by an officer not below the rank of Executive Engineer or Chartered Accountant.

v) The value of average monthly financial progress shall be brought to current costing level by enhancing the actual value of monthly turnover of single work at simple rate of 7% per annum calculated from the date of completion to previous day of last day of submission of bids.

Unique Document Identification Number (UDIN) **(if certified by CA)**……

SIGNATURE OF CHARTERED ACCOUNTANT WITH SEAL **(if certified by CA)**

SIGNATURE OF EXECUTIVE ENGINEER WITH SEAL **(if certified by EE)**

Whichever is applicable

SIGNATURE (S) OF BIDDER (S

ANNEXURE-1

TENDER ACCEPTANCE LETTER
(To be given on Contractor's Letter Head)

Date:

To,

(Bid Manager)
Address
_____
_____
_____

Sub: Acceptance of Terms & Conditions of Tender.

(Tender ID No: _____)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from CPP Portal web site(s) namely: https://etenders.gov.in/eprocure/app as per your advertisement, given in the above-mentioned website(s).

2. I / We hereby certify that I / we have inspected the site and read the entire terms and conditions of the tender documents, corrigendum(s) and reply to query if any made available to me/ us which shall form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

3. I / We hereby unconditionally accept the tender conditions of AAI's tender documents in its totality / entirety for above mentioned work.

4. I/We declare that I/We have not paid and will not pay any bribe to any officer of AAI for awarding this contract at any stage during its execution or at the time of payment of bills, and further if any officer of AAI asks for bribe/gratification, I will immediately report it to the Appropriate Authority in AAI'.

5. I/ We hereby submitted that I/ We paid/ submitted the required earnest money as per NIT conditions.

6. I / We certify that all information/ documents furnished by our Firm is true & correct and in the event at any stage, the information/ documents is found to be incorrect/ untrue or found violated, then we shall be liable for debarment from tendering in AAI without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

ANNEXURE – 2

Advisory: For Applicant and its BG Issuing Bank Branch.

It is to be noted that along with physical BG; we have also activated an online facility to view the issued BG cover message transmitted to ICICI Bank through SFMS platform.

- For availability of BG in this platform, it is necessary that BG issuing/amending bank send the BG advice in the form of message format IFN **760COV (BG Issuance)** / **IFN 767COV (BG Amendment)** via SFMS (Structured Financial Messaging System) as provided by RBI.
- In the event of BG issuing/amending bank not sending the message IFN 760COV/ IFN 767COV or **committing any error while capturing the details** at least in the below field, **BG confirmation through online portal would not be updated.**

Request you to notify your bank (BG issuing bank) to update below details at time of submission of BG issuance/amendment request to their respective banks:

BG advising message – IFN 760COV/ IFN 767COV via SFMS
IFSC CODE: ICIC0000007
Corporate Name- Airport Authority of India

Field Number	Particulars (to be mentioned in Row 1)
7037	<unique identifier> (LIST ATTACHED)

Please note that the issuing bank while issuing/amending the BG, should ensure that the above information is correctly captured in the message i.e. IFN 760COV/ IFN 767COV.

Please find below indicative request letter format to be sent to issuing bank for ensuring transmission of BGs through SFMS.

S No.	Name of the AAI Unit	Email ID	UNIQUE IDENTIFIER CODE (7037)
1	Corporate Headquarters	precheckbgv@aai.aero	AAICORHQ
2	RHQ-NR	bgv.rhqnr@aai.aero	AAIRHQNR
3	JAMMU	bgv.jammu@aai.aero	AAIJAMMU
4	SRINAGAR	bgv.srinagar@aai.aero	AAISRINAGAR
5	AMRITSAR	bgv.amritsar@aai.aero	AAIAMRITSAR
6	CHANDIGARH	bgv.chandighar@aai.aero	AAICHANDIGHAR
7	JAIPUR	bgv.jaipur@aai.aero	AAIJAIPUR
8	JODHPUR	bgv.jodhpur@aai.aero	AAIJODHPUR
9	UDAIPUR	bgv.udaipur@aai.aero	AAIUDAIPUR
10	KHAJURAHO	bgv.khajurao@aai.aero	AAIKHAJURAO
11	CATC ALLAHABAD	bgv.catc@aai.aero	AAICATC

12	SAFDARJUNG AIRPORT	bgv.safdarjung@aai.aero	AAISAFDARJUNG
13	VARANASI	bgv.varanasi@aai.aero	AAIVARANASI
14	DEHRADUN	bgv.dehradun@aai.aero	AAIDEHRADUN
15	RHQ-WR	bgv.rhqwr@aai.aero	AAIRHQWR
16	INDORE	bgv.indore@aai.aero	AAIINDORE
17	BHOPAL	bgv.bhopal@aai.aero	AAIBHOPAL
18	RAJKOT	bgv.rajkot@aai.aero	AAIRAJKOT
19	VADODRA	bgv.vadodra@aai.aero	AAIVADODRA
20	SURAT	bgv.surat@aai.aero	AAISURAT
21	AURANGABAD	bgv.aurangabad@aai.aero	AAIAURANGABAD
22	JUHU	bgv.juhu@aai.aero	AAIJUHU
23	NAGPUR	bgv.nagpur@aai.aero	AAINAGPUR
24	PUNE	bgv.pune@aai.aero	AAIPUNE
25	GOA	bgv.goa@aai.aero	AAIGOA
26	AHMEDABAD	bgv.ahmedabad@aai.aero	AAIAHMEDABAD
27	RHQ-ER	bgv.rhqer@aai.aero	AAIRHQER
28	GAYA	bgv.gaya@aai.aero	AAIGAYA
29	PATNA	bgv.patna@aai.aero	AAIPATNA
30	RANCHI	bgv.ranchi@aai.aero	AAIRANCHI
31	BHUBNESHWAR	bgv.bhubneshwar@aai.aero	AAIBHUBNESHWAR
32	RAIPUR	bgv.raipur@aai.aero	AAIRAIPUR
33	PORTBLAIR	bgv.portblair@aai.aero	AAIPORTBLAIR
34	BAGDOGRA	bgv.bagdogra@aai.aero	AAIBAGDOGRA
35	PAKYONG-SIKKIM	bgv.pakyong@aai.aero	AAIPAKYONG
36	RHQ-SR	bgv.rhqsr@aai.aero	AAIRHQ-SR
37	CALICUT	bgv.calicut@aai.aero	AAICALICUT
38	TRIVANDRUM	bgv.trivandrum@aai.aero	AAITRIVANDRUM
39	COCHIN-CIAL	bgv.cochin@aai.aero	AAICOCHIN
40	COIMBATORE	bgv.coimbatore@aai.aero	AAICOIMBATORE
41	MADURAI	bgv.madurai@aai.aero	AAIMADURAI
42	TIRUCHIRAPALLI	bgv.tiruchirapalli@aai.aero	AAITIRUCHIRAPALLI
43	HYDERABAD	bgv.hyderabad@aai.aero	AAIHYDERABAD
44	TRIPUTI	bgv.tripati@aai.aero	AAITRIPATI
45	VIJYAVADA	bgv.vijyavada@aai.aero	AAIVIJYAVADA
46	VISAKHAPATNAM	bgv.visakhapatnam@aai.aero	AAIVISAKHAPATNAM
47	BANGALORE	bgv.bangalore@aai.aero	AAIBANGALORE
48	MANGALURU	bgv.mangaluru@aai.aero	AAIMANGALURU
49	RHQ-NER	bgv.rhqner@aai.aero	AAIRHQNER
50	AGARTALA	bgv.agartala@aai.aero	AAIAGARTALA
51	DIMAPUR	bgv.dimapur@aai.aero	AAIDIMAPUR
52	DIBRUGARH	bgv.dibrughar@aai.aero	AAIDIBRUGHAR

53	SILCHAR	bgv.silchar@aai.aero	AAISILCHAR
54	IMPHAL	bgv.imphal@aai.aero	AAIIMPHAL
55	GUWAHATI	bgv.guwahati@aai.aero	AAIGUWAHATI
56	KOLKATA AIRPORT	bgv.kolkata@aai.aero	AAIKOLKATA
57	CHENNAI AIRPORT	bgv.chennai@aai.aero	AAICHENNAI
58	CHENNAI PROJECT	bgv.chennaiproj@aai.aero	AAICHENNAI PROJECT
59	RAU-SAP	bgv.rausap@aai.aero	AAIRAUSAP

ANNEXURE - 3

UNDERTAKING REGARDING DEBARMENT/BLACKLISTING/RESTRAINMENT
(To be given on Contractor's Letter Head)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

(Tender ID No: _____)

I/We ……(name and post of authorized signatory) on behalf of ……..(Name of firm) do here by solemnly affirm and declare as follows:

i) Our firm is not restrained/debarred/blacklisted by Airports Authority of India (AAI)/Ministry of Civil Aviation (MoCA)/Dept. of Expenditure (DoE), Ministry of Finance and debarment/blacklisting/restrainment is not in force as on last date of opening of tender (Envelop –I, normally called as Technical bid).

ii) None of Proprietor/Partners/Board Members/Directors of M/s……(Name of firm) has remained proprietor/Partner/Board Member/Director in any firm which stand debarred/ blacklisted/ restrained by AAI/ MoCA/ DoE and the debarment/ blacklisting/ restrainment is not in force as on last date of opening of tender (Envelop –I, normally called as Technical bid).

iii) Our firm understands that if our firm either debarred before the date of opening of tender (first bid, normally called as Technical bid, in case of two packet/two stage bidding) or debarred before the date of contract by AAI/MoCA/DoE (Debarment applicable for all Ministries/Departments), our bid is liable to be rejected at that stage.

iv) Our firm understands that at any stage, if above statements are found to be false, our firm shall be liable for debarment from bidding in AAI, apart from any other appropriate contractual legal action including debarment/blacklisting/restrainment, termination of the contract etc. as deemed fit.

Date:

[Signature and name of the
authorized Signatory of the firm]

Place:

ANNEXURE -4

UNDERTAKING FOR DEPLOYMENT OF T&P
(To be given on Contractor's Letter Head)

(Tender ID No: _____)

Name of work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

Name of Contractor / Firm: _____

I / we have applied for issue of tender for the work of "**Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.**
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport." and hereby undertake that: -

1. I / we have gone through the tender documents and drawings in its entirety, visited the site and have understood the nature of work to be executed.
2. I / we will deploy adequate T&P in working condition with adequate standby arrangement for efficient / timely execution of the work.
3. I / we have submitted the details of T&P owned by us and undertake to procure or take on lease the balance T&P for the work as per requirement of the work matching with the work programme.
4. I / we will abide by any instructions by AAI for such procurement / arrangement of T&P on lease as is considered necessary for efficient / timely execution of work.

Encl: List of T&P owned

Signature of Contractor:

Date:

Witness:

ANNEXURE – 5

FORM OF BANK GUARANTEE TO SECURE A LUMP-SUM/ MOBILISATION ADVANCE

(On Non-Judicial Stamp Paper)

To

The Airports Authority India

1. In consideration of the Airports Authority India having its head office at New Delhi (hereinafter called "AAI" which expression shall unless repugnant to the subject or context include its administrators, successors and assigns) having agreed under the terms and conditions (Contract Agreement No. _____ dated _____made between _____ * _____ and AAI in connection with the work of (hereinafter called "the said contract"), to make at the request of the Contractor a lump-sum advance of Rs. _____ (Rupees _____ only) for utilizing it for the purpose of the Contract on his furnishing a guarantee acceptable for AAI we, the Bank (hereinafter referred to as "the said Bank") and having our registered office at do hereby guarantee the due recovery by AAI of the said advance with interest thereon -as provided according to the terms and conditions of the Contract. If the said Contractor fails to utilize the said advance for the purpose of the Contract and/or the said advance together with interest thereon as aforesaid is not fully recovered by AAI we, the _____ Bank hereby unconditionally and irrevocably undertake to pay to AAI on demand and without demur to the extent of the said sum of Rs _____ (Rupees _____only) any claim made by AAI on us for the loss or damage caused to or suffered by AAI by reason of not being able to recover in full the said sum of Rs _____ (Rupees _____only) with interest, as aforesaid.

2. We, the _____ Bank, further agree that AAI shall be the sole judge of and as to whether the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and the extent of loss or damage caused to or suffered by AAI on account of the said advance together with interest not being recovered in full and the decision of AAI that the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and as to the amount or amounts loss or damage caused to or suffered by AAI should be final and binding on us.

3. We, the said Bank, further agree that the Guarantee therein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and till the said advance with interest has been fully recovered and its claims satisfied or discharged and till the

Accepting Authority of the contract certifies that the said advance with interest has been fully recovered from the said Contractor, and accordingly on discharges this guarantee subject, however, that AAI shall have no claim under this Guarantee after 90 (Ninety) days from the date of completion of the said contract, i.e., _____ (date) or from the date of cancellation of the said Contract, as the case may be, unless a notice of the claim under this Guarantee has been served on the Bank before the expiry of the said period in which case the same shall be enforceable against the Bank notwithstanding the fact, that the same is enforced after the expiry of the said period.

4. AAI shall have the fullest liberty without effecting in any way the liability of the Bank under this Guarantee or Indemnity, from time to time to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time and from time to time any of the powers exercisable by it against the said Contactor and either to enforce a forbear from enforcing any of the terms and conditions governing the said Contract or the advance or securities available to AAI and the said Bank shall not be released from its liability under these presents by any exercise by AAI of the liberty with reference to the matters aforesaid or by reason of time being given to the said Contractor or any other forbearance, act or omission on the part of AAI or any indulgence by AAI to the said Contractor or of any other matter or thing whatsoever after I which under the law relating to sureties would but for this provisions have the effect of so releasing the Bank from its such liability.

5. It shall not be necessary for AAI to proceed against the Contractor before proceeding against the Bank if and the Guarantee herein contained should be enforceable against the Bank notwithstanding any security which AAI may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealised.

6. We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of AAI in writing and agree that any change in the Constitution of the said Contractor or the said mess Bank shall not discharge our liability hereunder.

In presence of: Dated this _____ Day of _____

WITNESS

1. For and on behalf of (The Bank)

Signature _____

2. Name & Designation _____

Authorization no. _____
Name & Place_____
Bank's Seal _____

The above Guarantee is accepted by Airports Authority of India.
for and on behalf of Airports Authority of India.

Signature _____
Name & Designation_____
Dated_____

Note:
*__For Proprietary Concerns__
Sh. _____son of' _____resident of _____carrying on business under the name and style of _____at _____(hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

__For Partnership Concerns__
1. Sh. _____son of _____resident of _____
2. Sh. _____son of _____resident of_____
carrying on business in co-partnership under the name and style of _____at _____ (hereinafter collectively called "the said contractor" which expression shall unless the context requires otherwise include each of them and their respective heirs, executors administrators and legal representatives).

__For Companies__
M/s _____a Company registered under the Companies Act, 1956 and having its registered office in the State of (Hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include its administrators, successors and assigns).

ANNEXURE - 6

Work Diary

PART – A

1. Name of Work……
2. Contract Agreement No ……..
3. Date of Acceptance ……
4. Name and Registered address of Contractor……
5. Contract Sum and /or percentage on Schedule of Rate……..
6. Period of Contract……..
7. Name and local address of Contractor/ Contractor's Agent ……..
8. Date of First Works order……
9. Date of handing over the site to contractor ……
10. Date of Commencement of work ……
11. Stipulated date of completion of Contract……..
12. Suspension orders showing duration and authority……..
13. Extended date of completion with authority ……..
14. Date of actual completion of work ……
15. Date of work taken over……...
16. Date of expiry of Maintenance Period ……..

Work Diary

PART – B

DAILY RECORD

1. Weather

2. Workers engaged by Contractor

Skilled				Unskilled			
Category	No	Category	No	Category	No	Category	No
Concreter Bricklayer Mason Carpenter Joiner		Paviour Tiller Painter Polisher		Glazier Plumber		Mate Bhisty Mazdoor (man) Mazdoor (women) Mazdoor (boy)	

3. Important materials brought on site with approximate quantities (rejection, if any, to be stated).

Schedule 'B' materials		Contractor's materials		Rejections	
Materials	Quantity	Materials	Quantity	Materials	Quantity

4. Details of plant, equipment and transport and transport working on site.

	T & P Hired under Schedule 'C'		Contractor's T&P equipment & transport	
T & P	Quantity	Remarks regarding breakdown maintenance etc.	Quantity	Remarks regarding breakdown maintenance etc.
Road Roller Concrete.				

Mixer Tar Roller Transport				

5. Brief particulars of work in progress

_____

6. Important stages completed and passed

_____

7. Remarks of Visiting Officer

_____

Dated signature of Engineer-in-charge

Date of signature of contractor or representative or his authorized agent

ANNEXURE -7

Request Letter: Transmission of Bank Guarantee Cover Message <to be submitted by applicant to BG issuing bank>

Date: _____

The Manager,

(Bank),

(Branch)

Sub: Inclusion of unique identifier code of AAI while transmitting BG cover message where beneficiary bank is ICICI Bank (IFSC – ICIC0000007).

Dear Sir/Ma'am,

I/We, _____, request you to include unique identifier _____ in field 7037 of the SFMS cover message IFN COV 760 (for BG issuance) and IFN COV 767 (for BG amendment) while transmitting the same to the beneficiary bank (ICICI Bank – IFSC – ICIC0000007).

Thanking You,

_____

(Vendor/Customer/Concessionaire)

ANNEXURE -8

CERTIFICATE FROM STATUTORY COST AUDITOR REGARDING REQUIREMENT OF LOCAL CONTENTS

(Scanned copy to be submitted by Bidder in Envelope-I on Cost Auditor's / Accountant's letter head)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

I/We_____(Name of Auditor/ Accountant)_____, the Statutory Cost Auditor of M/s____**(Name of company/Firm)**____hereby certify that M/s____**(Name of company/Firm)**____ meets the mandatory minimum Local Content requirement i.e._____ _____(specify the percentage of local contents) as ***'Class-I local supplier'*** as per Government of India, ***"Public Procurement Policy (Preference to Make In India), order 2017"*** amended up to date to participate in AAI Tender ID No._____

Signature and name of the Statutory
Cost Auditor with Rubber Stamp

UDIN No…….

Date:
Place:

ANNEXURE-9

Performa for declaration by Bidder for compliance of order on Restriction under Rule 144(xi) of the General Financial Rules (GFRs)-2017

(Scanned copy to be submitted by Bidder in Cover-I on letter head of Company/Firm)

(Tender ID: _____)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

I, the undersigned, _____ **(full names)**, do hereby declare, in my capacity as _____of M/s____ **(Name of company/Firm)** ____that:

1) I am competent to swear this undertaking on behalf of M/s____ **(Name of company/Firm)** ____

2) I have read the Order(s) on the subject of Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017 regarding restrictions on procurement from a bidder of a country which shares a land border with India and comply to all the provisions of the Order(s).

3) I certify that ***M/s____(Name of company/Firm)____)*** is not from such a country **/** is from such a country, has been registered with the Competent Authority (***strike out whichever is not applicable***). I hereby certify that this BIDDER fulfills all requirements in this regard and is eligible to be considered ***[Where applicable, evidence of valid registration with the Competent Authority is attached]***.

4) I understand that the submission of incorrect data and / or if certificate/ declaration given by M/s**____(Name of company/Firm)____**is found to be false, this would be a ground for immediate termination and further legal action in accordance with law as per Clause 12 of the Public Procurement Order on Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017.

Signature and name of the authorized signatory of the firm
with Rubber Stamp

Date:

Place:

ANNEXURE – 10

UNDERTAKING REGARDING ESI & PF/GST or Pre-GST Taxes
(To be submitted on Company's Letter head)

Name of Work: Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B Type of Aircraft.
SH: Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip and other associated works at Valmiki Nagar Airport. (Recall)

Tender ID- _____

I, (_____, age _____ years S/o _____ proprietor/Managing Partner/ Managing Director of M/s having address do hereby solemnly affirm and state as follows;

I / we have gone through the entire NIT and having understood the same further submit that:

S. No.	Name of Work (For which completion certificate is submitted)	Component included in Completion cost (Percentage/Rs.)	Remarks
1		PF :	
		ESI:	
		GST/Pre-GST taxes:	
2		PF :	
		ESI:	
		GST/Pre-GST taxes:	
3		PF :	
		ESI:	
		GST/Pre-GST taxes:	
4		PF :	
		ESI:	
		GST/Pre-GST taxes:	

Date:

Unique Document Identification Number (UDIN)……..

Signature of Chartered Accountant with Seal

SIGNATURE (S) OF BIDDER (S)

ANNEXURE - 11

LIST OF SPECIALIZED ITEMS / JOB/ WORKS

CIVIL WORKS

a) Termite proofing (Anti-termite Treatment work)
b) Water proofing treatment work
c) Stone work including wall/column cladding
d) Marble work
e) Wood work-
   Flush Doors, Panelling of walls, Iron grills or ornamental type.
f) Steel work:
   Collapsible steel gates, Sliding steel shutters, Rolling steel Shutters, Steel doors and windows, Tubular trusses (not ordinary steel trusses), pre- engineered structured Steel buildings, Steel bridge work, space frames for long span structures, Steel towers for flood lighting in stadium (up to height 50m)
g) Flooring:
   Mosaic and Terrazzo tiles flooring, marble flooring, ceramic tiles, granite or any other polish stone of flooring.
h) Roofing: False ceiling, water proofing of roofs and providing special roofing.
i) Roads/ Pavements: Asphaltic/ Cement concrete works for roads and runways, sealing compound, runway marking paint.
j) Furnishing: Items of furnishing, like pillows in foam rubber, pillow covers, Bed sheets, Curtains and Rubber Mats, carpet, Aluminium glazing.
k) Miscellaneous civil works:
   Works such as under reamed piles, Foundations and pile foundation tanking for basements, Fibrous plaster ceiling. Acoustic treatment and other decorative items such as glass ceiling, sinking of tube wells, Erection of food storage – both slips and flat type. Aluminium doors and windows, Aluminium cladding, curtain wall/structure glazing/frameless glazing. Design fabrication and erection of steel towers, fabrication of hydraulic platform and incinerator and laundry equipment, Fabrication of steel cabin or body of trucks chassis, Fabrication of water and sewage treatment plants.
l) Bridge type Structures except culverts.

Annexure -12

GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF SPECIALIZED WORKS

Specimen Copy

(Separate Warranty/ Guarantee Agreements shall be made for different specialized jobs based on descriptions provided in the Technical/CPWD Specifications)

The Agreement made this ---------- day of ---------- between ---------- son of ---------- of ---------- [hereinafter called the Guarantor of the one part] and the Chairman, AAI [hereinafter called the Authority of other part].

WHEREAS THIS agreement is supplementary to a contract [hereinafter called the Contract] dated ---------- and made between the GUARANTORY OF THE ONE PART and the Chairman, AAI, whereby the Contractor, inter-alia undertook to render the buildings and structures in the said contract recited completely water and leak proof.

AND WHEREAS THE GURANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak proof for five years from the date of giving of water proofing treatment.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and minimum life of such water proofing treatment shall be five years to be reckoned from the date after the maintenance period prescribed in the contract.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose.

[a] Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof.

[b] Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts.

[c] The decision of the Engineer-in-charge with regard to cause of leakage shall be final.

During this period of guarantee the guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction

of the Engineer-in-charge at his cost and shall commence the work such rectification within 7 days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the department by some other contractor at the GUARANTOR's cost and risk. The decision of the Engineer-in-charge as to the cost, payable by the Guarantor should be final and binding.

That if Guarantor fails to execute the water proofing or commits breach there under then the Guarantor will indemnify the Principal and the successors against all loss, damage, cost, expense or otherwise which may be incurred by him by reasons of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government the decision of the Engineer-in-charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator ---------- and by ---------- and for an on behalf of the Chairman, AAI on the day, month and year first above written.

SIGNED, SEALED AND delivered by OBLIGATOR in the presence of: -

1.

2.

SIGNED FOR AND ON BEHALF OF CHAIRMAN, AAI ----------
IN THE PRESENCE OF: -
1.

2.

Annexure -13

Form of Supplementary Agreement

This Agreement made this day the …….. between ……... here in after called the First party which expression shall include his heirs, executors and administrators / their successors and assigns and the Chairman, Airports Authority of India through ……... hereinafter called the Second party which expression shall include his successors assigns, shown as under: -

1. That this Agreement shall be called as Supplementary Agreement to the Agreement No. …….. relating to the construction of …….. entered into by the parties to this agreement.

2. That WHEREAS the first party has substantially completed the execution of the work described in and covered by the Agreement No. ……... except the item mentioned in the schedule annexed to this Agreement And whereas the items of the work mentioned in the schedule annexed to this Agreement can't now be executed on account of non-completion of the sanitary work, electric installation and some other work; and whereas both the parties are desirous that the items mentioned in the schedule annexed to this agreement should be executed by the fist party after the completion of the sanitary work, electric installation and some other work, it is hereby further agreed as under:-

a) That the first party shall and will execute the work covered by the items mentioned in the schedule annexed to this agreement at the rates and as per the terms and conditions of the original Agreement no. ……... whenever called upon to do so by the Engineer-In-Charge, within a period of one year from the date hereof.

b) That the first party shall have absolutely no claim of whatsoever nature against the second party for doing the work mentioned in the schedule annexed to this Agreement as required under clause (a) above, except that which he would be entitled to under the original Agreement No……

c) That the first party shall be liable to execute all other items arising out of the original Agreement No…….. which in the opinion of the Engineer-In-Charge are necessary.

d) That the first party shall start with the work of the remaining items mentioned in the schedule annexed to this Agreement within …….. days from …….. on the receipt of a letter to the effect from the Engineer-In-Charge or from any date fixed in the said letter and shall complete the said work within the time fixed by the said Engineer-In-Charge or as extended by him from time to time.

e) That on the due execution and completion of this agreement by the parties, the bill of the first party in relation to the work already done by him under

the original Agreement No…….. shall be provisionally finalized by the second party and payment on account, if any amount is due, shall be made to the first party provided that the second party shall have a right to retain such amount as is considered reasonable by him as a security for the execution of the work mentioned in the scheduled annexed to this agreement and the second party shall have a right to deal with the said amount of security as the thinks proper under the terms and conditions of the original agreement. Further, on the due execution and completion of this agreement, the first party should be entitled to claim back his security deposit relating to the work in question, subject to the right of the second party to retain such amount as he thinks reasonable as mentioned above soon after the maintenance period of ___ month(s), as the case may be mentioned in Clause …….. of the original agreement, is over.

f) That the final bill relating to the entire work under the two agreements should be prepared after the completion of the entire work covered by Agreement No…… and this agreement.

3. Except as modified by this agreement the said Agreement No……... shall remain in full force and effect.

IN WITNESS WHEREOF THE ABOVE MENTIONED PARTIES HAVE PUT THEIR signature on this day the……..

_____	_____
(Signature of Contractor)	(Signature of accepting authority For and on behalf of Chairman, Airports Authority of India
_____	_____
(Signature of Witness)	(Signature of Witness)
_____	_____
Name & address of witness	Name & address of witness

Annexure -14

Format for Tripartite Agreement in Case of Composite Contracts

1. We M/s _____ hereby inform the department that works covered under following subheads shall be executed by M/s _____ on our behalf and will act as specialized Agency. They will execute complete work according to scope of work and tender specification under agreement no. _____ dated _____. The rates, terms and conditions and performance of the system are hereby promised as per our obligations in the above agreement.

Sl.	Nature of work	Subhead no.	Value of work under this subhead
1.1			
1.2			
1.3			

2. We M/S.....here by agree to undertake the specialized items/ jobs covered under subheads indicated above on behalf of main Agency. We hereby agree to abide by followings as specified in the agreement No.....dated .....executed between main agency M/s _____ and AAI.

   2.1 We M/S.....here by confirm that we have studied complete scope of work and tender specifications for the subheads to be executed by us.

   2.2 The work shall be executed by us as per specifications of work & terms and conditions of the contract under above subheads.

   2.3 The performance tests of the system shall be conducted and results are promised to meet requirement indicated in tender specification.

   2.4 We also promise to provide warranty for the system/components during defect liability period.

   2.5 We agree to undertake AMC/CMC for the system after plant/system is taken over by the department.

3. We as main contractor M/s _____ agree to the arrangement of deduction of security deposit, income tax and part rate for incomplete work or deduction required for other reason shall be made as per contract conditions from our each running bill.

4. We as main contractor M/s _____ agree to the arrangement of direct payment to M/s_____ @ _____ % of net payment (The value of net

5. payment due shall be determined after deduction under Para 3 above) of each running account bill for above subheads which has been agreed by our associates M/s_____.

6. We M/s_____ as associate of M/s _____ agree to complete the specialized work within our scope of work including testing and commissioning of the systems along with completion of main work.

7. We M/s_____ as associate of M/s _____ agree to attend all meetings by AAI as and when called for. We also agree to abide by instructions/directions issued by AAI time to time.

8. We M/s_____ as associate of M/s _____ agree to abide by all security instructions and directions during execution of work.

9. I on behalf of Chairman, AAI agree to the conditions signed by other two parties.

Name
Signature
On behalf of M/s _____
Main contractor

Name
Signature
On behalf of M/s _____
Associate agency
For specialized work.

Name
Signature
Designation
On behalf of AAI

TECHNICAL SPECIFICATION

(CIVIL)

1.0 PREAMBLE

1.01 These technical specifications shall be read in conjunction with the various other documents forming the contract, namely Notice Inviting Tender & Instructions to Tenderers, Conditions of Contract, Special Conditions of Contract, Bill of Quantities and other related documents, together with any addendum issued thereto.

1.02 Absence of terms such as providing, supplying, laying, installing, fixing etc. in the description does not even remotely suggest that the contractor is absolved of such providing, supplying etc. unless an explicit stipulation is made in this contract. The owner shall bear no costs of materials, equipment's duties, taxes, royalties etc.

1.03 The classification of various items of work for purpose of measurements and payments shall be as per bills of quantities (BOQ). Except where distinguished by the BOQ, the rates apply to all heights, depths, sizes, shapes and locations. They also cater for all cuts and wastages.

1.04 The specifications may have been divided in different sections/sub-head for convenience only. They do not restrict any cross-reference. The Contractor shall take in to account inter-relations between various parts of works/trades. No claim shall be entertained on basis of compartment interpretations.

2.0 OBLIGATIONS OF THE CONTRACTOR

2.2 In order to ensure that the contract work is executed strictly in accordance with this Agreement and in time, the Contractor shall have the following obligations at no extra cost to AAI in addition to such other obligations and responsibilities as have been specified elsewhere in this Contract.

i) Provision of adequate number of constructional Plant and machinery for mechanized system of construction, handling and transportation;

ii) Fulfil all the Contractor's labour regulations i.e. fair wages, display of notices regarding wages, payment of wages, labour records, attendance cards-cum-wage slips, labour welfare etc. as per standard practices and norms applicable at site;

2.3 All fossils, gold, silver, oil and other minerals, precious stones, coins, article of value, of antiquity and structures and other remains/ things of geological or archaeological interest discovered on the site of the works shall be notified` by the Contractor immediately to the Engineer-in-Charge for onward information to the concerned authorities.

2.4 The Contractor shall take all reasonable precaution to prevent his workmen or any other person from removing or damaging any such article(s) or thing(s) and protect the same till the removal as per the instructions of the Engineer-in-Charge.

2.5 Clearance of the site of all rubbish, debris, materials, temporary structures, plant and machinery, scaffoldings and filling of all pits, excavation and hand over the site in a tidy and clean condition after completion of the work.

2.6 Opening up of covered work, if instructed by the Engineer, if such covering was done before inspection by the Engineer or without permission/ approval from the Engineer-in-Charge.

3.0 GENERAL

3.2 The works will be executed as indicated in the nomenclature of each item and technical specifications as given hereunder as made applicable to this contract.

3.3 In the absence of any definite provision in the technical specifications contained herein, reference may be made to the latest AAI pavement specification, MoRTH & IRC in that order for pavement works and CPWD, ICAO Specifications and IS codes, in that order for other works. Wherever these are silent, the construction and completion of the works shall conform to sound engineering practice and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer-in-Charge shall be final and binding on the Contractor.

3.4 In addition, the abbreviations CPWD, IRC, MoRTH, IS, BS, ICAO, ASTM, AASHTO shall be considered to have the following meaning: -

CPWD	Central Public Works Department
IRC	Indian Road Congress
MoRTH	Ministry of Road Transport and Highways, Government of India
IS Standards	Indian Standard of the Bureau of Indian
BS	British Standard of the British Standard
ICAO	International Civil Aviation Organization
ASASTM	American Standards of the American Society of Testing Materials
AASHTO	American Association of State Highway and Transportation Officials

3.5 All the codes of practice, standards and specifications applicable shall be the latest editions with up to date correction slips etc. or as directed by the Engineer-in-Charge.

3.6 All the Job Mix design shall be got designed by the agency from the laboratory approved by AAI/IITs/NITs/Govt. Engineering College and the cost of mix design shall be borne by the agency and noting extra is payable on this account.

4.0 SUBMISSION AND APPROVAL OF PROPOSED FINISHED LEVELS AND PROFILE

There is provision to take spot levels specified in various item before commencement of that item. The contractor after taking complete spot levels shall submit the proposed finished levels and profile along with anticipated quantity of item(s) as per ICAO to Engineer-in-Charge for his approval. The contractor will revise the same, in case any modification is suggested by Engineer-in-Charge in finished levels/profile, before his approval. Nothing shall be paid extra on this account.

This document consists of technical specifications of items listed below. Contractor to note that execution of all other items included in the tender shall be carried out in accordance to latest MoRT&H, CPWD, IRC, ICAO Specifications and IS codes, in that order. Wherever these are silent, the construction and completion of the works shall conform to sound engineering practice and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer-in-Charge shall be final and binding on the Contractor.

Item No. 04 : Preparation of granular sub-base by providing close graded material, conforming to specifications mixing in a mechanical mix plant at OMC, carriage of mixed material by mechanical transport to work site, for all leads and lifts, spreading in uniform layers of specified thickness with mechanical means including neatly leveling & dressing on prepared surface and compacting with vibratory power roller to achieve the desired density, complete and as per direction of Engineer-in-charge.

PARTICULAR SPECIFICATION OF GRANULAR SUB BASE

1 Scope

This work shall consist of laying and compacting well-graded material on prepared sub- grade in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub-base hereinafter) as necessary according to lines, grades and cross- sections shown on the drawings or as directed by the Engineer-in charge.

The thickness of a single compacted GSB layer shall not be less than 75 mm. When vibrating or other approved types of compacting equipment are used, the compacted depth of a single layer of the sub-base course may be increased to 200 mm upon approval of the Engineer-in-charge.

2 Materials

2.1 The material to be used for the work shall be natural sand, crushed gravel, crushed stone, crushed slag, or combination thereof depending upon the grading required. Use of materials like brick metal, kankar and crushed concrete shall be permitted in the lower sub-base. The material shall be free from organic or other deleterious constituents and shall conform to the grading given in Table 1 and physical requirement given in Table 2. Gradings III and IV shall preferably be used in lower sub-base. Gradings V and VI shall be used as a sub-base cum drainage layer. The grading to be adopted for a work shall be as specified in the contract.

If the water absorption of the aggregate determined as per IS: 2386 (Part 3) is greater than 2 percent, the aggregate shall be tested for Wet Aggregate Impact Value (AIV) (IS: 5640). Soft aggregate like Kankar, brick ballast and laterite shall also be tested for Wet AIV (IS: 5640).

Table: -1. Grading for granular sub-base material.

IS Sieve Designation	Percent by Weight Passing the IS Sieve					
	Grading I	Grading II	Grading III	Grading IV	Grading V	Grading VI
75.0 mm	100	-	-	-	100	-
53.0 mm	80-100	100	100	100	80-100	100
26.5 mm	55-90	70-100	55-75	50-80	55-90	75-100
9.50 mm	35-65	50-80	-	-	35-65	55-75
4.75 mm	25-55	40-65	10-30	15-35	25-50	30-55
2.36 mm	20-40	30-50	-	-	10-20	10-25
0.85 mm	-	-	-	-	2-10	-
0.425 mm	10-15	10 -15	-	-	0-5	0-8
0.075mm	<5	<5	<5	<5	-	0-3

Table 2: Physical Requirement for Materials for Granular Sub-base.

Aggregate Impact Value(AIV)	IS:2386(Part 4) or S:5640	40 Maximum
Liquid Limit	IS:2720(Part 5)	Maximum 25
Plasticity Index	IS:2720(Part 5)	Maximum 6
CBR at 98% dry density IS:272-(Part 8)	IS:2720(Part 5)	Minimum 30 specified nless otherwise specified the Contract

2.2 Strength of sub-base

It shall be ensured prior to actual execution that the material to be used in the sub- base satisfies the requirements of CBR and other physical requirements when compacted and finished.

When directed by the Engineer-in-charge, this shall be verified by performing CBR tests in the laboratory as required on specimens re-moulded at field dry density and moisture content and any other tests for the "quality" of materials as may be necessary.

3 Construction Operations

3.1 Spreading and compacting

The sub base material of grading specified in the Contract and water shall be mixed mechanically by a suitable mixture equipped with provision for controlled

addition of water and mechanical mixing so as to ensure homogeneous and uniform mix. The required water content shall be determined in accordance with IS: 2720(Part-8). The mix shall be spread on the prepared sub grade with mechanical means of adequate capacity its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means as approved by the Engineer-in-charge.

The moisture content of mix shall be checked in accordance with IS:2720 (Part-2) and suitably adjusted so that at the time of compaction it is from 1-2% below the optimum moisture content.

Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations, as in small-sized jobs. The equipment used for mix-in place construction shall be a rotavator or similar approved equipment capable of mixing the material to the desired degree. If so desired by the Engineer-in-charge, trial runs with the equipment shall be carried out to establish its suitability for the work.

Immediately after spreading the mix, rolling shall be done by an approved roller. If the thickness of the compacted layer does not exceed 100mm, a smooth wheeled roller of 80 to 100 KN weight may be used. For a compacted single layer up to 200mm, the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 KN static weights capable of achieving the required compaction. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional cross fall or on super elevation. For pavement having cross fall on both sides rolling shall commence at the edges and progress towards crown.

Each pass of the roller shall uniformly overlap not less than one third of the track made in the preceding pass. During rolling, the grade and crossfall (camber) shall be checked and any high spots or depressions, which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 Km per hour.

Rolling shall be continued till the density achieved is at least 98% of the maximum dry density for the material determined as per IS: 2720 (Part 8). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re-compacted.

4 Surface Finish and Quality Control of Work

4.1 General

All works performed shall conform to the lines, grades, cross-sections and dimensions shown on the drawings or as directed by the Engineer-in-Charge, subject to the permitted tolerances described herein-after.

4.2 Horizontal Alignment:

Horizontal alignment shall be reckoned with respect to the centre line of the carriageway as shown on the drawings. The edges of the carriageway as constructed shall be correct within a tolerance of ±10 mm there from. The corresponding tolerance for edges of the pavement and lower layers of pavement shall be ±25 mm.

4.3 Surface levels:

The top level of the granular sub-base shall not vary from those calculated with reference to the longitudinal & cross profile of the pavement shown in the Drawings or as directed by Engineer-in-Charge, beyond the tolerances mentioned as follow:

S.No.	Sub-base	Tolerances
1	Flexible pavement	±10 mm
2	Concrete pavement	±6 mm

4.4 Surface Regularity:

The maximum allowable difference between pavement surface and underside of a 3 m straightedge when placed parallel with or at right angles to the centre line of pavement at points decided by the Engineer –in-charge shall not exceed 8 mm.

4.5 Rectification:

Where the surface regularity fall outside the specified tolerances, the Contractor shall be liable to rectify the same up to the satisfaction of Engineer-in-Charge. Where the surface is high, it shall be trimmed and suitably compacted. Where the same is low, the deficiency shall be corrected to scarifying the lower layer and adding fresh material and recompacting to the required density.

4.6 Quality Control:

The following quality control tests shall be carried out at frequencies specified against each for Granular Sub-base: -

S.No.	Test	Test Method	Frequency (min.)
1	Gradation	IS: 2720 (Part –VI)	One test per 200 m³
2	Atterberg limits	IS: 2720 (Part-V)	One test per 200 m³
3	Moisture Content prior to ompaction	IS: 2720 (Part-II)	One test per 250 m²
4	Density of compacted layer	IS: 2720 (Part-XVIII)	One test per 500 m²
5	Deleterious constituents	IS: 2720 (Part-XVII)	As required
6	C.B.R. (On set of 3 specimens)	IS: 2720 (Part-XVI)	As required
7	Control of Grade, camber thickness nd surface finish	-	Regularly

5 Arrangement of Traffic

No vehicular traffic of any kind shall be allowed on the finished granular sub-base surface till it has dried and the next course laid. In exceptional cases, construction traffic may be allowed with approval of the Engineer-in-Charge for short durations once the course is completely dry provided vehicles move over the full width avoiding any rutting or uneven compaction. The Contractor will take all precautionary measures to prevent any damage to the finished surface till next layer is laid over it.

6 Measurements for Payment

The unit of measurement for Granular Sub Base Course shall be cubic meter of mix placed. This shall be determined from the top levels of the under layer and the final levels of the consolidated GSBC as mentioned below:

Before laying GSBC, the top levels of under layer shall be taken jointly by the Engineer- in-Charge or his representative and the contractor at 3 meters intervals both ways or closer as directed by the Engineer-in-Charge. These levels shall be recorded on the plan as well as in the level book and record shall be signed by the contractor. The levels of the consolidated GSBC shall again be taken and plotted on the plan and recorded in the level book, to determine the average thickness laid, on the basis of these levels. The volume of mix laid consolidated and finished, shall then be the product of the measured surface area and the average thickness laid.

The protection of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

7 Rate

Unit rate of the item shall include the cost of labour, materials and equipment, mix design, mixing, transportation, placing, compacting, finishing and other quality control operations, field & lab tests, all royalties, fees, storage, rents, all leads and lifts.

Item No.05 : Providing, laying, spreading and compacting graded stone aggregate (size range 53 mm to 0.075 mm) to wet mix macadam (WMM) specification including premixing the material with water at OMC in mechanical mix plant, carriage of mixed material by tipper to site, for all leads & lifts, laying in uniform layers with mechanical paver finisher in sub- base / base course on well prepared surface and compacting with vibratory roller of 8 to 10 tonne capacity to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge.

PARTICULAR SPECIFICATION FOR WET MIX MACADAM SUB-BASE/BASE

1 Scope

This work shall consist of laying and compacting clean, crushed, graded aggregate and granular material, premixed with water to a dense mass on a prepared sub grade/sub- base/base or existing pavement as the case may be in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as necessary to lines, grades and cross-sections shown on the approved drawings or as directed by the Engineer-in-Charge.

The thickness of a single compacted Wet Mix Macadam layer shall not be less than 75 mm. When vibrating or other approved types of compacting equipment are used, the compacted depth of a single layer of the sub-base course may be increased to 150 mm upon approval of the Engineer-in-Charge.

2 Materials

2.1 Aggregates

2.1.1 Physical requirements:

Coarse Aggregates shall be crushed stone. If crushed gravel/shingle is used, not less than 90 percent by weight of the gravel/shingle pieces retained on 4.75 mm sieve shall have at least two fractured faces. The aggregates shall conform to the physical requirement set forth in Table-1.

Table 1: Physical Requirements of coarse aggregates for WMM for Sub-base / Base course.

Test	Test Method	Requirements
Los Angeles Abrasion value r Aggregate Impact value	IS: 2386 (Part 4) IS : 2386 (Part 4) or	40 per cent (Max.) 30 per cent (Max.)
Combined Flakiness and Elongation Indices (Total)	IS : 2386 (Part 1)	35 per cent (Max.) *

* To determine this combined proportion, the flaky stone from a representative sample should first be separated out. Flakiness index is weight of flaky stone metal divided by weight of stone sample. Only the elongated particles are to be separated out from the remaining (non-flaky) stone metal. Elongation index is weight of elongated particles divided by total non-flaky particles. The value of flakiness index and elongation index so found are added up.

If the water absorption value of the coarse aggregate is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS: 2386 (Part 5).

2.1.2 Grading requirements

The aggregate shall conform to the grading given in table below:

Table 2: Grading Requirements of aggregates for Wet Mix Macadam

IS Sieve designation	Per cent by weight passing the IS sieve	Control Grading Band Tolerances Percent
53 mm	100	0
45 mm	95 – 100	±5
26.50 mm	-	-
22.40 mm	60 – 80	±8
11.20 mm	40 – 60	±8
4.75 mm	25 – 40	±8
2.36 mm	15 – 30	±8
600 micron	8 – 22	±5
75 micron	0 – 5	±3

The job control band tolerances in the Table 2 shall be applied to final gradation to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

Materials finer than 425 microns, shall have Plasticity Index (PI) not exceeding 6.

The final gradation approved within these limits shall be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa.

3 Construction operations

3.1 Preparation of Base:

The surface of the sub grade/sub-base/base to receive the wet mix macadam course shall be prepared to the specified grade and camber and clean of dust, dirt and other extraneous material. Any ruts or soft yielding places shall be corrected in

an approved manner and rolled until firm surface is obtained if necessary by sprinkling water.

As far as possible, laying wet mix macadam course over existing bituminous layer may be avoided since it will cause problems of internal drainage of the pavement at the interface of two courses. It is desirable to completely pick out the existing thin bituminous wearing course where wet mix macadam is proposed to be laid over it.

3.2 Provision of lateral confinement of aggregates:

While constructing wet mix macadam, arrangement shall be made for the lateral confinement of wet mix. This shall be done by laying materials in adjoining shoulders along with that of wet mix macadam layer and following the sequence of operations as follows:

The sequence of operations shall be such that the construction of paved shoulder is done in layers each matching the thickness of adjoining pavement layer. Only after a layer of pavement and corresponding layers in paved and earth shoulder portion have been laid and compacted, the construction of next layer of pavement and shoulder shall be taken up.

Where the materials in adjacent layers are different, these shall be laid together and the pavement layer shall be compacted first. The corresponding layer in paved shoulder portion shall be compacted thereafter, which shall be followed by compaction of earth shoulder layer. The adjacent layers having same material shall be laid and compacted together.

3.3 Preparation of mix:

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced/positive mixing arrangement like pug mill or pan type mixer of concrete batching plant.

The plant shall have the following features:

i For feeding aggregates – three/four bin feeders with variable speed motor.

ii Vibrating screens for removal of oversized aggregates.

iii Conveyer belt

iv Control system for addition of water

v Forced/positive mixing arrangement like pug mill or pan type mixture.

vi Centralised control panel for sequential operation of various devices and precise process control

viiSafety devices.

Optimum moisture for mixing shall be determined in accordance with IS: 2720 (Part 8) after replacing the aggregate fraction retained on 22.4 mm sieve with material of 4.75 mm to 22.4 mm size. While adding water, due allowance shall be

made for evaporation losses. However, at the time of compaction, water in the wet mix shall not vary from the optimum value by more than agreed limits. The mixed material should be uniformly wet and no segregation shall be permitted.

For small quantity of WMM work or inaccessible/remote location and in situation of where use of machinery is not feasible, the Engineer-in-Charge may permit the mixing to be done in concrete mixers/manual mixing.

3.4 Spreading of mix:

Immediately after mixing, the aggregates shall be spread uniformly and evenly upon the prepared sub grade/sub-base/base in required quantities. In no case shall these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly completed stretch be permitted.

The mix shall be spread by a paver finisher. The paver finisher shall be self-propelled of adequate capacity with following features:

i Loading hopers and suitable distribution system so as to provide a smooth uninterrupted material flow for different layer thicknesses from the tipper to the screed.

ii Hydraulically operated telescopic screed for paving width upto 8.5 m and fixed screed beyond this. The screed shall have tamping and vibrating arrangement for initial compaction of layer.

iii Automatic leveling control system with electronic sensitive device to maintain mat thickness and cross-slope of mat during laying procedure.

In exceptional cases where it is not possible for the paver to be utilized, suitable mechanical means may be used with the prior approval of Engineer-in-Charge.

The surface of the aggregate shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregate as may be required. The layer shall be tested by depth blocks during construction. No segregation of larger and fine particles shall be allowed. The aggregates as spread shall be of uniform gradation with no pockets of fine materials.

3.5 Compaction:

After the mix has been laid to the required thickness, grade and cross-fall / camber, the same shall be uniformly compacted, to the full depth with suitable roller. If the thickness of single compacted layer does not exceed 100 mm, a smooth wheel roller of 80 to 100 KN weight shall be used. For a compacted single layer up to 150 mm, the compaction shall be done with the help of vibratory roller of minimum static weight of 80 to 100 KN with an arrangement for adjusting the

frequency and amplitude. An appropriate frequency and amplitude may be selected. The speed of the roller shall not exceed 5 Km/hr.

In portions having unidirectional cross-fall / super elevation, rolling shall commence from the lower edge and progress gradually towards the upper edge. Thereafter, roller shall progress parallel to the centre line of the road, uniformly over-lapping each preceding track by at least one-third width until the entire surface has been rolled. Alternate trips of the roller shall be terminated in stops at least 1 m away from any preceding stop.

In portions in camber, rolling shall begin at the edge with the roller running forward and backward until the edges have been firmly compacted. The roller shall then progress gradually towards the centre parallel to the centre line of the road uniformly overlapping each of the preceding track by at least one-third width until the entire surface has been rolled.

Any displacement occurring as a result of reversing of the direction of a roller or from any other cause shall be corrected at once as specified and / or removed and made good.

Along forms, kerbs, walls or other places not accessible to the roller, the mixture shall be thoroughly compacted with mechanical tampers or a plate compactor or any other suitable method decided by the Engineer-in-Charge. Skin patching of an area without scarifying the surface to permit proper bonding of the added material shall not be permitted.

Rolling shall not be done when the sub grade is soft or yielding or when it causes a wave-like motion in the sub-base/base course or sub grade. If irregularities develop during rolling which exceeds 12 mm when tested with a 3m straight edge, the surface shall be loosened and premixed material added or removed as required before rolling again so as to achieve a uniform surface conforming to the desired grade and cross-fall. In no case the use of unmixed material shall be permitted to make up the depressions.

Rolling shall be continued till the density achieved is at least 98 per cent of the maximum dry density for the material as determined by the method outlined in IS: 2720 (Part - 8).

After completion, the surface of any finished layer shall be well closed, free from movement under compaction equipment or any compaction planes, ridges, cracks and loose material. All loose, segregated or otherwise defective area shall be made good to the full thickness of the layer and re-compacted.

3.6 Setting and drying:

After final compaction of wet mix macadam course, the pavement shall be allowed to dry for 24 hours.

4 Opening to Traffic

No vehicular traffic of any kind shall be allowed on the finished wet mix macadam surface till it has dried and the course laid. In exceptional cases, construction traffic may be allowed with approval of the Engineer-in-Charge for short durations once the course is completely dry provided vehicles move over the full width avoiding any rutting or uneven compaction. The Contractor will take all precautionary measures to prevent any damage to the finished surface till next layer is laid over it.

5 Surface Finish and Quality Control of Work

5.1 Surface Regularity:

The maximum allowable difference between pavement surface and underside of a 3m straightedge when placed parallel with or at right angles to the centre line of pavement at points decided by the Engineer-in-Charge shall not be more exceed 8 mm.

5.2 Surface level:

The tolerance in surface level for wet mix macadam shall not vary ±10 mm for machine laid and ±15 mm for manually laid with reference to the longitudinal and cross-profile of the pavement shown on the drawing or as directed by Engineer-in-Charge.

5.3 Quality Control:

The following quality control tests shall be carried out at frequencies specified against each for Wet Mix Macadam.

S.No.	TEST	Test Method	Frequency
i)	Los Angeles Abrasion Value/ Aggregate Impact Value	IS:2386 (Part IV)	One test per 200 cum. of aggregate.
ii)	Grading of mixed aggregate	IS:2386 (Part I)	One test per 100 cum. of aggregate.
iii)	Flakiness Index	IS:2386 (Part I)	One test per 200 cum. of aggregate.
iv)	Plasticity Index	IS:2720 (Part V)	One test per 200 cum. of aggregate.
v)	Moisture content prior to compaction		One test per 200 cum. of aggregate.

S.No.	TEST	Test Method	Frequency
vi)	Density of compacted layer	IS:2720(Part-28)	One test per 500 sqm.

5.4 The materials supplied and the works carried out by the Contractor shall conform to the relevant technical specifications and as approved by the Engineer-in-Charge.

For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control tests, as described above. The testing frequencies set forth are the desirable minimum and the Engineer-in-Charge shall have the full authority to carry out tests as frequently as he may deem necessary to satisfy himself that the materials and works comply with the appropriate specifications.

Test procedures for the various quality control tests are indicated in the respective Section of these Specifications or for certain tests within this Section. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering practice to the directions of the Engineer-in-Charge.

6 Rectification of Surface Irregularity

Where the surface irregularity of the wet mix macadam course exceeds the permissible tolerances or where the course is otherwise defective due to sub grade soil getting mixed with the aggregates, the full thickness of the layer shall be scarified over the affected area, reshaped with added premixed material or removed and replaced with fresh premixed material as applicable and re-compacted in accordance with Clause 3 above. The area treated in the aforesaid manner shall not be less than 5m long and 2 m wide. In no case, the depressions shall be filled up with unmixed and un-graded material or fines.

7 Measurements for Payment

Wet mix macadam shall be measured as finished work in position in cubic meters by level computation method. This shall be determined from the top levels of the under layer and final levels of the consolidated layer as mentioned below: -

Before laying wet mix macadam, the top levels of under layer shall be taken jointly by the Engineer-in-Charge or his representative and the contractor at 3 meter intervals both ways or closer as directed by the Engineer-in-Charge. These levels shall be recorded on the plan as well as in the level book and the record shall be signed by the contractor. The levels of the consolidated wet mix macadam shall again be taken and plotted on the plan and recorded in the levels. The volume of

mix laid consolidated and finished, shall then be the product of the measured surface area and the average thickness laid.

The protection of edges of wet mix macadam extended over the full formation as shown in the drawing shall be considered incidental to the work of providing wet mix macadam and as such no extra payment shall be made for the same.

8 Rates

Unit rate of the item shall include the cost of labour, materials and equipments, mix design, mixing, transportation, placing, compacting, finishing and other quality control operations, field & lab tests, all royalties, fees, storage, rents, all leads and lifts.

Item No.10: Providing and laying of Hot Mix **D**ense **A**sphaltic **C**oncrete **(DAC)** using crushed stone aggregate of quality, size and grading as specified and #filler as specified and Viscosity Grade Bitumen (supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade *(VG-10/VG-20/VG-30) content shall be taken as 135 kg/m^3 of mix supplied in bulk produced by Govt. Refineries and 2% hydrated lime by weight of aggregates as filler material].

* strike out whichever is not applicable.
# Filler in order of preference shall be hydrated lime, stone dust or cement. The necessary cost adjustment shall be made based on JMF & availability of filler.

1.0 Materials

1.1 Coarse Aggregates

This shall consist of a crushed or broken from hard stone obtained from approved quarry. These shall be clean, strong, durable of fairly cubical shape and free from disintegrated, soft, friable, thin elongated or laminated pieces. This shall also be free from dirt, organic, deleterious material and any other foreign matter and adherent coatings. The grading of coarse aggregates shall conform to IS:383.

1.1.1 Physical Properties of Coarse Aggregate

The aggregate shall conform to the following Physical Properties:

Sl. No.	Property	Tests	Test Method	Frequency	Acceptance Criteria
1	Cleanliness	Grain Size Analysis	IS:2386 (Part.I)	Before approval of the quarry and at every subsequent change in the source of supply	Max.5% passing 0.075mm sieve
2	Strength	Aggregate impact value	IS:2386 (Part.IV)	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	Max.24%
		Los Angeles Abrasion value	IS:2386 (Part IV)	-do-	Max. 30%

3	Durability	Soundness (I) Loss with Sodium Sulphate for 5 cycles	IS:2386 (Part V)	One test for each source and whenever there is change in the quality of aggregate	Max. 12%
		(II) Loss with Magnesium Sulphate with5 cycles	-do-	-do-	Max. 18%
4	Particle Shape	Flakiness & Elongation Index (Combined)	IS:2386 (Part I)	One test per 350 Cum of aggregate for each source and whenever there is change in the quality of aggregate	Max. 30%
5	Stripping	Coating and Stripping of Bitumen Aggregate	IS:6241	One test for each source and whenever there is change in source of aggregate	Minimum Retained Coating 95%
6	Water absorption	Water absorption	IS:2386 Part III	-do-	Max. 2%
7	Water Sensitivity	**Retained Tensile strength	AASHTO 283	One test for each mix type whenever there is change in quality or source of coarse or fine aggregate.	Minimum 80%
8	Presence of ferrous sulphide and iron oxide	As per clause 1.1.3	As per clause 1.1.3	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	No Presence of ferrous sulphide and iron oxide

**If the minimum retained tensile strength falls below 80%, use of anti-stripping agent is recommended to meet the minimum requirements.

Where anyone or some of the above conditions cannot be satisfied, the Engineer-in-Charge may allow reasonable tolerances, with the approval of ED(Engg).

1.1.2 Anti-stripping Agent: Anti-stripping agent or additive if required shall be heat stable, shall not change the viscosity of the binder beyond

specifications, shall contain no harmful ingredients, shall be added in recommended proportion by approved method and shall satisfy the requirements as stipulated in MORT&H Appendix-5. The cost of providing anti-stripping agent shall be borne by the contractor and nothing extra shall be paid on this account to the contractor.

1.1.3 Some aggregates may contain ferrous sulfides and iron oxides which can cause stains on exposed concrete surfaces. In areas where staining has been a problem or is suspected, the Engineer should verify that producers and aggregate suppliers have taken steps to prevent the inclusion of any ferrous sulfides or iron oxides in aggregate to be used in the project.

If there is a concern that these may exist, an indicator to identify staining particles is to immerse the aggregate in a lime slurry. If staining particles are present, a blue-green gelatinous precipitate will form within five (5) to 10 minutes, rapidly changing to a brown color on exposure to air and light. The reaction should be complete in 30 minutes. If no brown gelatinous precipitate forms, there is little chance of reaction in concrete.

1.2 Fine Aggregates

Fine aggregate shall consist of crushed or naturally occurring mineral material or combination of two, passing 2.36mm sieve and retained on 0.075mm sieve. No natural sand will be allowed in the wearing course. The fine aggregate shall be clean, hard, durable, dry, and free from dust and soft organic and other deleterious substances. Fine aggregates shall have sand equivalent value not less than 50 when tested in accordance with the requirement of IS:2720 Part 37. The Plasticity Index of fraction of passing the 0.425mm sieve shall not exceed 4 when tested in accordance with IS:2720 Part 5.

1.3 Filler

Filler shall consist of finely divided mineral matter such as hydrated lime or stone dust or cement of quality conforming to relevant IS code as approved by the Engineer-in-charge. The use of hydrated lime is encouraged because of its very good anti-stripping and antioxidant properties. Stone dust or Cement may be used if hydrated lime is not available.

Grading Requirement of Mineral Filler

IS Sieve (mm)	Cumulative % passing by weight of total aggregate
0.6	100
0.3	95 - 100
0.075	85 - 100

The filler shall be inert material free from organic impurities and shall

have Plasticity Index not greater than 4. PI requirement will not apply if filler is hydrated lime or cement.

1.3.1 Cost Adjustment for Filler

For the purpose of tendering, the contractor may base his rate assuming 2% hydrated lime as filler by weight of aggregates. If the actual quantity & type of filler required to be used as per mix design is found to be different from the quantity & type of filler assumed above, necessary adjustment in cost of extra/short filler shall be made as per the rate of filler used in actual supply voucher from manufacturer/ authorized dealer at the time of execution. In the case of authorized distributor, the rate of filler may be authenticated by the manufacturer. In the case of stone dust, the rate as per actual supply voucher shall be used. The rate of cement exclusive of GST shall only be considered for payment.

1.4 Bitumen

The Viscosity Grade Bitumen shall conform to IS:73 and shall be, supplied in bulk by Govt. Refineries. However, in region where bulk bitumen is not available, then packed bitumen may be specified in the tender document. Use of imported Bitumen shall not be allowed. The agencies shall submit copies of the purchase vouchers of the Bitumen to the Engineer-in-Charge.

Selection of VG grade bitumen shall be based upon the climatic conditions of the area as per Table-1 below:

Table-1

Lowest Daily Mean Air Temperature	Highest Daily Mean Air Temperature		
	Less than 20^0C	20 to 30^0C	More than 30^0C
More than -10^0C	VG-10	VG-20	VG-30
-10^0C or Lower	VG-10	VG-10	VG-20

The contractor shall mandatorily provide weigh bridge at the hot mix plant for accurate weighing of materials.

2.0 Combined Grading of Aggregates

In order to satisfy the design requirements for the Dense Asphaltic Concrete (DAC) as laid down in para 3.0, the mix shall contain coarse aggregates, fine aggregates and filler in suitable proportions. True and representative samples of the aggregates proposed to be used on specific job shall be tested in material testing lab (approved by AAI/Govt. institutions i.e. IITs, NITs, Govt. Engg. College etc.) and proper blend of individual aggregates normally available shall be worked out so that the gradation of the final composition shall satisfy the limits laid down below:

Nominal Maximum Aggregate Size*	**13.2 mm**
Layer thickness	**40-50 mm**
IS Sieve (mm)	**Percentage by weight passing**
19	100
13.2	79-99
9.5	68-88
4.75	48-68
2.36	33-53
1.18	20-40
0.6	14-30
0.3	9-21
0.15	6-16
0.075	3-6

* Nominal maximum aggregate size is the largest specified sieve size upon which any of the aggregate material is retained.

Note: Grading in the JMF shall be near to the mid-point to the extent possible.

3.0 Job Mix Formula (JMF)

Twenty days prior to the start of work at site, the job mix formula shall be got determined by the contractor in AAI empanelled or Govt. Institute/laboratory or in-house by Department of Structure, as directed by the Engineer-in-Charge, by Marshall Design Method. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site. The Contractor also shall intimate, in writing, to the Engineer-in-Charge the details of source and location of all materials, their sizes, grading and test results. Besides conforming to the requirements of grading and quality for individual ingredients, the mix shall meet the requirements enumerated below:

S.No.	**Criteria**	**Value**
1	No. of compaction blows on each side of Marshall specimen	75
2	Marshall stability in kN at 60^0C	Not less than 12
3	Marshall flow value in mm for VG Bitumen	2-4
4	Marshall Quotient for Viscosity Grade Paving Bitumen(Ratio of Stability/Flow)	2-5
5	Percentage Voids in Mix (VIM)	3-5
6	Percentage voids in mineral aggregates filled with bitumen (VFB)	70-80%
7	Bitumen(Viscosity Grade) content by weight of mix	As determined in the Lab.

8	Design laboratory density (Bulk density of the Marshall mould)	As determined in the Lab.
9	Retained Marshall Stability on Immersion Test	Not less than 75%
10	Tensile Strength Ratio (TSR) AASHTO 283)- Refer Annexure –I for the outline of AASHTO T 283.	Not less than 80%
11	Voids in mineral aggregates (VMA)	As per table below

Table showing Min VMA values

Nominal Maximum Particle size (mm)*	Min VMA related to designated % air voids**		
	3%	4%	5%
9.5	14	15	16
13.2	13	14	15
19	12	13	14
26.5	11	12	13

* The nominal maximum particle size is one size larger than the first sieve, which retains more than 10% material.

** For intermediate value of designated percentage air voids interpolate the VMA.

Note: Design of mix should also meet the following criteria:

a) A test track of minimum 7m wide and 90m length and shall be of the same depth specified for the construction of the course which it represents, laid and tested by the contractor before commencement of actual work. The core cut from the test track on testing shall give a stability and density of not less than 98% of the respective design values.

b) Texture depth shall be measured by grease patch method and depth obtained by this test shall not be less than 1.0mm.

c) The text patch shall also be tested for friction by AAI surface friction tester at a test speed of 95Km/hour and test water depth of 1.0mm and the value shall not be less than 0.74.

In case of any deficiency, necessary adjustment in Job Mix formula, Plant operation, placing procedures and /or rolling procedure shall be made and the test section shall be re-laid & tested. No extra payment shall be made on this account of making test track or changes in grading or any other changes, if any. Full production shall not begin until acceptable test track has been constructed and accepted, in writing, by the Engineer-in-Charge.

3.1 Revision of Job Mix Formula

The Job Mix Formula shall be revised if there is change in source of material and/or if it is noticed by the Engineer-in-Charge that grading of Individual aggregates has changed. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site with new source of material/grading. No extra payment shall be made to the contractor on this account

3.2 Permissible Tolerances in the Job Mix Formula.

S.No.	Description	Permissible Variation
1	Aggregate passing 19mm sieve or larger	±7%
2	Aggregate passing 13.2mm, 9.5mm	±6%
3	Aggregate passing 4.75mm	±5%
4	Aggregate passing 2.36mm, 1.18mm, 0.6mm	±4%
5	Aggregate passing 0.3mm, 0.15 mm	±3%
6	Aggregate passing 0.075mm	±1.5%
7	Binder content	±0.3%

All the above tolerances are with respect to the Job Mix Formula as the datum.

4.0 Bitumen Content

The bitumen content of the mix shall be tested periodically and as directed by the Engineer-in-Charge using centrifugal extraction method or such method approved by the Engineer-in-Charge. The test shall generally be carried out in accordance with established practices and as directed by the Engineer-in-Charge. Whenever, there is a deviation in the resultant bitumen content from approved job-mix- formula values, it shall be reported to the Engineer-in-Charge immediately and necessary correction made at the job-mix plant as directed.

4.1 Cost adjustment for Bitumen

For the purpose of tendering, the Contractor may base his rate on the assumption that the bitumen content of the mixture shall be 135 Kg of bitumen per Cum. of total mix compacted to 100% density in Marshall mould. If the actual quantity of bitumen required to be used as a result of the JMF is found different from the quantity of bitumen that is assumed above, necessary adjustment in cost of extra/short bitumen used shall be made as per the rate worked out for bitumen under clause 10CA as mentioned in schedule or purchase price of bitumen at the nearest IOC/HP/Govt. refinery, whichever is lower. The

procurement price of bitumen (basic rate excluding GST) shall be ascertained by the Engineer-in-charge on submission of documentary proof by the contractor. The rate of bitumen decided by the Engineer-in-Charge shall be final and binding. Except adjustment in cost due to variation in bitumen consumption as stated above, no other factor for variation in consumption of bitumen, whatsoever shall be considered for adjustment in quoted rates

In the event of change in materials available at site due to unforeseen exigencies, a fresh job mix formula shall be arrived at within the specified limits in the AAI empanelled laboratory or Govt. Institute/laboratory as approved by the Engineer-in-Charge. Nothing extra is payable due to this.

Laboratory charges for the Job-mix formula design, costs of materials, its cartage and other incidental expenses shall be borne by the Contractor.

5.0 Mixing

All plants used by the contractor for the preparation of Dense Asphaltic Concrete should be equipped with the following:

a) Means for accurately weighing or measuring each batch of aggregates.
b) Bitumen tanks with arrangement of heating the material under effective and positive control at all times. In addition there should be satisfactory devices for weighing, metering of volumetric measurement of the bitumen to be used.
c) A mixer unit capable of producing uniform mixture.

The hot aggregate and binder shall be thoroughly and intimately mixed together in the correct proportion for at least 30 seconds or longer and until every particle of aggregates is completely coated and homogenous mixer is obtained. The total mixing time may be reduced but not less than 30 seconds in any case, if the Engineer-in-Charge is satisfied that through mixing can be achieved in less time. In such cases the contractor shall obtain prior written permission of the Engineer-in-charge.

6.0 Hot Mix Plant

The Hot Mix Plant (HMP) employed by the contractor shall be a weigh batch plant having a minimum capacity of:

a. For work cost	>Rs 500 Cr.	200 TPH
b. For work cost	>Rs 200 Cr. < Rs. 500 Cr.	160 TPH
c. For work cost	< Rs. 200 Cr.	120 TPH

Hot Mix Plant with electronic control of minimum capacity as above and capable of producing a proper quality mix shall be used for preparing the mix. The plant shall be batch type having a coordinative set of

essential units such as drier for heating the aggregate, devices for grading and batching/feeding by weight the required quantities of aggregates. The plant shall also have a binder heating and control unit for metering out the correct quantities of heated binder together with the mechanical mixer for thorough mixing of the binder and the aggregates. It should preferably have a separate feeder for incorporating the correct quantity of filler by weight.

Note: In case weigh batch mix plants are not feasible, permission to use continuous/drum type mix plant shall be taken from the concerned ED(Engg) while preparing TS.

7.0 Temperature

7.1 Following temperatures shall be adhered to at the different stages of work:

Bitumen Viscosity Grade	Bitumen Temperature °C	Aggregate Temperature °C	Mixed Material Temperature °C	Laying Temperature °C	*Rolling Temperature °C
VG-40	160-170	160-175	160-170	150 Min.	100 Min.
VG-30	150-165	150-170	150-165	140 Min.	90 Min.
VG-20	145-165	145-170	145-165	135 Min.	85 Min.
VG-10	140-160	140-165	140-160	130 Min.	80 Min.

*Rolling must be completed before the mat cools to these minimum temperatures.

At no time, shall the difference in temperature between the aggregates and the binder exceed 14^0C, at no time shall bitumen or aggregates be overheated.

8.0 Transportation of Hot Mix

The Hot Dense Asphaltic Concrete shall be transported from mixing plant to the site in clean vehicle. Every precaution shall be taken to avoid segregation of the hot mix and to ensure that they do not become contaminated with dust or foreign materials. In order to maintain satisfactory temperature of mix in transit, particularly in cold weather and to prevent undue loss of heat adequate precautions shall be taken by covering the material so that the materials are well protected during transportation. The temperature of the mix in every transporting vehicle shall be checked immediately prior to discharge of mix into the spreader and shall be ensured that the temperature is within the limits as specified in clause 7.0 above. If the temperature of mix in any transporting vehicle is not as per the limits specified in clause 7.0 above, the mix shall be rejected and shall be removed from site immediately.

9.0 Laying

Mix transported from the Hot Mix Plant to the site be spread by means of self-propelled electronic paver with electronic sensor & hydraulic control with suitable screeds capable of spreading, temping and finishing the mix true to the specified width and profile without calling segregation, dragging, bringing irregularities or other surface defects. The paver shall be capable of being operated at a speed consistent with a character of mix and the thickness of the course being laid so as to produce a surface of having uniform density and surface texture. The thickness of the single compacted layer shall not exceed 50mm. The temperature of the mix at the time of laying shall be as per clause 7.0 above.

10.0 Weather Limitation

The bituminous mixture shall not be placed:

i) in presence of standing water on the surface
ii) when the rain is imminent and during rains, fog or dust storm.
iii) When the binder course is damp.
iv) When the air temperature on the surface on which it is to be laid is below 10^0C.

11.0 Rolling

After the mix being spread, rolling shall be carried in three consecutive stages as below:

a) Break down rolling
b) Intermediate rolling
c) Finish rolling

11.1 The initial or Break down rolling shall be done with 8-10 tonne dead weight smooth wheeled roller. The intermediate rolling will be done with 8-10 static weight or vibratory roller or with a smooth wheel pneumatic tyred roller of 15 to 30 tonne capacity having tyre pressure 7 kg/cm2. The contractor shall demonstrate the efficiency of the equipment proposed to be used by carrying compaction trials. Finish rolling shall be done with 8 to 10 tonne steel wheel roller.

Alternatively, all the compaction operations i.e. break down rolling, intermediate rolling and finished rolling can be accomplished by using vibratory roller of 8 to 10 tonnes static weight. During the initial or breakdown rolling and finished rolling, the vibratory system shall be switched off. The joints and edges shall be rolled with 8 to 10 tonnes three wheeled static roller.

11.2 Bituminous mixes shall be rolled in the longitudinal direction, with the roller as close as possible to the paver. The overlap on successive passes

should be at least one-third of the width of the rear roll or in the case of pneumatic wheeled rollers, at least the nominal width of 300 mm.

11.3 Break-down rolling shall preferably commence as soon as practicable after the mix is spread. The maximum break down temperature at which rolling can commence shall be determined by field trials. The attempt should be to obtain the maximum possible density.

11.4 The principal function of finish rolling is to remove roller marks. The surface shall be carefully examined for residual marks which should be cleanly rolled out. A neat finished appearance shall be obtained. Finish rolling shall be accomplished with tandem roller.

11.5 Cold Rolling

The final compaction will be carried out with a pneumatic tyred roller of 15 to 30 tonne capacity having tyre pressure 7 kg/cm^2 after the entire paving operations are completed. This should be done on bright sunny days such that entire airfield is rolled minimum five times.

11.6 Speed of Rolling

The speed of rolling shall not exceed 4 - 5 km / hr to prevent adhesion of the mixture to the roller. The wheels shall be kept moist but excess of water shall not be permitted. The line of rolling shall not suddenly be changed, thereby displacing the mix. Roller shall not be left standing on the new surfacing.

11.7 Rolling Temperature

The range of temperature during rolling shall be as per clause 7.0 above.

12.0 Joints

12.1 Longitudinal Joints

Longitudinal joints and edges shall be constructed true to the delineating line parallel to the centre line of runway. The longitudinal lane joints shall be truly vertical in straight lines which shall be continuous for the full length of the pavement, or in smooth curves around bends. The exposed vertical edges of the longitudinal lane joints shall be carefully cut back and trimmed to firm material in the compacted lane, or for a minimum of one and a half times the layer thickness, whichever is the greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned and painted with hot bitumen immediately before laying of the adjacent lane. Nothing extra shall be paid on this account.

12.2 Transverse Joints

They shall be formed at right angles to the longitudinal joints and shall be truly vertical. The exposed vertical edges of the transverse joints shall be cut back and trimmed to firm material or for a distance of not less than 1-1/2 times the thickness of layer whichever is greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned. The exposed joints shall then be cleaned and painted with hot bitumen immediately before the laying of the lane continues. Nothing extra shall be paid on this account.

13.0 Pavement Edges

Pavement shall be laid to correct width and alignment. To achieve straight and vertical edge, Contractor shall either use adequate side shuttering or cut back the edges to correct width and alignment by removing extra mix spread. Nothing extra shall be paid on this account.

13.1 Temporary Ramps

Temporary ramps at the end of each day work shall be made to allow smooth movement of air traffic, as per direction of Engineer-in-charge. Nothing extra shall be paid on account of provision of ramps and nothing shall be deducted in case ramps are not required to be provided. The decision regarding provision of ramps or non-provision of ramps shall rest with the Engineer-in-charge.

14.0 Determination of Field Density

The density of finished paving layer shall be determined by taking cores, or by other approved method no sooner than 24 hour after laying. Methods like 'Nuclear Density Gauge' may be considered as supportive only with proper calibration and verification for the specific situation.

15.0 Quality Control Tests for Dense Asphaltic Concrete(DAC):

Apart from the quality control tests given in clause 1.1.1, following additional tests shall be carried out:

S.No.	Test	Test method	Frequency	Acceptance Criteria
1	Quality of binder	IS:73	Number of samples as per lot.	As per IS:73.
2	Deleterious materials	IS:2386 (Part-III)	As required by the Engineer- in- charge.	As required by engineer-in-charge
3	Mix grading	IS:2386 (Part-I)	One test for individual constituent and mixed aggregate from dryer for each 400 tonnes of mix subject to minimum of two tests per day per plant.	

4	Stability of mix, flow value, Density and void content.	ASTMD1559	3 tests for stability, flow value, density and void contents for each 400 tonnes of mix subject to minimum of two tests per day per plant.	
5	Binder content	As per 4.0 clause	One test for each 400 tonnes of mix subject to minimum of two tests per day per plant.	As per clause 3.2
6	Density of compacted layer	As per 14.0 clause	One test per 700m^2 area.	As per clause 16.1

Note: One test shall consists of 3 samples.

16.0 Acceptance Criteria

16.1 Field Density

The work shall be accepted as of quality, measured and paid in full if the field density does not work out to be less than 98% of the Design Laboratory Density worked out in Job Mix Formula in Clause 3.0 above.

When the field density achieved in the Field is between 95% and 98% of the Design Laboratory Density, the work shall be accepted as not up to the standard and paid at reduced rate on pro-rata basis of Design Laboratory Density with full rate for 98% density as base.

When the field density works out to be less than 95% of the Design Laboratory Density, the surface shall be further consolidated till the required field density is achieved. If this is not found possible, the work represented by the sample shall be dismantled and redone by the Contractor at his own cost.

16.2 Surface Accuracy

The finished surface of Dense Asphaltic Concrete shall be true to level, grade and camber as per the approved drawings and the directions of the Engineer-in-Charge. When a straight edge of 3 metres length is placed longitudinally or transversely, the maximum deviation shall not be more than 3 mm in longitudinal and transverse directions.

The surface accuracy shall be checked immediately after rolling. Surface irregularities which fall outside specified tolerance limits as stipulated in above para shall be rectified by removing to full depth the affected area which shall not be less than 10 Sqm and relaying with fresh materials. In no case shall depressions be filled up with screenings or binding material.

17.0 Measurements:

17.1 Before commencement of laying of Dense Asphaltic concrete, levels shall be taken jointly by the Engineer-in-Charge or his representative and the Contractor at 3 metre intervals both ways or closer as directed by the Engineer-in-Charge. These levels shall be recorded in the level book and plotted on the plan on plain computer sheet by the Contractor at his own cost and the same shall be signed by the Contractor. Proposed formation levels of the finished Dense Asphaltic Concrete surface shall be marked at corresponding points. Tack coat shall then be applied and Dense Asphaltic Concrete shall then be laid and compacted to required levels (Tack coat shall be paid separately in the respective item of BOQ). Levels of the compacted bituminous surface shall be taken at grid points at which levels were recorded earlier in the level book and also plotted on the plan. Level books as well as the plan shall be signed by the Contractor as token of acceptance of the levels.

17.2 The volume of compacted mix shall be worked out in cubic meter correct to two places of a decimal as the product of the measured surface area and average thickness laid. Average thickness shall be worked out on the basis of actual levels. The length and breadth shall be measured correct to cm.

17.3 In case DAC is to be laid on SDAC newly laid under this contract, the finished levels of previous surface shall be taken as initial levels for this purpose.

17.4 Quantity for payment shall be the theoretical quantity (Based on Proposed formation levels) or the actual quantity (based on actual finished levels) whichever is less.

18.0 Rate

The rate shall include the cost of all materials, plant machinery and labour required in all operations described above including all carriage and lifts involved. The rate also includes all cost of setting up the laboratory at site and carrying out the quality control measures/tests enumerated above by the Contractor at his own cost in the presence of Engineer-in-Charge or his authorised representative and submission of test results on completion of tests to the Engineer-in-Charge thereof (The item of Tack Coat shall be paid separately and is not included in this item).

********** **END OF ITEM NO. 10** **********

Item No.9: Providing and laying of Hot Mix **S**emi **D**ense **A**sphaltic **C**oncrete **(SDAC)** using crushed stone aggregate of quality, size and grading as specified and #filler as specified and Viscosity Grade Bitumen (supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade *(VG-10/VG-20/VG-30) content shall be taken as 120 kg/m^3 of mix supplied in bulk produced by Govt. Refineries and 2% hydrated lime by weight of aggregates as filler material].

* strike out whichever is not applicable.
# Filler in order of preference may be hydrated lime, stone dust or cement. The necessary cost adjustment shall be made based on JMF & availability of filler.

1.0 Materials

1.1 Coarse Aggregates

This shall consist of a crushed or broken from hard stone obtained from approved quarry. These shall be clean, strong, durable of fairly cubical shape and free from disintegrated, soft, friable, thin elongated or laminated pieces. This shall also be free from dirt, organic, deleterious material and any other foreign matter and adherent coatings. The grading of coarse aggregates shall conform to IS:383.

1.1.1 Physical Properties of Coarse Aggregate

The aggregate shall conform to the following Physical Properties:

Sl. No.	Property	Tests	Test Method	Frequency	Acceptance Criteria
1	Cleanliness	Grain Size Analysis	IS:2386 (Part.I)	Before approval of the quarry and at every subsequent change in the source of supply	Max. 5% passing 0.075mm sieve
2	Strength	Aggregate impact value	IS:2386 (Part.IV)	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	Max.24%
		Los Angeles Abrasion value	IS:2386 (Part IV)	-do-	Max.30%

3	Durability	Soundness (I) Loss with Sodium Sulphate for 5 cycles	IS:2386 (Part V)	One test for each source and whenever there is change in the quality of aggregate	Max. 12%
		(II) Loss with Magnesium Sulphate with5 cycles	-do-	-do-	Max. 18%
4	Particle Shape	Flakiness & Elongation Index (Combined)	IS:2386 (Part I)	One test per 350 Cum of aggregate for each source and whenever there is change in the quality of aggregate	Max. 30%
5	Stripping	Coating and Stripping of Bitumen Aggregate	IS:6241	One test for each source and whenever there is change in source of aggregate	Minimum Retained Coating 95%
6	Water absorption	Water absorption	IS:2386 Part III	-do-	Max.2%
7	Water Sensitivity	**Retained Tensile strength	AASHTO 283	One test for each mix type whenever there is change in quality or source of coarse or fine aggregate.	Minimum 80%
8	Presence of ferrous sulphide and iron oxide	As per clause 1.1.3	As per clause 1.1.3	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	No Presence of ferrous sulphide and iron oxide

** If the minimum retained tensile strength falls below 80%, use of anti-stripping agent is recommended to meet the minimum requirements.

Where anyone or some of the above conditions cannot be satisfied, it is left to the Engineer-in-Charge to allow reasonable tolerances, with the approval of ED(Engg).

1.1.2 Anti-stripping Agent: Anti-stripping agent or additive if required shall be heat stable, shall not change the viscosity of the binder beyond specifications, shall contain no harmful ingredients, shall be added in

recommended proportion by approved method and shall satisfy the requirements as stipulated in MORT&H Appendix-5. The cost of providing anti-stripping agent shall be borne by the contractor and nothing extra shall be paid on this account to the contractor.

1.1.3 Some aggregates may contain ferrous sulfides and iron oxides which can cause stains on exposed concrete surfaces. In areas where staining has been a problem or is suspected, the Engineer should verify that producers and aggregate suppliers have taken steps to prevent the inclusion of any ferrous sulfides or iron oxides in aggregate to be used in the project.

If there is a concern that these may exist, an indicator to identify staining particles is to immerse the aggregate in a lime slurry. If staining particles are present, a blue-green gelatinous precipitate will form within five (5) to 10 minutes, rapidly changing to a brown color on exposure to air and light. The reaction should be complete in 30 minutes. If no brown gelatinous precipitate forms, there is little chance of reaction in concrete.

1.2 Fine Aggregates

Fine aggregate shall consist of crushed or naturally occurring mineral material or combination of two, passing 2.36mm sieve and retained on 0.075mm sieve. No natural sand shall be allowed. The fine aggregate shall be clean, hard, durable, dry, and free from dust and soft organic and other deleterious substances. Fine aggregates shall have sand equivalent value not less than 50 when tested in accordance with the requirement of IS:2720 Part 37. The Plasticity Index of fraction of passing the 0.425mm sieve shall not exceed 4 when tested in accordance with IS:2720 Part 5.

1.3 Filler

Filler shall consist of finely divided mineral matter such as hydrated lime or stone dust or cement of quality conforming to relevant IS code as approved by the Engineer-in-charge. The use of hydrated lime is encouraged because of its very good anti-stripping and antioxidant properties. Stone dust or Cement may be used if hydrated lime is not available.

Grading Requirement of Mineral Filler

IS Sieve (mm)	Cumulative % passing by weight of total aggregate
0.6	100
0.3	95 - 100
0.075	85 - 100

The filler shall be inert material free from organic impurities and shall have Plasticity Index not greater than 4. PI requirement will not apply if filler is hydrated lime or cement.

1.3.1 Cost Adjustment for Filler

For the purpose of tendering the contractor may base his rate assuming 2% hydrated lime as filler by weight of aggregates. If the actual quantity & type of filler required to be used as per mix design is found to be different from the quantity & type of filler assumed above, necessary adjustment in cost of extra/short filler shall be made as per the rate of filler used in actual supply voucher from manufacturer/ authorized dealer at the time of execution. In the case of authorized distributor the rate may be authenticated by the manufacturer. In the case of stone dust, the rate as per actual supply voucher shall be used. The rate of filler exclusive of GST shall only be considered for payment.

1.4 Bitumen

The bitumen shall be, Viscosity Grade Bitumen conforming to IS:73, supplied in bulk by Govt. refineries in India. However, in region where bulk bitumen is not available, then packed bitumen may be specified in the tender document. Selection of VG grade bitumen shall be based upon the climatic conditions of the area as per Table-1 below:

Table-1

Lowest Daily Mean Air Temperature	Highest Daily Mean Air Temperature		
	Less than 20^0C	20 to 30^0C	More than 30^0C
More than -10^0C	VG-10	VG-20	VG-30
-10^0C or Lower	VG-10	VG-10	VG-20

The contractor shall mandatorily provide weigh bridge at the hot mix plant for accurate weighing of materials.

Use of imported Bitumen shall not be allowed. The agencies shall submit copies of the purchase vouchers of the bitumen to the Engineer-in-Charge.

2.0 Combined Grading of Aggregates

In order to satisfy the design requirements for the Semi Dense Asphaltic Concrete (SDAC) as laid down in para 3.0, the mix shall contain coarse aggregates , fine aggregates in suitable proportions. True and representative samples of the aggregates proposed to be used on specific job shall be tested in material testing lab (approved by AAI/Govt. institutions i.e. IITs, NITs, Govt. Engg. College etc.) and proper blend of individual aggregates normally available shall be worked out so that the gradation of the final composition shall satisfy the limits laid down below:

Nominal maximumsize of aggregate	**19mm**
Layer thickness	**50-75mm**

IS Sieve (mm)	Percentage by weight passing
26.5	100
19	90-100
13.2	59-79
9.5	52-72
4.75	35-55
2.36	28-44
1.18	20-34
0.6	15-27
0.3	10-20
0.15	5-13
0.075	2-8

3.0 Job Mix Formula (JMF)

Twenty days prior to the start of work at site, the job mix formula shall be got determined by the contractor in AAI empanelled or Govt. Institute/laboratory or in-house by Department of Structure, as directed by the Engineer-in-Charge, by Marshall Design Method. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site. The Contractor also shall intimate, in writing, to the Engineer-in-Charge the details of source and location of all materials, their sizes, grading and test results. Besides conforming to the requirements of grading and quality for individual ingredients, the mix shall meet the requirements enumerated below:

S.No.	Criteria	Value
1	No. of compaction blows on each side of Marshall specimen	75
2	Marshall stability in kN at 60^0C	Not less than 9.0
3	Marshall flow value in mm for VG Bitumen	2-4
4	Marshall Quotient for Viscosity grade Paving Bitumen(Ratio of Stability/Flow)	2-5
5	Percentage Voids in Mix (VIM)	3-5
6	Percentage voids in mineral aggregates filled with bitumen (VFB)	65-75%
7	Bitumen(Viscosity Grade) content by weight of mix	As determined in the Lab.
8	Design laboratory density (Bulk density of the Marshall mould)	As determined in the Lab.
9	Retained Marshall Stability on Immersion Test	Not less than 75%
10	Tensile Strength Ratio (TSR) – Refer Annexure-I for the outline of AASHTO T 283.	Not less than 80%
11	Voids in mineral aggregates(VMA)	As per table below

Table showing Min VMA values

Nominal Maximum Particle size (mm)*	Min VMA related to designated % air voids**		
	3%	4%	5%
9.5	14	15	16
13.2	13	14	15
19	12	13	14
26.5	11	12	13

* The nominal maximum particle size is one size larger than the first sieve, which retains more than 10% material.

** For intermediate value of designated percentage air voids interpolate the VMA.

Note: Design of mix should also meet the following criteria:

a) A test track of minimum 7m wide and 90m length and shall be of the same depth specified for the construction of the course which it represents, laid and tested by the contractor before commencement of actual work. The core cut from the test track on testing shall give a stability and density of not less than 98% of the respective design values.

In case of any deficiency, necessary adjustment in Job Mix formula, Plant operation, Placing procedures and /or rolling procedure shall be made and the test section shall be re-laid & tested. No extra payment shall be made on this account of making test track or changes in grading or any other changes, if any. Full production shall not begin until acceptable test track has been constructed and accepted, in writing, by the Engineer-in-Charge

3.1 Revision of Job Mix Formula

The Job Mix Formula shall be revised if there is change in source of material and/or if it is noticed by the Engineer-in-Charge that grading of Individual aggregates has changed. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site with new source of material/grading. No extra payment shall be made to the contractor on this account.

3.2 Permissible Tolerances in the Job Mix Formula.

S.No.	Description	Permissible Variation
1	Aggregate passing 19mm sieve or larger	±7%
2	Aggregate passing 13.2mm, 9.5mm	±6%
3	Aggregate passing 4.75mm	±5%

4	Aggregate passing 2.36mm, 1.18mm, 0.6mm	±4%
5	Aggregate passing 0.3mm, 0.15 mm	±3%
6	Aggregate passing 0.075mm	±1.5%
7	Binder content	±0.3%

All the above tolerances are with respect to the Job Mix Formula as the datum.

4.0 Bitumen Content

The bitumen content of the mix shall be tested periodically and as directed by the Engineer-in-Charge using centrifugal extraction method or such method approved by the Engineer-in-Charge. The test shall generally be carried out in accordance with established practices and as directed by the Engineer-in-Charge. Whenever, there is a deviation in the resultant bitumen content from approved job-mix- formula values, it shall be reported to the Engineer-in-Charge immediately and necessary correction made at the job-mix plant as directed.

4.1 Cost adjustment for Bitumen

For the purpose of tendering, the Contractor may base his rate on the assumption that the bitumen content of the mixture shall be 120 Kg of bitumen per Cum. of total mix compacted to 100% density in Marshall mould. If the actual quantity of bitumen required to be used as a result of the JMF is found different from the quantity of bitumen that is assumed above, necessary adjustment in cost of extra/short bitumen used shall be made as per the rate worked out for bitumen under clause 10 CA as mentioned in schedule or purchase price of bitumen at the nearest IOC/HP/Govt. refinery, whichever is lower. The procurement price of bitumen (basic rate excluding GST) shall be ascertained by the Engineer-in-charge on submission of documentary proof by the contractor. The rate of bitumen decided by the Engineer-in-Charge shall be final and binding. Except adjustment in cost due to variation in bitumen consumption as stated above, no other factor for variation in consumption of bitumen, whatsoever shall be considered for adjustment in quoted rates.

In the event of change in materials available at site due to unforeseen exigencies, a fresh job mix formula shall be arrived at within the specified limits in the laboratory as approved by the Engineer-in-Charge. Nothing extra is payable due to this.

Laboratory charges for the Job-mix formula design, costs of materials, its cartage and other incidental expenses shall be borne by the Contractor.

5.0 Mixing

All plants used by the contractor for the preparation of Semi Dense Asphaltic Concrete should be equipped with the following:

a) Means for accurately weighing or measuring each batch of aggregates.
b) Bitumen tanks with arrangement of heating the material under effective and positive control at all times. In addition there should be satisfactory devices for weighing, metering of volumetric measurement of the bitumen to be used.
c) A mixer unit capable of producing uniform mixture.

The hot aggregate and binder shall be thoroughly and intimately mixed together in the correct proportion for at least 30 seconds or longer and until every particle of aggregates is completely quoted and homogenous mixer is obtained. The total mixing time may be reduced but not less than 30 seconds in any case, if the Engineer-in-Charge is satisfied that through mixing can be achieved in less time. In such cases the contractor shall obtain prior written permission of the Engineer-in-charge.

6.0 Hot Mix Plant

The Hot Mix Plant (HMP) employed by the contractor shall be a weigh batch plant having a minimum capacity of:

a. For work cost	>Rs 500 Cr.	200 TPH
b. For work cost	>Rs 200 Cr. < Rs. 500 Cr.	160 TPH
c. For work cost	< Rs. 200 Cr.	120 TPH

Hot Mix Plant with electronic control of minimum capacity as above and capable of producing a proper quality mix shall be used for preparing the mix. The plant shall be batch type having a coordinative set of essential units such as drier for heating the aggregate, devices for grading and batching/feeding by weight the required quantities of aggregates. The plant shall also have a binder heating and control unit for metering out the correct quantities of heated binder together with the mechanical mixer for thorough mixing of the binder and the aggregates. It should preferably have a separate feeder for incorporating the correct quantity of filler by weight.

Note: In case weigh batch mix plants are not feasible, permission to use continuous/drum type mix plant shall be taken from the concerned ED(Engg) while preparing TS.

7.0 Temperature

7.1 Following temperatures shall be adhered to for VG bitumen at the different stages of work:

Bitumen Viscosity Grade	Bitumen Temperature °C	Aggregate Temperature °C	Mixed Material Temperature °C	Laying Temperature °C	*Rolling Temperature °C
VG-40	160-170	160-175	160-170	150 Min.	100 Min.
VG-30	150-165	150-170	150-165	140 Min.	90 Min.
VG-20	145-165	145-170	145-165	135 Min.	85 Min.
VG-10	140-160	140-165	140-160	130 Min.	80 Min.

*Rolling must be completed before the mat cools to these minimum temperatures.

At no time, shall the difference in temperature between the aggregates and the binder exceed 14^0C, at no time shall bitumen or aggregates be overheated.

8.0 Transportation of Hot Mix

The Hot Semi Dense Asphaltic Concrete shall be transported from mixing plant to the site in clean vehicle. Every precaution shall be taken to avoid segregation of the hot mix and to ensure that they do not become contaminated with dust or foreign materials. In order to maintain satisfactory temperature of mix in transit, particularly in cold weather and to prevent undue loss of heat adequate precautions shall be taken by covering the material so that the materials are well protected during transportation. The temperature of the mix in every transporting vehicle shall be checked immediately prior to discharge of mix into the spreader and shall be ensured that the temperature is within the limits as specified in clause 7.0 above. If the temperature of mix in any transporting vehicle is not as per the limits specified in clause 7.0 above, the mix shall be rejected and shall be removed from site immediately.

9.0 Laying

Mix transported from the Hot Mix Plant to the site be spread by means of self-propelled electronic paver with electronic sensor & hydraulic control with suitable screeds capable of spreading, temping and finishing the mix true to the specified width and profile without calling segregation, dragging, bringing irregularities or other surface defects. The paver shall be capable of being operated at a speed consistent with a character of mix and the thickness of the course being laid so as to produce a surface of having uniform density and surface texture. The thickness of the single compacted layer shall not exceed 75mm. The temperature of the mix at the time of laying shall be as per clause 7.0 above.

10.0 Weather Limitation

The bituminous mixture shall not be placed:

i) in presence of standing water on the surface
ii) when the rain is imminent and during rains, fog or dust storm.
iii) When the base course is damp.
iv) When the air temperature on the surface on which it is to be laid is below 10^0C for mix with VG bitumen as binder.

11.0 Rolling

After the mix being spread, rolling shall be carried in three consecutive stages as below:

a) Break down rolling
b) Intermediate rolling
c) Finish rolling

11.1 The initial or Break down rolling shall be done with 8-10 tonne dead weight smooth wheeled roller. The intermediate rolling will be done with 8-10 static weight or vibratory roller or with a smooth wheel pneumatic tyred roller of 15 to 30 tonne capacity having tyre pressure 7 kg/cm2. The contractor shall demonstrate the efficiency of the equipment proposed to be used by carrying compaction trials. Finish rolling shall be done with 8 to 10 tonne steel wheel roller.

Alternatively all the compaction operations i.e. break down rolling, intermediate rolling and finished rolling can be accomplished by using vibratory roller of 8 to 10 tonnes static weight. During the initial or breakdown rolling and finished rolling, the vibratory system shall be switched off. The joints and edges shall be rolled with 8 to 10 tonnes three wheeled static roller.

11.2 Bituminous mixes shall be rolled in the longitudinal direction, with the roller as close as possible to the paver. The overlap on successive passes should be at leas tone-third of the width of the rear roll or in the case of pneumatic wheeled rollers, at least the nominal width of 300 mm.

11.3 Break-down rolling shall preferably commence as soon as practicable after the mix is spread. The maximum break down temperature at which rolling can commence shall be determined by field trials. The attempt should be to obtain the maximum possible density.

11.4 The principal function of finish rolling is to remove roller marks. The surface shall be carefully examined for residual marks which should be cleanly rolled out. A neat finished appearance shall be obtained.

11.5 Speed Of Rolling

The speed of rolling shall not exceed 4 - 5 km / hr to prevent adhesion of the mixture to the roller. The wheels shall be kept moist but excess

of water shall not be permitted. The line of rolling shall not suddenly be changed, thereby displacing the mix. Roller shall not be left standing on the new surfacing.

11.6 Rolling Temperature

The range of temperature during rolling shall be as per clause 7.0 above.

12.0 Joints

12.1 Longitudinal Joints

Longitudinal joints and edges shall be constructed true to the delineating line parallel to the centre line of runway. The longitudinal lane joints shall be truly vertical in straight lines which shall be continuous for the full length of the pavement, or in smooth curves around bends. The exposed vertical edges of the longitudinal lane joints shall be carefully cut back and trimmed to firm material in the compacted lane, or for a minimum of one and a half times the layer thickness, whichever is the greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned and painted with hot bitumen immediately before laying of the adjacent lane. Nothing extra shall be paid on this account.

12.2 Transverse Joints

They shall be formed at right angles to the longitudinal joints, and shall be truly vertical. The exposed vertical edges of the transverse joints shall be cut back and trimmed to firm material or for a distance of not less than 1-1/2 times the thickness of layer whichever is greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned. The exposed joints shall then be cleaned and painted with hot bitumen immediately before the laying of the lane continues. Nothing extra shall be paid on this account.

13.0 Pavement Edges

Pavement shall be laid to correct width and alignment. To achieve straight and vertical edge, Contractor shall either use adequate side shuttering or cut back the edges to correct width and alignment by removing extra mix spread. Nothing extra shall be paid on this account.

13.1 Temporary Ramps

Temporary ramps at the end of each day work shall be made to allow smooth movement of air traffic, as per direction of Engineer-in-charge. Nothing extra shall be paid on account of provision of ramps and nothing shall be deducted in case ramps are not required to be

provided. The decision regarding provision of ramps or non-provision of ramps shall rest with the Engineer-in-charge.

14.0 Determination of Field Density

The density of finished paving layer shall be determined by taking cores, or by other approved method no sooner than 24 hour after laying. Methods like 'Nuclear Density Gauge' may be considered assupportive only with proper calibration and verification for the specific situation.

15.0 Quality Control Tests for Semi Dense Asphaltic Concrete (SDAC):

Apart from the quality control tests given in clause 1.1.1, following additional tests shall be carried out:

S.No.	Test	Test method	Frequency	Acceptance Criteria
1	Quality of binder	IS:73	Number of samples as per lot.	As per IS:73
2	Deleterious materials	IS:2386 (Part-III)	As required by the Engineer- in- charge.	As required by engineer-in-charge
3	Mix grading	IS:2386 (Part-I)	One test for individual constituent and mixed aggregate from dryer for each 400 tonnes of mix subject to minimum of two tests per day per plant.	
4	Stability of mix ,flow value, density and void content.	ASTMD1559	3 tests for stability, flow value, density and void contents for each 400 tonnes of mix subject to minimum of two tests per day per plant.	
5	Binder content	As per clause 4.0	One test for each 400 tonnes of mix subject to minimum of two tests per day per plant.	As per clause 3.2
6	Density of compacted layer	As per clause 14.0	One test per 700m^2 area.	As per clause 16.1

Note: One test shall consists of 3 samples.

16.0 Acceptance Criteria

16.1 Field Density

The work shall be accepted as of quality, measured and paid in full if the field density does not work out to be less than 98% of the Design Laboratory Density worked out in Job Mix Formula in Clause 3.0 above.

When the field density achieved in the Field is between 95% and 98% of the Design Laboratory Density, the work shall be accepted as not up to the standard and paid at reduced rate on pro-rata basis of Design Laboratory Density with full rate for 98% density as base.

When the field density works out to be less than 95% of the Design Laboratory Density, the surface shall be further consolidated till the required field density is achieved. If this is not found possible, the work represented by the sample shall be dismantled and redone by the Contractor at his own cost.

16.2 Surface Accuracy

The finished surface of Semi Dense Asphaltic Concrete shall be true to level, grade and camber as per the approved drawings and the directions of the Engineer-in-Charge. When a straight edge of 3 metres length is placed longitudinally or transversely, the maximum deviation shall not be more than 3 mm in longitudinal and transverse directions.

The surface accuracy shall be checked immediately after rolling. Surface irregularities which fall outside specified tolerance limits as stipulated in above para shall be rectified by removing to full depth the affected area which shall not be less than 10 Sqm and relaying with fresh materials. In no case shall depressions be filled up with screenings or binding material.

17.0 Measurements:

17.1 Before commencement of laying of Semi Dense Asphaltic concrete, levels shall be taken jointly by the Engineer-in-Charge or his representative and the Contractor at 3 metre intervals both ways or closer as directed by the Engineer-in-Charge. These levels shall be recorded in the level book and plotted on the plan on plain computer sheet by the Contractor at his own cost and the same shall be signed by the Contractor. Proposed formation levels of the finished Semi Dense Asphaltic Concrete surface shall be marked at corresponding points. Tack coat shall then be applied and Semi Dense Asphaltic Concrete shall then be laid and compacted to required levels (Tack coat shall be paid separately in the respective item of BOQ). Levels of the compacted bituminous surface shall be taken at grid points at which levels were recorded earlier in the level book and also plotted on the plan. Level books as well as the plan shall be signed by the Contractor as token of acceptance of the levels.

17.2 The volume of compacted mix shall be worked out in cubic meter correct to two places of a decimal as the product of the measured surface area and average thickness laid. Average thickness shall be worked out on the basis of actual levels. The length and breadth shall be measured correct to cm.

17.3 In case SDAC is to be laid on Dense Bituminous Macadam (DBM) newly laid under this contract, the finished levels of previous surface shall be taken as initial levels for this purpose.

17.4 Quantity for payment shall be the theoretical quantity (Based on Proposed formation levels) or the actual quantity (based on actual finished levels) whichever is less.

18.0 Rate

The rate shall include the cost of all materials, plant machinery and labour required in all operations described above including all carriage and lifts involved. The rate also includes all cost of setting up the laboratory at site and carrying out the quality control measures/tests enumerated above by the Contractor at his own cost in the presence of Engineer-in-Charge or his authorised representative and submission of test results on completion of tests to the Engineer-in-Charge thereof (The item of Tack Coat shall be paid separately and is not included in this item).

********** **END OF ITEM NO. 9** **********

Item No.7: Providing and laying of Hot Mix **D**ense **B**ituminous **M**acadam **(DBM)** using crushed stone aggregate of quality, size and grading as specified and #filler as specified and Viscosity Grade Bitumen (supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade *(VG-10/VG-20/VG-30) shall be taken as 110 kg/m^3 of mix supplied in bulk produced by Govt. Refineries and 2% hydrated lime by weight of aggregates as filler material].

* strike out whichever is not applicable.
# Filler in order of preference may be hydrated lime, stone dust or cement. The necessary cost adjustment shall be made based on JMF & availability of filler.

1.0 Materials

1.1 Coarse Aggregates

This shall consist of a crushed or broken from hard stone obtained from approved quarry. These shall be clean, strong, durable of fairly cubical shape and free from disintegrated, soft, friable, thin elongated or laminated pieces. This shall also be free from dirt, organic, deleterious material and any other foreign matter and adherent coatings. The grading of coarse aggregates shall conform to IS:383.

1.1.1 Physical Properties of Coarse Aggregate

The aggregate shall conform to the following Physical Properties:

Sl. No.	Property	Tests	Test Method	Frequency	Acceptance Criteria
1	Cleanliness	Grain Size Analysis	IS:2386 (Part.I)	Before approval of the quarry and at every subsequent change in the source of supply	Maximum 5% passing 0.075mm sieve
2	Strength	Aggregate impact value	IS:2386 (Part.IV)	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	Max. 27%

		Los Angeles Abrasion value	IS:2386 (Part IV)	-do-	Max. 35%
3	Durability	Soundness (I) Loss with Sodium Sulphate for 5 cycles	IS:2386 (Part V)	One test for each source and whenever there is change in the quality of aggregate	Max. 12%
		(II) Loss with Magnesium Sulphate with5 cycles	-do-	-do-	Max. 18%
4	Particle Shape	Flakiness & Elongation Index (Combined)	IS:2386 (Part I)	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	Max. 35%
5	Stripping	Coating and Stripping of Bitumen Aggregate	IS:6241	One test for each source and whenever there is change in source of aggregate	Minimum Retained Coating 95%
6	Water absorption	Water absorption	IS:2386 Part III	-do-	Max. 2%
7	Water Sensitivity	**Retained Tensile strength	AASHTO 283	One test for each mix type whenever there is change in quality or source of coarse or fine aggregate.	Minimum 80%
8	Presence of ferrous sulphide and iron oxide	As per clause 1.1.3.	As per clause 1.1.3.	One test per 350cum of aggregate for each source and whenever there is change in quality of aggregate	No Presence of ferrous sulphide and iron oxide

** If the minimum retained tensile strength falls below 80%, use of anti-stripping agent is recommended to meet the minimum requirements.

Where anyone or some of the above conditions cannot be satisfied, it is left to the Engineer-in-Charge to allow reasonable tolerances, with the approval of ED(Engg).

1.1.2 Anti-stripping Agent: Anti-stripping agent or additive if required shall be heat stable, shall not change the viscosity of the binder beyond specifications, shall contain no harmful ingredients, shall be added in recommended proportion by approved method and shall satisfy the requirements as stipulated in MORT&H Appendix-5. The cost of providing anti-stripping agent shall be borne by the contractor and nothing extra shall be paid on this account to the contractor.

1.1.3 Some aggregates may contain ferrous sulfides and iron oxides which can cause stains on exposed concrete surfaces. In areas where staining has been a problem or is suspected, the Engineer should verify that producers and aggregate suppliers have taken steps to prevent the inclusion of any ferrous sulfides or iron oxides in aggregate to be used in the project.

If there is a concern that these may exist, an indicator to identify staining particles is to immerse the aggregate in a lime slurry. If staining particles are present, a blue-green gelatinous precipitate will form within five (5) to 10 minutes, rapidly changing to a brown color on exposure to air and light. The reaction should be complete in 30 minutes. If no brown gelatinous precipitate forms, there is little chance of reaction in concrete.

1.2 Fine Aggregates

Fine aggregate shall consist of crushed or naturally occurring mineral material or combination of two passing 2.36mm sieve and retained on 0.075mm sieve. Not more than 10% natural sand shall be allowed. The fine aggregate will be clean, hard, durable, dry, and free from dust and soft organic and other deleterious substances. Fine aggregates shall have sand equivalent value not less than 50 when tested in accordance with the requirement of IS:2720 Part 37. The Plasticity Index of fraction of passing the 0.425mm sieve shall not exceed 4 when tested in accordance with IS:2720 Part 5.

1.3 Filler

Filler shall consist of finely divided mineral matter such as hydrated lime or stone dust or cement of quality conforming to relevant IS code as approved by the Engineer-in-charge. The use of hydrated lime is encouraged because of its very good anti-stripping and antioxidant properties. Stone dust or Cement may be used if hydrated lime is not available.

Grading Requirement of Mineral Filler

IS Sieve (mm)	Cumulative % passing by weight of total aggregate
0.6	100
0.3	95 - 100

0.075	85 - 100

The filler shall be inert material free from organic impurities and shall have Plasticity Index not greater than 4. PI requirement will not apply if filler is hydrated lime or cement.

1.3.1 Cost Adjustment for Filler

For the purpose of tendering the contractor may base his rate assuming 2% hydrated lime as filler by weight of aggregates. If the actual quantity & type of filler required to be used as per mix design is found to be different from the quantity & type of filler assumed above, necessary adjustment in cost of extra/short filler shall be made as per the rate of filler used in actual supply voucher from manufacturer/ authorized dealer at the time of execution. In the case of authorized distributor the rate may be authenticated by the manufacturer. In the case of stone dust, the rate as per actual supply voucher shall be used. The rate of filler exclusive of GST shall only be considered for payment.

1.4 Bitumen

The bitumen shall be, Viscosity Grade Bitumen conforming to IS:73, supplied in bulk by Govt. refineries in India. However, in region where bulk bitumen is not available, then packed bitumen may be specified in the tender document. Selection of VG grade bitumen shall be based upon the climatic conditions of the area as per Table-1 below:

Table-1

Lowest Daily Mean Air Temperature	Highest Daily Mean Air Temperature		
	Less than 20^0C	20 to 30^0C	More than 30^0C
More than -10^0C	VG-10	VG-20	VG-30
-10^0C or Lower	VG-10	VG-10	VG-20

The contractor shall mandatorily provide weigh bridge at the hot mix plant for accurate weighing of materials.

Use of imported Bitumen shall not be allowed. The agencies shall submit copies of the purchase vouchers of the bitumen to the Engineer-in-Charge.

2.0 Combined Grading of Aggregates

In order to satisfy the design requirements for the Dense Bituminous Macadam (DBM) as laid down in para 3.0, the mix shall contain coarse aggregates, fine aggregates in suitable proportions. True and representative samples of the aggregates proposed to be used on specific job shall be tested in material testing lab (approved by AAI/Govt. institutions i.e. IITs, NITs, Govt. Engg. College etc.) and proper blend of individual aggregates normally available shall be

worked out so that the gradation of the final composition shall satisfy the limits laid down below:

Grading	**2**
Nominal maximum Aggregate size	**26.5 mm**
Layer Thickness	**50-75 mm**
IS Sieve Size (MM)	**Cumulative percentage by weight of percentage passing**
37.5	100
26.5	90-100
19	71-95
13.2	56-80
4.75	38-54
2.36	28-42
0.3	7-21
0.075	2-8

3.0 Job Mix Formula (JMF)

Twenty days prior to the start of work at site, the job mix formula shall be got determined by the contractor in AAI empanelled or Govt. Institute/laboratory or in-house by Department of Structure, as directed by the Engineer-in-Charge, by Marshall Design Method. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site. The Contractor also shall intimate, in writing, to the Engineer-in-Charge the details of source and location of all materials, their sizes, grading and test results. Besides conforming to the requirements of grading and quality for individual ingredients, the mix shall meet the requirements enumerated below:

S.No	**Criteria**	**Value**
1	No. of compaction blows on each side of Marshall specimen.	75
2	Marshall stability in kN at 60^0C	Not less than 9.0
3	Marshall flow value in mm for VG Bitumen	2-4
4	Marshall Quotient for Viscosity grade Paving Bitumen(Ratio of Stability/Flow)	2-5
5	Percentage air Voids in Mix (VIM)	3-5
6	Percentage voids in mineral aggregates filled with bitumen (VFB)	65-75
7	Bitumen(Viscosity Grade) content by weight of mix	As determined in the Lab.
8	Design laboratory density (Bulk density of the Marshall mould)	As determined in the Lab.
9	Retained Marshall Stability on Immersion Test	Not less than 75%

10	Tensile strength Ratio (TSR) – Refer Annexure –I for outline of AASHTO 283)	Not less than 80%
11	Voids in mineral aggregates(VMA)	As per table below

Table showing Min VMA values

Nominal Maximum Particle size (mm)*	Min VMA related to designated % air voids**		
	3%	4%	5%
9.5	14	15	16
13.2	13	14	15
19	12	13	14
26.5	11	12	13

* The nominal maximum particle size is one size larger than the first sieve, which retains more than 10% material.

** For intermediate value of designated percentage air voids interpolate the VMA.

Note: Design of mix should also meet the following criteria:

a) A test track of minimum 7m wide and 90m length and shall be of the same depth specified for the construction of the course which it represents, laid and tested by the contractor before commencement of actual work. The core cut from the test track on testing shall give a stability and density of not less than 98% of the respective design values.

In case of any deficiency, necessary adjustment in Job Mix formula, Plant operation, Placing procedures and /or rolling procedure shall be made and the test section shall be re-laid & tested. No extra payment shall be made on this account of making test track or changes in grading or any other changes, if any. Full production shall not begin until acceptable test track has been constructed and accepted, in writing, by the Engineer-in-Charge.

3.1 Revision of Job Mix Formula

The Job Mix Formula shall be revised if there is change in source of material and/or if it is noticed by the Engineer-in-Charge that grading of Individual aggregates has changed. The Job Mix Formula (JMF) so determined shall be submitted by the contractor, in writing, to the engineer–in-charge for his acceptance before the actual paving work starts at site with new source of material/grading. No extra payment shall be made to the contractor on this account.

3.2 Permissible Tolerances in the Job Mix Formula.

S.No.	Description	Permissible Variation

1	Aggregate passing 19mm sieve or larger	±8%
2	Aggregate passing 13.2mm, 9.5mm	±7%
3	Aggregate passing 4.75mm	±6%
4	Aggregate passing 2.36mm, 1.18mm, 0.6mm	±5%
5	Aggregate passing 0.3mm, 0.15 mm	±4%
6	Aggregate passing 0.075mm	±2%
7	Binder content	±0.3%

All the above tolerances are with respect to the Job Mix Formula as the datum.

4.0 Bitumen Content

The bitumen content of the mix shall be tested periodically and as directed by the Engineer-in-Charge using centrifugal extraction method or such method approved by the Engineer-in-Charge. The test shall generally be carried out in accordance with established practices and as directed by the Engineer-in-Charge. Whenever, there is a deviation in the resultant bitumen content from approved job-mix- formula values, it shall be reported to the Engineer-in-Charge immediately and necessary correction made at the job-mix plant as directed.

4.1 Cost adjustment for Bitumen

For the purpose of tendering, the Contractor may base his rate on the assumption that the bitumen content of the mixture shall be 110 Kg of bitumen per Cum. of total mix compacted to 100% density in Marshall mould. If the actual quantity of bitumen required to be used as a result of the JMF is found different from the quantity of bitumen that is assumed above, necessary adjustment in cost of extra/short bitumen used shall be made as per the rate worked out for bitumen under clause 10 CA as mentioned in schedule or purchase price of bitumen at the nearest IOC/HP/Govt. refinery, whichever is lower. The procurement price of bitumen (basic rate excluding GST) shall be ascertained by the Engineer-in-charge on submission of documentary proof by the contractor. The rate of bitumen decided by the Engineer-in-Charge shall be final and binding. Except adjustment in cost due to variation in bitumen consumption as stated above, no other factor for variation in consumption of bitumen, whatsoever shall be considered for adjustment in quoted rates.

In the event of change in materials available at site due to unforeseen exigencies, a fresh job mix formula shall be arrived at within the specified limits in the laboratory as approved by the Engineer-in-Charge. Nothing extra is payable due to this.

Laboratory charges for the Job-mix formula design, costs of materials, its cartage and other incidental expenses shall be borne by the Contractor.

5.0 Mixing

All plants used by the contractor for the preparation of Dense Bituminous Macadam should be equipped with the following:

a) Means for accurately weighing or measuring each batch of aggregates.
b) Bitumen tanks with arrangement of heating the material under effective and positive control at all times. In addition there should be satisfactory devices for weighing, metering of volumetric measurement of the bitumen to be used.
c) A mixer unit capable of producing uniform mixture.

The hot aggregate and binder shall be thoroughly and intimately mixed together in the correct proportion for at least 30 seconds or longer and until every particle of aggregates is completely quoted and homogenous mixer is obtained. The total mixing time may be reduced but not less than 30 seconds in any case, if the Engineer-in-Charge is satisfied that through mixing can be achieved in less time. In such cases the contractor shall obtain prior written permission of the Engineer-in-charge.

6.0 Hot Mix Plant

The Hot Mix Plant (HMP) employed by the contractor shall be a weigh batch plant having a minimum capacity of:

a. For work cost	>Rs 500 Cr.	200 TPH
b. For work cost	>Rs 200 Cr. < Rs. 500 Cr.	160 TPH
c. For work cost	< Rs. 200 Cr.	120 TPH

Hot Mix Plant with electronic control of minimum capacity as above and capable of producing a proper quality mix shall be used for preparing the mix. The plant shall be batch type having a coordinative set of essential units such as drier for heating the aggregate, devices for grading and batching/feeding by weight the required quantities of aggregates. The plant shall also have a binder heating and control unit for metering out the correct quantities of heated binder together with the mechanical mixer for thorough mixing of the binder and the aggregates. It should preferably have a separate feeder for incorporating the correct quantity of filler by weight.

Note: In case weigh batch mix plants are not feasible, permission to use continuous/drum type mix plant shall be taken from the concerned ED(Engg) while preparing TS.

7.0 Temperature

7.1 Following temperatures shall be adhered to for VG bitumen at the different stages of work:

Bitumen Viscosity Grade	Bitumen Temperature °C	Aggregate Temperature °C	Mixed Material Temperature °C	Laying Temperature °C	*Rolling Temperature °C
VG-40	160-170	160-175	160-170	150 Min.	100 Min.
VG-30	150-165	150-170	150-165	140 Min.	90 Min.
VG-20	145-165	145-170	145-165	135 Min.	85 Min.
VG-10	140-160	140-165	140-160	130 Min.	80 Min.

*Rolling must be completed before the mat cools to these minimum temperatures.

At no time, shall the difference in temperature between the aggregates and the binder exceed 14^0C, at no time shall bitumen or aggregates be overheated.

8.0 Transportation of Hot Mix

The Hot Dense Bituminous Macadam shall be transported from mixing plant to the site in clean vehicle. Every precaution shall be taken to avoid segregation of the hot mix and to ensure that they do not become contaminated with dust or foreign materials. In order to maintain satisfactory temperature of mix in transit, particularly in cold weather and to prevent undue loss of heat adequate precautions shall be taken by covering the material so that the materials are well protected during transportation. The temperature of the mix in every transporting vehicle shall be checked immediately prior to discharge of mix into the spreader and shall be ensured that the temperature is within the limits as specified in clause 7.0 above. If the temperature of mix in any transporting vehicle is not as per the limits specified in clause 7.0 above, the mix shall be rejected and shall be removed from site immediately.

9.0 Laying

Mix transported from the Hot Mix Plant to the site be spread by means of self-propelled electronic paver with electronic sensor & hydraulic control with suitable screeds capable of spreading, temping and finishing the mix true to the specified width and profile without calling segregation, dragging, bringing irregularities or other surface defects. The paver shall be capable of being operated at a speed consistent with a character of mix and the thickness of the course being laid so as to produce a surface of having uniform density and surface texture. The thickness of the single compacted layer shall not exceed 75mm. The temperature of the mix at the time of laying shall be as per clause

7.0 above.

10.0 Weather Limitation

The bituminous mixture shall not be placed:

i) in presence of standing water on the surface
ii) when the rain is imminent and during rains, fog or dust storm.
iii) When the base course is damp.
iv) When the air temperature on the surface on which it is to be laid is below 10^0C for mix with VG bitumen as binder.

11.0 Rolling

After the mix being spread, rolling shall be carried in three consecutive stages as below:

a) Break down rolling
b) Intermediate rolling
c) Finish rolling

11.1 The initial or Break down rolling shall be done with 8-10 tonne dead weight smooth wheeled roller. The intermediate rolling will be done with 8-10 static weight or vibratory roller or with a smooth wheel pneumatic tyred roller of 15 to 30 tonne capacity having tyre pressure 7 kg/cm2. The contractor shall demonstrate the efficiency of the equipment proposed to be used by carrying compaction trials. Finish rolling shall be done with 8 to 10 tonne steel wheel roller.

Alternatively all the compaction operations i.e. break down rolling, intermediate rolling and finished rolling can be accomplished by using vibratory roller of 8 to 10 tonnes static weight. During the initial or breakdown rolling and finished rolling, the vibratory system shall be switched off. The joints and edges shall be rolled with 8 to 10 tonnes three wheeled static roller.

11.2 Bituminous mixes shall be rolled in the longitudinal direction, with the roller as close as possible to the paver. The overlap on successive passes should be at least one-third of the width of the rear roll or in the case of pneumatic wheeled rollers, at least the nominal width of 300 mm.

11.3 Break-down rolling shall preferably commence as soon as practicable after the mix is spread. The maximum break down temperature at which rolling can commence shall be determined by field trials. The attempt should be to obtain the maximum possible density.

11.4 The principal function of finish rolling is to remove roller marks. The surface shall be carefully examined for residual marks which should be cleanly rolled out. A neat finished appearance shall be obtained.

11.5 Speed Of Rolling

The speed of rolling shall not exceed 4 - 5 km / hr to prevent adhesion of the mixture to the roller. The wheels shall be kept moist but excess of water shall not be permitted. The line of rolling shall not suddenly be changed, thereby displacing the mix. Roller shall not be left standing on the new surfacing.

11.6 Rolling Temperature

The range of temperature during rolling shall be as per clause 7.0 above.

12.0 Joints

12.1 Longitudinal Joints

Longitudinal joints and edges shall be constructed true to the delineating line parallel to the centre line of runway. The longitudinal lane joints shall be truly vertical in straight lines which shall be continuous for the full length of the pavement, or in smooth curves around bends. Joints in the successive asphaltic concrete layers above shall be staggered by 500mm from those the underlying layers. The exposed vertical edges of the longitudinal lane joints shall be carefully cut back and trimmed to firm material in the compacted lane, or for a minimum of one and a half times the layer thickness, whichever is the greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned and painted with hot bitumen immediately before the laying of the adjacent lane. Nothing extra shall be paid on this account.

12.2 Transverse Joints

They shall be formed at right angles to the longitudinal joints, and shall be truly vertical. Transverse joints shall be staggered from each other and in the layers above at least 500mm.

The exposed vertical edges of the transverse joints shall be cut back and trimmed to firm material or for a distance of not less than 1-1/2 times the thickness of layer whichever is greater. All debris/loose material arising from this operation shall be removed from the pavement and the underlying surface cleaned. The exposed joints shall then be cleaned and painted with hot bitumen immediately before the laying of the lane continues. Nothing extra shall be paid on this account.

13.0 Pavement Edges

Pavement shall be laid to correct width and alignment. To achieve straight and vertical edge, Contractor shall either use adequate side shuttering or cut back the edges to correct width and alignment by removing extra mix spread. Nothing extra shall be paid on this account.

13.1 Temporary Ramps

Temporary ramps at the end of each day work shall be made to allow smooth movement of air traffic, as per direction of Engineer-in-charge. Nothing extra shall be paid on account of provision of ramps and nothing shall be deducted in case ramps are not required to be provided. The decision regarding provision of ramps or non-provision of ramps shall rest with the Engineer-in-charge.

14.0 Determination of Field Density

The density of finished paving layer shall be determined by taking cores, or by other approved method no sooner than 24 hour after laying. Methods like 'Nuclear Density Gauge' may be considered as supportive only with proper calibration and verification for the specific situation.

15.0 Quality Control Tests for Dense Bituminous Macadam (DBM):

Apart from the quality control tests given in clause 1.1.1, following additional tests shall be carried out:

S.No.	Test	Test method	Frequency	Acceptance Criteria
1	Quality of binder	IS:73	Number of samples as per lot.	As per IS:73
2	Deleterious materials	IS:2386 (Part-III)	As required by the Engineer- in- charge.	As required by engineer-in-charge
3	Mix grading	IS:2386 (Part-I)	One test for individual constituent and mixed aggregate from dryer for each 400 tonnes of mix subject to minimum of two tests per day per plant.	
4	Stability of mix , flow value, density and void content for Grading-2	ASTMD1559	3 tests for stability, flow value, density and void contents for each 400 tonnes of mix subject to minimum of two tests per day per plant.	
5	Binder content	As per clause 4.0	One test for each 400 tonnes of mix subject to minimum of two tests per day per plant.	As per clause 3.2
6	Density of compacted layer	As per clause 14.0	One test per 700m^2 area.	As per clause 16.1

Note: one test shall consists of 3 samples.

16.0 Acceptance Criteria

16.1 Field Density

The work shall be accepted as of quality, measured and paid in full if the field density does not work out to be less than 98% for DBM of Grading-2 of the Design Laboratory Density worked out in Job Mix Formula in Clause 3.0 above.

When the density achieved in the Field is between 95% and 98% of the Design Laboratory Density, the work shall be accepted as not up to the standard and paid at reduced rate on pro-rata basis of Design Laboratory Density with full rate for 98% density as base.

When the field density works out to be less than 95% of the Design Laboratory Density, the surface shall be further consolidated till the required field density is achieved. If this is not found possible, the work represented by the sample shall be dismantled and redone by the Contractor at his own cost.

16.2 Surface Accuracy

The finished surface of Dense Bituminous Macadam shall be true to level, grade and camber as per the approved drawings and the directions of the Engineer-in-Charge. When a straight edge of 3 metres length is placed longitudinally or transversely, the maximum deviation shall not be more than 6 mm in longitudinal and transverse directions.

The surface accuracy shall be checked immediately after rolling. Surface irregularities which fall outside specified tolerance limits as stipulated in above para shall be rectified by removing to full depth the affected area which shall not be less than 10 Sqm and relaying with fresh materials. In no case shall depressions be filled up with screenings or binding material.

17.0 Measurements:

17.1 Before commencement of laying of Dense Bituminous Macadam, levels shall be taken jointly by the Engineer-in-Charge or his representative and the Contractor at 3 metre intervals both ways or closer as directed by the Engineer-in-Charge. These levels shall be recorded in the level book and plotted on the plan on plain computer sheet by the Contractor at his own cost and the same shall be signed by the Contractor. Proposed formation levels of the finished Dense Bituminous Macadam surface shall be marked at corresponding points. Tack coat shall then be applied and Dense Bituminous Mcadam shall then be laid and compacted to required levels (Tack coat shall be paid separately in the respective item of BOQ). Levels of the compacted bituminous surface shall be taken at grid points at which levels were recorded earlier in the level book and also plotted on the plan. Level books as well as the plan shall be signed by the Contractor as token of acceptance of the levels.

17.2 The volume of compacted mix shall be worked out in cubic meter correct to two places of a decimal as the product of the measured

surface area and average thickness laid. Average thickness shall be worked out on the basis of actual levels. The length and breadth shall be measured correct to cm.

17.3 In case DBM is to be laid on WMM newly laid under this contract, the finished levels of previous surface shall be taken as initial levels for this purpose.

17.4 Quantity for payment shall be the theoretical quantity (Based on Proposed formation levels) or the actual quantity (based on actual finished levels) whichever is less.

18.0 Rate

The rate shall include the cost of all materials, plant machinery and labour required in all operations described above including all carriage and lifts involved. The rate also includes all cost of setting up the laboratory at site and carrying out the quality control measures/tests enumerated above by the Contractor at his own cost in the presence of Engineer-in-Charge or his authorised representative and submission of test results on completion of tests to the Engineer-in-Charge thereof (The item of Tack Coat shall be paid separately and is not included in this item).

********** **END OF ITEM NO. 7** **********

Item No 6: Providing and applying primer coat with bitumen emulsion SS1 grade conforming to IS:8887 on prepared surface of Granular Base including clearing of surface and spraying primer at the rate of 0.70 kg/sqm using mechanical means complete in all respects as per direction of Engineer-In-Charge. The contractor shall quote his rates assuming quantity of bitumen emulsion as 0.70 Kg/Sqm. If the actual quantity of bitumen emulsion varies from the quantity assumed above, necessary cost adjustment for deviation in the quantity of bitumen emulsion shall be done as per rate in actual supply voucher from nearest refinery at the time of execution. The rate of bitumen emulsion exclusive of GST shall only be considered for payment.

1.0 PRIME COAT OVER GRANULAR BASE

1.1 Scope

This work shall consist of the application of a single coat of low viscosity liquid bituminous material to a porous granular surface preparatory to the superimposition of bituminous treatment or mix. The work shall be carried out on a previously prepared granular/stabilization surface.

1.2 Materials

1.2.1 The primer shall be cationic bitumen emulsion SS1 grade conforming to IS: 8887.

1.2.2 The correct quantity of primer shall be decided by the Engineer and shall be such that it can be absorbed by the surface without causing run-off of excessive primer and to achieve desired penetration of about 8-10 mm.

1.3 Weather and Seasonal Limitations

Primer shall not be applied during a dust storm or when the weather is foggy, rainy or windy or when the temperature in the shade is less than 10^0C. Surface which are to receive primer should be damp, but no free or standing water shall be present. Surface can be just wet by very light sprinkling of water.

1.4 Construction

1.4.1 Equipment

The primer shall be applied by a self-propelled or towed bitumen pressure sprayer equipped for spraying the material uniformly at specified rates and temperatures. Hand spraying shall not be allowed except in small areas, inaccessible to the distributor, or in narrow strips where primer shall be sprayed with a pressure hand sprayer, or as directed by the Engineer.

1.4.2 Preparation of Surface

The granular surface to be primed shall be swept clean by power brooms or mechanical sweepers and made free from dust. All loose material and other foreign material shall be removed completely.

1.4.3 Application of Bituminous Primer

After preparation of the surface as per Clause 1.4.2, the primer shall be sprayed uniformly at the specified rate. The method for application of the primer will depend on the type of equipment to be used, size of nozzles, pressure at the spray bar and speed of forward movement. The Contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray, within the tolerances specified.

No heating or dilution of SS1 bitumen emulsion and shall be permitted at site.

1.4.4 Curing of Primer and Opening to Traffic

A primed surface shall be allowed to cure for at least 24 hours or such other higher period as is found to be necessary to allow all the moisture/volatiles to evaporate before and subsequent surface treatment or mix is laid. Any unabsorbed primer shall first be blotted with a light application of sand, using the minimum quantity possible. A primed surface shall not be opened to traffic other than that necessary to lay the next course.

1.5 Quality Control of Work

For control of the quality of materials and the works carried out, the following tests shall be done:

Sl no	Test	Frequency of Tests
1.	Quality of Binder	One set of test for a tanker or lot of 10 tonne as per IS: 8887
2.	Binder Temperature for application	Regular Intervals
3.	Rate of spread of binder Aluminum or other light metal tray of 200 mm x 200 mm size and 20 mm depth are to be used. A set of three plates is essential for one test. All the plates are to be weighed and numbered. These are placed at intervals of 10 m along the surface in path between wheels of bitumen distributor. After the distributor crosses a length of 50 m, trays are to be removed and wrapped in weighed polyethylene bags so that these can be handled, stocked safely for further weighing in laboratory. The trays shall be weighed to first place of decimal. Similarly, transverse distribution of liquid bituminous material can be checked by placing three numbers of plates at interval of 50 cm in the path of binder spraying equipment.	1 test per 1000 m^2 and not less than two tests per day

1.6 Measurement for Payment

Prime coat shall be measured in terms of surface area of application in square meters.

1.7 Rate

The contract unit rate for prime coat shall be payment in full for carrying out the required operations including full compensation for all components as described above including testing and as applicable to the work specified in these Specifications. Payment shall be made on the basis of the provision of prime coat at an application rate of quantity at 0.7 kg per square meter or at the rates specified in the Contract, with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in Clause 1.2.2.

********** **END OF ITEM NO. 6** **********

Item No 8: Providing and applying tack coat (*using bitumen emulsion (Rapid setting) complying with IS:8887 ~~or suitable low viscosity paving bitumen of VG 10 grade conforming to IS:73),~~ spraying the bitumen with mechanically operated spray unit at the rate specified below, cleaning and preparing the existing pavement surface as per specifications complete in all respects as per direction of Engineer-In-Charge. If the actual quantity of bitumen varies from the quantity specified, necessary cost adjustment for deviation in the quantity of bitumen shall be done as per rate in actual supply voucher from nearest refinery at the time of execution. The rate of bitumen exclusive of GST shall only be considered for payment.

a) 0.20 Kg/Sqm on existing bituminous surface
b) 0.30 Kg/Sqm on existing concrete surface

* strike out whichever is not applicable.

1.0 TACK COAT

1.1 Scope

The work shall consist of the application of a single coat of low viscosity liquid bituminous material to existing bituminous or cement concrete surface preparatory to the superimposition of a bituminous mix, when specified in the Contract or as instructed by the Engineer-in Charge.

Note:

i) Provision of tack coat on already primed granular surface be dispensed with.
ii) A tack coat is not mandatory on a freshly laid bituminous layer that has not been subjected to traffic, or contaminated by dust and the next bituminous layer is completed within 2 days.

1.2 Materials

The binder used for tack coat shall be cationic bitumen emulsion (RS1) complying with IS: 8887 or suitable low viscosity paving bitumen of VG 10 grade conforming to IS:73. The type and grade of binder for tack coat shall be as specified in the contract or as decided by the Engineer-in-Charge.

1.3 Weather and Seasonal Limitations

Bituminous material shall not be applied during a dust storm or when the weather is foggy, rainy or windy or when the temperature in the shade is less than 10^0C. Where the tack coat consists of emulsion, the surface shall be slightly damp, but not wet.

1.4 Construction

1.4.1 Equipment

The tack coat shall be applied by a self-propelled or towed bitumen pressure sprayer, equipped for spraying the material uniformly at a specified rate. Hand spraying shall not be permitted except in small areas, inaccessible to the distributor, or narrow strips, shall be sprayed with a pressure hand sprayer, or as directed by the Engineer in Charge.

1.4.2 Preparation of Base

The surface on which the tack coat is to be applied shall be clean and free from dust, dirt, and any extraneous material, and be otherwise prepared in accordance with the requirements. Immediately before the application of the tack coat, the surface shall be swept clean with a mechanical broom, and high pressure air jet, or by other means as directed by the Engineer Engineer-in-Charge.

1.4.3 Application of Tack Coat

The application of tack coat shall be at the rate specified in Table-1 below, and it shall be applied uniformly. No dilution or heating at site of RS1 Bitumen emulsion shall be permitted. Paving bitumen if used for tack coat shall be heated to appropriate temperature in bitumen boilers to achieve viscosity less than 2 poise. The normal range of spraying temperature for a bituminous emulsion shall be 20^0C to 70^0C. The method of application of tack coat will depend on the type of equipment to be used, size of nozzles, pressure at the spray bar, and speed or forward movement. The Contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray, within the tolerances specified.

Table 1: Rate of Application of Tack Coat

Type of Surface	Rate of Spray of Binder in Kg per sq.m
Bituminous surfaces	0.20
Cement concrete pavement	0.30

1.4.4 Curing of Tack Coat

The tack coat shall be left to cure until all the volatiles have evaporated before any subsequent construction is started. No plant or vehicles shall be allowed on the tack coat other than those essential for the construction.

1.5 Quality Control of Work

For control of the quality of materials and the works carried out, the following tests shall be done:

Sl no	Test	Frequency of Tests
1.	Quality of Binder	Number of samples per lot and tests as per 1S:73
2.	Binder Temperature for application	Regular Intervals
3.	Rate of spread of binder Aluminum or other light metal tray of 200 mm x 200 mm size and 20 mm depth are to be used. A set of three plates is essential for one test. All the plates are to be weighed and numbered. These are placed at intervals of 10	1 test per 1000 m^2 and not less than two tests per day

	m along the surface in path between wheels of bitumen distributor. After the distributor crosses a length of 50 m, trays are to be removed and wrapped in weighed polyethylene bags so that these can be handled, stocked safely for further weighing in laboratory. The trays shall be weighed to first place of decimal. Similarly, transverse distribution of liquid bituminous material can be checked by placing three numbers of plates at interval of 50 cm in the path of binder spraying equipment.	

1.6 Measurement for Payment

Tack coat shall be measured in terms of surface area of application in square meters.

1.7 Rate

The contract unit rate for tack coat shall be payment in full for carrying out the required operations including for all components as listed above including testing and as applicable to the work specified in these specifications. The rate shall cover the provision of tack coat, at 0.20/0.30 kg per square meter or at the rate specified in the Contract, with the provision that the variation between this quantity and actual quantity of bitumen used will be assessed and the payment adjusted accordingly.

********** **END OF ITEM NO. 8** **********

Annexure I

Outline of AASHTO T 283, "Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage"

1. Scope and Summary of Test Method

This method covers preparation of compacted bituminous mixtures and the measurement of the change of diametral tensile strength resulting from the effects of water saturation and laboratory accelerated stripping phenomenon with a freeze-thaw cycle. The result may be used to predict long-term stripping susceptibility of bituminous mixtures and evaluate liquid anti-stripping additives that are added to bitumen or pulverized mineral materials such as hydrated lime, which are added to the mineral aggregate. Each set of 6 compacted specimens is divided into two equal subsets. One subset is tested in dry condition for indirect tensile strength. The other subset is subjected to vacuum saturation and a freeze-thaw cycle (thawing in a hot water bath) before testing for indirect tensile strength. Numerical indices of retained indirect tensile strength properties are calculated from the test data obtained by testing the two subsets: dry and conditioned.

2. Testing Equipment

a) Vacuum container, vacuum pump, manometer, and other accessories as specified in ASTM D2041, "Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures".
b) Balance or scale accurate to 0.1 percent of the test load
c) Two water baths capable of maintaining temperatures of 60º C +/- 1º C and
25º C +/- 0.5º C
d) Freezer maintained at –18º C (+/- 3º C)
e) 10-ml graduate cylinder
f) Loading jack and ring dynamometer (Marshall stability testing machine can be used) to provide a vertical rate of deformation of 50 mm (2 inches) per minute and capable of reading the maximum failure load.

g) Steel loading strips with a concave surface having a radius equal to the normal radius of the test specimen. The loading strips shall be 12.7 mm (0.5inch) wide for specimens 100 mm (4 inches) in diameter. The loading strips for 150 mm (6 inches) diameter specimens shall be 19.05 mm (0.75 inch) wide. The length of the loading strips shall exceed the thickness of the specimens. Steel strip are provided at the top and bottom of specimens during indirect tensile testing.

3. Test Procedure

a) Make at least 6 compacted specimens for each mixture, 3 to be tested dry and 3 to be tested after partial saturation and moisture

conditioning with a freeze-thaw cycle. Some extra specimens will need to be made to establish compaction procedures in order to obtain specified air void contents in the test specimens by trial and error.

b) Compact the 6 specimens with a Marshall Compactor so that the compacted specimens have air voids of 7.0 +/- 0.5 percent. This level of high air voids can be obtained by adjusting the number of Marshall blows applied on each side of the specimen by trial and error (start at about 10 blows as a startingpoint). Air void content must be calculated from the bulk specific gravity of the compacted specimen (determined by saturated surface dry method as per procedure given in the Asphalt Institute MS-2) and the maximum theoretical specific gravity of the loose bituminous mixture obtained by ASTM D 2041.

c) Separate the 6 specimens into 2 subsets so that the average air voids of the two subsets are approximately equal.

d) One set will be tested dry. Keep it at room temperature and then place in a 25º C (+/- 0.5 C) water bath for 2 hours prior to determining their indirect tensile strength.

e) The other subset will be conditioned as follows:

i) Place and submerge the 3 specimens in the vacuum container filled with water at room temperature. Apply a vacuum of 13-67 kPa absolute pressure (10-26 inches Hg partial pressure) for 30 minutes. Remove the vacuum and leave the specimens submerged in water for 5 to 10 minutes. (Note: The water saturation procedure noted above deviates from AASHTO T 283, which obtains a specified degree of saturation. The above procedure keeps the time of saturation constant).

ii) Wrap a plastic film around each saturated specimen and place the wrapped specimen in a plastic bag containing 10 ml of water and seal the plastic bag. Place the plastic bag in a freezer at temperature of –18º C +/- 3º C for a minimum of 16 hours. Remove the specimens from the freezer.

iii) Place the specimens in a water bath maintained at 60º C +/- 1º C for 24 hours. Remove the plastic bag and the plastic film from each specimen after placing the specimens under water.

iv) Remove the specimens from hot water bath and place in a water bath maintained at 25º C +/- 0.5º C for 2 hours.

v) Remove the conditioned specimens and test for indirect tensile strength.

f) Determine the indirect tensile strength of the 3 dry and 3 conditioned specimens at 25º C +/- 0.5º C after removing from water bath. First, measure their mean thicknesses (t). Then place the two steel loading strips on the bottom and top of the specimens across diameter and place in the Marshall testing machine or a compression-testing machine.

Apply load to the specimens diametrally at a vertical rate of 50 mm (2 inches) per minute.

g) Record the maximum compressive strength noted on the testing machine and continue loading until a vertical crack appears in the specimen. Remove the cracked specimen from the machine and visually estimate the approximate degree of moisture damage (extent of stripped or bare aggregate) on the fractured faces of the specimen on a scale of 0 to 5 (5 being the most stripping).

h) Calculate the tensile strength of each specimen as follows in SI units:

$St = 2000\ P / \pi\ t\ d$

Where, St = tensile strength, kPa

P = maximum loads, N

t = specimen thickness, mm

d = specimen diameter, mm

j) Express the numerical index of resistance of bituminous mixture to the detrimental effects of water as the ratio of the original strength that is retained after accelerated moisture and freeze-thaw conditioning. Calculate the tensile strength ratio (TSR) as follows:

Tensile strength ratio (TSR) = S2 / S1

Where,

S1 = average tensile strength of the dry subset, kPa

S2 = average tensile strength of the conditioned subset, kPa

A) PRECISION APPROACH PATH INDICATOR (PAPI)

GENERAL

This specification covers the requirements of PAPI units used to offer information with regard to approach slope to landing pilot to carry out approach procedure with utmost accuracy and safety.

The PAPI system shall consist of the following components:

a) Four identical light units.

b) Current powered (series circuit) system.

c) Angle aiming and calibration equipment's.

The manufacturer shall submit the required details as per Annex1 enclosed here in.

Environmental requirements

The equipment should be designed for outdoor installation and continuous operation under the following environmental conditions:

- Temperature: Any temperature from –20ºC to +55ºC.
- Humidity: Any relative humidity upto 100%.
- Sand and dust: Exposure to wind borne sand & dust particles.
- Wind-blown rain: Exposure to wind blow rain from any direction.
- Wind: Exposure to wind speed upto 161 KM/Hr. from any direction.
- Salt Spray: Exposure to a salt laden atmosphere.
- Sunshine: Exposure to solar radiation.

Photometric requirements

The light unit shall have three lights to give light intensity of peak white minimum 100000 cd and red at 15% of this and shall provide a beam of light split horizontally to produce white light on the top sector and red light in the bottom sector. When viewed by an observer at a distance of 1000 feet (300 Mts.) the transition from red to white light shall occur within an angle of 3 minutes. The light distribution isocandela diagram and the intensity required for each light unit shall be in accordance with aerodrome design manual Part IV, Annex 14 of ICAO. The light colour shall be aviation white and aviation red. The lamps shall have a minimum rated life of 1000 hrs in this application and shall achieve full intensity within 5 seconds after a cold start.

Light Unit Construction

Each light unit shall be designed so that dynamic loading due to wind or static loading due to

snow will not cause the light pattern to be displaced. The light unit shall have an overhang or other means to inhibit rain or snow from reaching the optical lens. Provision to drain condensation water through wire gauze cover drain hole shall be available in the basis of PAPI unit. The hardware used shall be of stainless-steel to ensure fully corrosion proof.

Aiming

The light unit shall be provided with integral adjustments to permit accurate vertical positioning of the centre of the light beam at an elevation between 2º and 8º. The centre of the light beam is defined as the transition band between red and white light.

Mounting Provision

The light unit shall have suitable number (3 or 4 nos.) of mounting legs to provide stability and these shall be adjustable to permit leveling where one side of the unit is installed 25 mm higher / lower than the opposite side or adjoining unit. The legs shall consist of mounting and height adjusting hardware, assembly. Breakable coupling and flanges shall be suitable for mounting on concrete pad. The adjusting hardware shall be designed to prevent any displacement of the optical system due to vibration.

Aiming Device (Checking Stick)

An aiming device shall be supplied that will indicate the vertical angle of the light beam centre within an accuracy of + 3 minutes of arc. The vertical coverage of aiming device shall be suitable for the full beam depth or as per manufacturer's recommendations.

OR

New generation digital angle instrument compliance to ICAO guidelines and same as placed inside each PAPI unit as per OEM is also acceptable.

Adjustable Clinometer

The adjustable clinometer shall be capable of checking correctness of the angle set of PAPI units at site and to change its setting if required without disturbing the system. The unit shall be capable to adjust the setting up to 8 degree in the increment of 5 minute. (This is not part of supply of PAPI units unless specifically ordered for)

Preset Aiming Device

New generation digital angle instrument compliance to ICAO guidelines and same as placed inside each PAPI unit is also acceptable. In that case, aiming device and checking stick are not required.

OR

The fixed aiming device shall have four pieces for which the angles are preset for a value of 2º 30', 2º 50', 3º 10' and 3º 30' or for the angles specified in the tender. The aiming device shall also

have one zero degree preset for leveling the system before calibration.

Leads

All the wiring shall be introduced into the light unit through leads fitted with factory moulded plugs. The length of the leads shall be adequate to extend from the unit through a flexible conduit to a frangible coupling at the ground level. Strain relief shall be provided to prevent pulling on the lead from being transmitted to its connections in the light units. The plugs shall match with the secondary lead of the isolating transformer.

Power Supply and System Control

The system shall operate directly from a series lighting circuit having a operating current range of 2.8 amps to 6.6 amps.

Equipment Finish

The exterior of all units shall be either a bright orange or aviation yellow to maximize the conspicuity of the equipment.

Material

All parts and material shall be suitable for the intended purpose and shall be adequately protected against corrosion. The components shall have adequate capacity to operate with the system voltage specified without failure. Any plastic components exposed to sun light shall be made of U.V. stabilized material. Ferrous metal shall be galvanized or given other equal corrosion protection treatment. Copper bearing hardware in contact with the aluminum shall be plated with cadmium, nickel or zinc.

Maintenance

All system components shall be designed for ease of maintenance and shall have mean-time-between-failures of at least six months (excluding replacement of lamps). If required, means shall be provided for refocusing the system after replacing lamps. The design of the system shall be such that adjustment and repair can be made with commercially available tools. Special tools if required for servicing shall be furnished by the manufacturer / tenderer.

Workmanship

The equipment shall be fabricated in accordance with the highest quality workmanship. All wiring shall be neatly run and laced. All sharp edges and burrs shall be removed. Painted surfaces shall be free from scratches etc.

Tests

The following tests are required to demonstrate compliance with the specification. The test may be run on power supply and a single light unit with the other unit simulated by a resistive load.

a) **Visual Examination**: The equipment shall be examined for compliance with the requirement on size, weight, material finish, and quality of workmanship.

b) **High temperature test:** A high temperature test shall be conducted by subjecting the equipment to a suitable temperature of +55ºC (± 5ºC) for a period of 4 hrs, after temperature stabilization. The system shall be operated throughout the test. Any deterioration in material or performance will cause for the test failure.

c) **Low temperature test:** A low temperature test shall be conducted by subjecting and exposing the system to a minimum of –20ºC for 24 hours. The equipment shall be operated at the beginning and end of the test. Any deterioration in material or performance will be cause for test failure.

d) **Rain Test:** A wind-blown rain test shall be conducted by subjecting and exposing the equipment to rain at a rate of 130 mm. per hour with an exposure time of 30 minutes per side. The system shall be operated throughout the test. Any deterioration of system performance or excessive accumulation of water in equipment cabinets shall be cause for test failure.

e) **Salt fog test**: A salt fog test shall be conducted by subjecting and exposing the equipment to a test of duration of 48 hrs for exposure and 48 hrs drying. Any evidence of damage, rust, pitting or corrosion (except to sacrificial coatings) shall be cause for test failure.

f) **Wind loading:** Shall demonstrate by wind tunnel tests or static loading that the system will withstand the specified wind speed up to 161 KM/hr. from any direction in azimuth without displacing the optical pattern more than allowed in the rigidity test.

g) **Photometric test:** Shall conduct a photometric test to prove conformance with the colour intensity and beam pattern requirement as given above under photometric requirement.

h) **Rigidity Test:** A uniformly distributed load (sand or other materials) of 73 kg/M^2 shall be applied over the entire top surface of the light unit. Before applying the load, the unit shall be setup and the light pattern displayed on a vertical surface 20’ (6 Mt.) from the front of the unit. The top, bottom and sides of the beam pattern and any other characteristic features shall be marked on the wall. A framework or other method may be used to ensure that the sand used to load the system does not spill over the sides. The load shall then be applied by letting the sand pour down on the centre of the light unit. After loading the unit with required amount of material, the beam pattern shall be checked for displacement from the markings and the load shall be left in place for 5 hours. Upon removal of the load, the beam pattern shall again be checked against the original markings. Under all conditions the beam pattern shall remain within ± 0.25” (6 mm) of the original markings.

i) **Aiming device test:** Shall conduct a test of the aiming device to demonstrate that, when the light unit is moved via the adjustment mechanism the measuring device registers the change within the allowable tolerance. The measuring device shall be checked at one degree

intervals throughout the system's adjustment range.

j) **Operational test:** Shall conduct an operational test to demonstrate the compliance with all operating requirements. The system shall be operated with one lamp per light unit to demonstrate that the proper voltage is still applied at the sockets of the operational lamps. Shall demonstrate that failure of a lamp will not produce transients large enough to damage the remaining lamps.

k) **Insulation resistance (dry test):** This test shall be carried out as per IS 1913(latest edition).

l) **High voltage test:** All fittings shall satisfactorily withstand the application of HT voltage as per IS 1913(latest edition).

The manufacturer shall produce type test certificate from Govt. laboratory for all the tests described above which shall be valid for a maximum period of five years even if the design as per the original type tests are not changed.

Acceptance Test

The following tests shall be carried out as acceptance tests by the inspecting officer of AAI.

i. Visual Examination
ii. Rain Test
iii. Photometric Test
iv. Aiming Device Test
v. Operational Test
vi. Insulation Resistance

Packaging

Packaging shall ensure full protection to the equipment against corrosion and deterioration or physical damage during handling and transportation by air, road, rail or sea. With the equipment a packaging list giving full details of the contents of the case including name of manufacturer, order number, brief description of contents etc.

ANNEXURE – I

TECHNICAL PARTICULARS TO BE FURNISHED BY THE MANUFACTURER

1. Make :
2. Model No. :
3. No. of Lamps per unit :
4. Type No. of Lamps :
5. Life of Lamp :
6. System acquisition range when 3 lamps ON :

a) By DAY MET visibility 37 Kms

i) White Light :

ii) Red Light :

b) By DAY MET visibility 7.4 Kms

i) White Light :

ii) Red Light :

c) By NIGHT MET visibility 37 Kms

i) White Light :

ii) Red Light :

7. System Acquisition range when one lamp failed and 2 lamps ON, MET visibility 7.4 Kms.

i) White Light :

ii) Red Light :

8. Beam Spread

a) Horizontal :

b) Vertical :

9. Transitional Angle :
10. Catalogue :

B) CONSTANT CURRENT REGULATOR

1. SCOPE AND CLASSIFICATION

1.1 Scope:

The specification sets forth the requirements for Constant Current Regulators (CCRs) for use in airport series lighting circuits. The CCRs shall be of electronic type with thyristor control.

1.2 Applicable Specifications:

The CCR shall confirm to the specification described herein.

1.3 Classification:

Two types, two classes, two styles and eight sizes of Constant Current Regulators are covered by this specification. The various combinations covered under scope of this work are shown in table 1:

Table-1: Regulator Classification

S. No.	Rating	Type		Class		Style	
		Output Max. Current		Input Voltage		No. of brightness steps output	
	kW	6.6A (I)	20A (II)	240V	415V	3-step (I)	5-step (II)
1.	4	X		X			X

General: The Constant Current Regulators described herein are intended to be power sources for series lighting circuits on airports.

1.4 Environmental Requirements

The CCRs shall be designed for continuous indoor operation under the following conditions:

- Temperature range of –15º C to +55º C at sea level.
- Relative humidity range of 10% to 95%. 100%
- Altitude range of 0 to 10000 feet above MSL.
- Salt spray ñ Exposure to salt ladden atmosphere

1.5 Regulation -Resistive load requirements

The regulator shall maintain the output current within the limits of table II at any load between no (short circuit) load and full load. The current setting device shall have provision to vary its setting. The change in setting shall be continuous (no break) and smooth.

TABLE II(a) : Output Current (6.6 Amps)

Brightness step	**Nominal RMS output current (amps)**	**Output current limit (amp)**
	Style II	
1.	2.80	2.72 – 2.88
2.	3.40	3.30 – 3.50
3.	4.10	3.98 – 4.22
4.	5.20	5.04 – 5.36
5.	6.60	6.40 – 6.70

1.6 Regulation Reactive load requirements

When the regulator is loaded with isolating transformers and suitable lamps and the secondaries of 30% of the transformers are open circuited, the output current shall remain within limits given in table II (a) as applicable, for all brightness steps. The load before opening the isolating transformer secondaries shall be any value from half load to full load.
The Voltage ratio of main power transformer shall be selected to cater for condition of 30% open circuited isolating transformers or input voltage variation upto -10% whichever is higher. This is, however, subject to the condition that the transformer ratio shall not be less than 1.15

1.7 Efficiency

The efficiency of the regulator operated with rated input voltage into a full load having unity power factor shall not be less than the value given in table III.

TABLE III : Regulator Input efficiency

Sr. no.	Capacity of CCR (kW)	Minimum overall efficiency (%)
1.	4	90

1.8 Power Factor:

The power factor for regulators of capacity 10 KW and below shall be not less than 90% and for regulators of capacity more than 10.0 KW it shall not be less than 95%. The power factor shall be measured with the regulator operating on the maximum intensity setting, at rated input voltage and into a rated resistive load.

1.9 Temperature Rise

Determine the winding temperature by resistance method for both primary and secondary coils, obtain the temperature rise after operating the regulator continuously for a period of 4 to 6 hours at full load and at unity power factor. The maximum temperature rise of the regulator under these conditions shall not exceed 65°C.

1.10 Control System

The control system shall stabilize at any intensity setting within 5 seconds and shall hold the output current stable within ± 0.1 amp at any output setting. The control system shall be designed for both local and remote control Circuit lengths up to 3000 Mts. using 2.5 sqmm copper control cable as required. Remote control shall not affect the regulator performance characteristics. Voltage for the control system shall not exceed 120 Volts and shall be of self-generated and integrated.

2.1 DETAILED REQUIREMENT

2.1 Input voltage

Input voltage shall be single phase / three phase 50 Hz A/C supply as follows:

a) For regulators 7.5 KW and below – 240V ± 10%

b) For regulators 10.0 KW and above – 415 ± 10%

The input voltage range as mentioned above has to be considered in designing the electronic components of control circuit and transformer etc. The regulator shall be designed to withstand momentary over voltage up to 120% of nominal input voltage without being shut off or damaged by such over voltage. The duration of such over voltage excursions shall be no longer than 50 milliseconds and shall occur no more than once per minute.

The terminals of incoming cables in the CCR shall be properly shrouded by a transparent hylam / mica sheet of not less than 10mm.

Incomer MCCB of suitable rating shall be provided in CCR for ON / OFF function in addition to fuses

2.2 Rating

Design the regulator to supply the applicable range of current to a load of incandescent/halogen filament lamps, with each lamp connected to an individual isolating transformer. Determine the regulator load by multiplying the output voltage and current obtained at brightness step 5. The calculated KW is not less than the KW rating of the regulator.

2.3 Circuit Isolation

The power input circuit shall be electrically isolated from the output circuit. The peak output voltage of an open-circuited regulator shall not exceed two times the rated wattage divided by the rated current or 4250 Volts peak, whichever is greater. These measurements shall be made with an oscilloscope or high voltage peak reading meter.

2.4 Primary Switch

The regulator shall have an integral remotely controlled primary switching device operated by control voltage. It shall operate via remote control & shall not interrupt power to remote control.

2.5 Control and External Power

The CCR shall be used with control supply of 24/48 volts. This control supply shall be generated in CCR Panel and shall be available for Remote /Brightness Controls as well as primary switch (ON -OFF) of CCR.

2.6 Open-circuit Protection

The regulator shall include an open-circuit protective device to open the primary switch within 2 seconds after an open-circuit occurs in the secondary. The device shall reset within 2 seconds after the control switch is turned off and re-energized.

Open circuit indication on CCR shall be ON only when over voltage cum Zero current occurs.

2.7 Over-current protection

Constant current Regulators of all capacities shall include an over-current protective device that opens the primary switch when the output current exceeds the normal set output current by 5%. The device shall operate within 5 seconds after an over-current of 5% and within 1 second after an over-current of 25%. The device shall reset within 2 seconds after the control switch is turned off and re-energized. The over current protection shall not be activated by a momentary (0.25 second) over-current caused by switching off load circuits or by other transients. The over

current protection device shall house provision to vary its settings. The change in setting shall be of continuous (no break) and smooth.

2.8 Input Power Loss

In the event of loss of input power long enough to affect the regulator output current, the regulator shall resume operation on the selected brightness setting within 5 seconds after the restoration of input power.

2.9 Remote / Local Control Switch

A multi-position selector switch to select Remote, OFF, Local and brightness control shall be located for ready access by an operator without opening doors or removing covers. Mark the position of the by selector switch as below:

Remote, Off and Local: Provide connections for these positions as follows:-

Remote: Remote control circuit connected and local control circuit open (the remote control station is not furnished as part of this assembly).

OFF: Remote and local control circuits open.

Local: Local control circuit connected and remote control circuit open. Provide brightness selector switch (5steps or 3 steps as applicable) to control the regulator locally. CCR shall have provision to control the brightness from remote.

Remote control brightness selector switch unit is not a part of the CCR.

All the selector switch used for brightness selection shall be of minimum 1 amp current carrying capacity and should be robust in construction.

All the relays used in the CCR shall be plug-in type with “ON” indication and with retainer

spring.

Separate relay shall be used for each brightness step.

Back indication: Back indication is required to know whether the CCR is ON and the series circuit is energized or not. The indication shall be provided on the CCR. Provision shall also be made in the CCR for back indication arrangement on remote control panel.

Provision shall be made in the CCR and remote control panel to provide positive back indication of CCR ON by monitoring the output current through a C.T. and operation of a separate relay with at least one spare contact.

2.10 Out-put Ammeter

A flush mounted, true R.M.S. indicating digital ammeter to indicate output current shall be provided on the front of the regulator so that it may be easily read. The meter accuracy shall be at least +1%.

2.11 Terminal Block and Wiring

A pressure type terminal block having suitable voltage rating shall be installed in the control cabinet. Label the termination as shown below. The terminal block shall accommodate 3.25 sq. mm. to 0.52 sq. mm (No. 12 to 20 SWG) wire with an insulation rating up to 600 volts. At least five spare terminal block position shall be provided in addition to those listed below. Terminal XCP and N need be supplied only if external control voltage is used.

Terminal Function	Label
a. Power supply for remote control panel	CCI
b. Return from remote ON/OFF switch	CC
c. Return from remote intensity switch (06 terminals to be provided)	OFF-B1-B2-B3-B4-B5
d. Input for external control power (optional)	XCP
e. Neutral for external control power (optional)	N

2.12 Regulator Enclosure

The regulator and the transformer shall be housed in a sheet steel enclosure of 2 mm. thick all around and the construction shall meet IP 42 class of protection. The enclosure shall be equipped with a hinged / removable cover that is held securely in place by cap screws. Foot or channels shall be attached to the bottom of the enclosure so that there will be a gap of not less than 2” (5 cm.) is available between the enclosure and the floor. Detachable cable gland plates for incoming and outgoing cables shall be provided. Four enclosed terminals (for input and output) suitable for voltages involved shall be located on the front side of the enclosure with each pair labelled ‘input’ or ‘output’ as applicable. Lifting hooks shall be installed on the enclosure.

Overall physical size of the complete regulator assembly shall be such that it will pass through an opening of 39” wide by 78” height (1 Mt.x2 Mts.). Two ground terminals shall be installed on the outside of the regulator enclosure.

A suitable steel control cabinet or compartment for housing the relays, control cards, the control terminal block, the remote/local control switch and other low voltage compartments shall be

either permanently attached to or an integral part of the enclosure. All low voltage control components shall be accessible by opening the cabinet. The cabinet shall close tightly in order to minimize entry of insects and airborne foreign material.

The CCR compartment shall be suitably partitioned to segregate vertically / horizontally all power & control circuits.

There shall be a provision of 1 no. 6 pin piano type 15A/5 A socket and switch at a suitable location duly wired.

2.13 Capacitors:

Capacitors shall be provided for power factor correction to meet the requirement specified above under 'power factor'.

2.14 Output current surge limitation:

The regulator shall be designed so that any output surges caused by switching the regulator ON and OFF, changing brightness steps, or shorting the load will not damage series incandescent/Halogen lamps. If time delay is utilized, not more than 2 seconds shall elapse from when the regulator is turned on to when the current is delivered to the load terminals. Pulsation or hunting of output current shall be limited to 5 seconds or less under all conditions of switching.

2.15 Wiring Diagram:

A legible wiring diagram shall be permanently mounted in an unobstructed place in the control cabinet.

2.16 Painting and Finishing:

Inside and outside of the enclosure one primer coat and two or more finish coats of oil proof and weatherproof paint are to be applied. The outside of the enclosure shall be finally painted after assembly and testing are completed.

2.17 Name Plate

A name plate with the following minimum information shall be securely attached to the front of the regulator enclosure:

a) Constant Current Regulator,_____phase.

b) Input:_____V at_____Hz_____amps.

c) Control:_____V at_____Hz.

d) Identification:_____Serial No._____

e) Output:_____KW at_____amps.

f) Output:_____amps (at each step)

If the name plate is attached to a readily removable surface such as a cover, the serial number shall be duplicated in a permanent conspicuous place elsewhere on the Regulator.

2.18 Instruction Book

Three copies of instruction books with the following minimum information shall be furnished with each regulator.

- Complete schematic and wiring diagrams showing all components cross-indexed to the parts list.
- Complete parts list with applicable rating and characteristics of each part and with the component manufacturers' part number.
- Installation instruction manual.
- Maintenance instruction manual with wave forms at various stages.
- Troubleshooting charts including test point voltages at different points of the control cards during normal condition.
- Theory of operation**.**
- Detailed circuit drawing with components for all printed circuit boards shall be supplied before the CCR is dispatched from the factory.
- Drawing are to be got approved with sequence of operation before inspection.

2.19 Special provisions

All capacities of CCRs shall be provided with earth fault monitor device with calibrated earth leakage meter on the front panel.

2.20 Lightning arrestors

Lightning arresters of the size necessary to protect the regulator shall be installed across the regulator output terminals. The groundside of the arrestors shall be connected to the grounding lug of the enclosure. The lightning arrestors shall be able to handle the pulse specified below under 'transient suppression' as a minimum. The leads of lightning arrestors at the output Circuit of CCRs shall be separated and provided with backlight sleeves so that the leads are not short circuited during lightning, to prevent of lightning induced surges to the CCRs. All earth pits for lightning arrestors shall be interconnected to each other.

2.21 Warning Plate:

A plate with below mentioned warning shall be affixed to the front of the regulator control cabinet door.

WARNING

"REMOVE MAIN INPUT AND CONTROL POWER

BEFORE OPENING COMPARTMENT"

2.22 Indications

To indicate failure of SCR fuse, over current trip, open circuit trip, CCR ON/OFF and remote/local indication lamps shall be provided on the front of CCR panel. Audible alarm shall also be provided for fault conditions.

Power supply "ON" indication shall be provided on the panel front side of CCR which will indicate incoming MCCB is "ON" and power is available in the CCR, even when CCR is not "ON".

CCR shall be provided with CCR fail indication with resettable alarm. CCR fail indication should come only in fault condition, not during initial start.
All indication lamps used in the CCR shall be LED type.

3 QUALITY ASSURANCE PROVISION

3.1 Type test

The manufacturer shall possess satisfactory test certificate for all the tests described here in for equal or higher capacity than the capacity specified in BOQ. The test certificate from Government laboratory is acceptable. The test report shall not be older than 5 years even if the design as per the original type test is not changed.

3.1.1 Testing

3.1.1.1 Regulation test

The following tests shall be performed to demonstrate compliance with the requirement specified under 'regulation' and table II. Where isolating transformers and lamps are not specifically available, a resistive load may be used. For reactive load test suitable inductive load should be used.

3.1.1.2 Input Voltage Tests

Load the regulator to full load and energize it with nominal input voltage, 110 percent of nominal voltage, and 90 percent of nominal voltage and verify that the output current falls within the

limits of table II. Repeat this test at half load and short circuit. These tests shall be repeated at all brightness settings.

3.1.1.3 Inductive load test

An equivalent of full load and half load shall be placed on the regulator, but with 30 percent of the isolating transformers open-circuited. The input voltages shall be nominal, 110 percent of nominal, and 90 percent of nominal voltage. The output current shall be checked at all brightness settings and shall be within the limits of Table II.

3.1.1.4 Remote Control Test

Check the output current at all brightness steps using the following remote control circuits (a resistance load may be used in lieu of the full length specified) and rated output load:

a) Connect the remote switch by simulated 30 mtr length of 1.5 sq mm copper control cable having a resistance equal to 0.16 ohm per wire, operate the regulator remotely on all brightness steps to determine compliance with clause 1.8.

b) Connect the remote switch by simulated 3000 m lengths multicore cable having resistance equal to 87 ohm per 3000 mt of wire and a capacitance of 0.16 microfared. Operate the regulator remotely on all brightness steps to determine compliance specified above under ‘control system’.

3.1.1.5 Temperature rise

Determine the regulator temperature rise in accordance with relevant IS specifications.

3.1.1.6 Efficiency

With nominal input voltage and a full load of output of unity power factor, determine that the efficiency of maximum brightness is not less than specified in table III.

3.1.1.7 Power Factor

With nominal input voltage and full load of output of unity power factor, determine that the input power factor at maximum brightness is not less than that specified above under ‘power factor’.

3.1.1.8 High Temperature

Place the regulator in a test chamber and maintain the ambient temperature at 55ºC + 2ºC. After the temperature of the regulator components has stabilized, operate the regulator for 4 hours at full rated input voltage and output current. Perform the tests specified above under ‘input voltage tests’ to demonstrate compliance.

3.1.1.9 Humidity

Regulator shall be tested for resistance to humidity at the maximum temperature of +55º C. Perform the tests specified above under 'input voltage tests' to demonstrate compliance.

3.1.1.10 Dielectric tests

Test the circuits of all regulator sizes to determine the equipment's ability to withstand the following rms 50Hz test voltage for 1 minute without failure:

- 240V/440V input circuit to ground – 2,000 V.
- 2,400 volts input circuit to ground – 19,000 V.
- 240 V control circuits to ground – 2,000 V.
- 120 V control circuits to ground – 1,000 V.
- 24/48 V control circuits to ground – 500 V.
- Output circuit to ground – 5 times the full load RMS voltage. Lightning arrestors shall be disconnected during the test.

3.1.1.11 Protective device tests

Test all protective devices for proper operation as specified above under open circuit protection, over current protection and earth fault protection. Also test to determine the open-circuit voltage as specified above under 'circuit isolation'. Disconnect the open-circuit protection for this test.

3.1.1.12 Transient Suppression

To determine the effectiveness of the lightning arrestors, they shall suppress a test pulse on the out- put lines consisting of a 10 by 20 microsecond current surge of 15,000 amperes with the subsequent power-follow current and a voltage surge of 10 KV per microsecond minimum without damage to the regulator.

3.1.1.13 Output Current Surge

Check the regulator to determine compliance as specified above under 'output current surge limitation'.

3.1.2 ACCEPTANCE TEST

The following shall constitute Acceptance test:

a) Regulation test

b) Remote control test

c) Efficiency test

d) Dielectric test

e) Protective device test

3.1.3 ROUTINE TEST

The following tests shall be carried out as routine tests in the factory by the manufacturer and furnish the test results.

i. Regulation test

ii. Input Voltage test

iii. Inductive load test

iv. Remote control test

v. Temperature rise test

vi. Efficiency test

vii. Power factor test

viii. Dielectric test

ix. Protective device test

3.1.4 Packaging

Packaging shall ensure full protection to the equipment against corrosion and deterioration or physical damage during handling and transportation by air, road, rail or sea. With the equipment a packaging list giving full details of the contents of the case including name of manufacturer, order number, brief description of contents etc shall be enclosed.

3.1.5 Installation, Testing & Commissioning

All the control wiring required for successful operation of CCRs to achieve the lighting pattern, termination, glanding of cables, lugs etc are included in the scope of work and nothing extra will be paid in this regard.

C) SPECIFICATION FOR AIRFIELD LIGHTING CABLE

General

This specification covers the requirements for single / double core, copper conductor, PVC insulated, PVC sheathed unshielded (unscreened) type airfield lighting cable for use on 5KV system (unearthed system). Cable shall be generally conforming to IS: 1554-part II (latest edition) and details specified below.

Conductor details single core

a) Size	:	6 & 16 sq.mm
b) Material		High conductivity annealed copper wires
c) No. of strands per core		Minimum 7 for 6&16 sq.mm
d) No of cores		Single / Double core as per BOQ
e) Dia. of strand		The diameter of each strand shall be chosen to achieve 6 & 16 sq.mm and not to exceed the maximum resistance of the conductor as per IS. The maximum resistance of the conductor at 20° C as per IS 8130 -1984 are 1.15 ohm per km for 16 sq.mm and 3.08 ohm per km for 6 sq.mm

Insulation

a) Composition of insulation	:	P.V.C Type 'B' to meet the requirement of Clause 4.1 of IS 1554 part II
b) Thickness of insulation	:	Single core & Double core Average thickness of PVC insulation shall not be less than 3.60 mm, but not less than 3.14mm at any point as per IS:1554 part II -1988, for 6 & 16 sq mm.
c) Insulation colour	:	6 & 16 Sq.mm single core – Yellow 6 & 16 sq.mm double core – Red & black

Outer sheath

a) Outer Sheath Colour	:	6 sq.mm single core– black & 16 Sq.mm single core– Blue 6 & 16 sqmm double core - Black
7 Composition of sheath	:	PVC compound confirming to the requirement of Type ST1 compound of IS 5831-1984 with up-to date amendments.
8 Thickness of sheath		Single core / Double core i) 1.8 mm average thickness for 6 & 16 sq.mm ii) At no place it should be less than 1.24 mm for 6&16 sq. mm .

PVC insulation and outer sheath shall be done in pressure extrusion by PVC extruding machine. The sheathing shall be so designed so as to afford high degree of mechanical protection and shall also be oil weather resisting and treated for anti-rodent & termite.

Operating temperature : (-) 20 deg C to (+) 70 deg C.

Overall diameter of cable has to be arrived at keeping in view of the above duty conditions.

Length

Length of cable in one drum shall not exceed 1000 mt + or -5%. Variation to the extent of + or -5% of ordered quantity is acceptable or as specified in the agreement.

Bending

Minimum radius of cable during bending 90 mm approx..

Marking

Manufacturer's trade name, voltage, grade, year of manufacture etc shall be embosses on the outer sheath at regular interval. The cable shall also have sequential numbering at 1 mtr. interval indicating the length of the cable.

Test	**Requirement**	**Test Method**
a)Tests on conductor	IS 8130	IS 10810/1
b)Resistance test	IS 8130	IS 10810/5
c) Test for thickness of insulation & sheath	IS 1554 (part 2)	IS 10810/6

d) Physical tests for insulation & sheath		
i)Tensile strength & elongation at break	IS 5831	IS 10810/7
ii)Aging in air oven	IS 5831	IS 10810/11
iii)Shrinkage test	IS 5831	IS 10810/12
iv) Hot deformation test	IS 5831	IS 10810/15
v) Loss of mass in air oven	IS 5831	IS 10810/10
vi) Heat shock test	IS 5831	IS 10810/14
vii) Thermal stability test	IS 5831	IS 10810/60
viii) Water absorption	IS 5831	IS 10810/33
e) Insulation resistance test	IS 5831	IS 10810/43
f) High voltage test	IS 1554 (part 2)	IS 10810/45
g) Flammability test	IS 1554 (part 2)	IS 10810/53

The above mentioned type tests shall be carried out for initial approval of the cables and shall be valid for maximum five years even if the design as per the original type tests are not changed.

Acceptance test

The following tests shall be carried out as acceptance tests by the inspecting officer of AAI.

a) Conductor resistance test.

b) Test for thickness of insulation and sheath

c) Tensile strength and elongation at break of insulation & outer sheath

d) Test for insulation resistance.

e) Anti-rodent/anti-termite test.

Procedure for anti-rodent/anti-termite test

A few chippings of the PVC compound is slowly ignited on a porcelain dish or cubicle in a muffle furnace at about 600° C. The resulting ignited ash is boiled with little ammonium acetate solution (10%). Place a drop of ageous sodium sulphide solution on a thick filter paper and allow to soak. Touch the spot with a drop of above extract. A black spot indicate the presence of lead – the anti-termite & rodent compound.

Routine test

The following shall be carried out as routine test:-

- Conductor resistance test
- High Voltage test
- Annealing test for copper conductor

The manufacturer shall produce the routine test certificate to the inspecting officer of AAI for all the drums offered for inspection.

Samples

Samples shall be taken and tested from each lot for ascertaining the conformity of the lot to the requirement of specifications.

The number of samples to be selected shall depend on col 1 and 2 as indicated below :

Number of Drums Number of in the LOT	**Number of Drums to be taken as sample**	**Permissible defectives**
(N)	**(n)**	**(a)**
(1)	**(2)**	**(3)**
Up to 50	2	0
51 to 100	5	0
101 to 300	13	0
301 to 500	20	1
501 and above	32	2

Number of Tests and Criterion for Conformity

Suitable lengths of test samples shall be taken from each of the drums selected. These test samples shall be subjected to each of the acceptance tests. A test sample is called defective if it fails in any one of the acceptance tests. If the number of defectives is less than or equal to the corresponding permissible number given in col 3 under the table above, the lot shall be declared as conforming to the requirements of acceptance tests, otherwise not.

Acceptance test certificate and type test certificate

Acceptance test and type test certificate shall be submitted to Engineer in charge along with the supply of cable.

Packaging

The cable shall be wound on a wooden drum of suitable size and packed. The ends of the cable shall be sealed by means of non-hygroscopic sealing material.

D) ISOLATING TRANSFORMER FOR 5KV SERIES CIRCUIT

General

This specification covers completely enclosed Thermoplastic elastomer materials covered isolating transformer for use of 6.6 and 20 amps series airport lighting circuits having nominal voltage rating of 5KV. The transformer shall be water tight and shall be designed for direct burial in the earth or installation in a base. The isolating transformer shall confirm to IS specifications 12290 (latest edition).

Rating

The transformer shall be of rating as specified in schedule of quantities and all rated for operation on 50 Hz.

Operating conditions

The transformer shall be constructed for continuous outdoor service at any ambient temperature from minimum of (-) 15 degree C to a maximum of 65 degree C. They shall operate properly when buried in the ground with 5KV on the primary winding. The transformer shall be designed to operate satisfactorily at rated 50 Hz. Frequency.

Transformer characteristics

The characteristics of the transformer shall be within the limits as specified below in Table 1.

Table 1

Primary				Secondary amps		Secondary	
Watt	**Amps**	**P.f.**	**Eff. %**	**Full load**	**Short Ckt.**	**Load Ohms**	**Max. open Ckt. V.**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
10/15	6.6	95	70	6.53 - 6.67	6.6 - 7.1	0.34	8.0
20/25	6.6	95	70	6.53 - 6.67	6.6 - 7.1	0.57	8.0
30 / 45	6.6	95	80	6.53 — 6.67	6.6 — 7.1	1.15	25
30 / 45	20.0	95	80	6.53 — 6.67	6.6 — 7.1	1.15	25
65	6.6	95	80	6.53 - 6.67	6.6 - 7.1	1.6	30
100	6.6	95	85	6.53 — 6.67	6.6 — 7.1	2.44	70
100	20.0	95	85	6.53 — 6.67	6.6 — 7.1	2.44	70
150	6.6	95	85	6.53 — 6.67	6.6 — 7.1	3.58	70

150	20	95	85	19.8 — 20.2	6.6 — 7.1	3.58	70
200	6.6	95	90	6.53 — 6.67	6.6 — 7.1	4.82	100
200	20.0	95	90	6.53 — 6.67	6.6 — 7.1	4.82	100
300	20.0	95	90	19.8 — 20.2	20.0 — 22.0	0.90	70
300	6.6	95	90	6.53 — 6.73	6.6 — 7.1	8.25	135
500	6.6	95	90	6.53 — 6.75	6.6 — 7.1	1.35	70
500	20.0	95	90	19.8 — 20.2	20.0 — 22.0	1.35	70

Note: Voltage rating shall be primary 5000V and secondary 600V.

Temperature rise

The temperature rise when a transformer is operated at rated load or when short circuited or open-circuited with rated current and frequency in the primary shall not exceed 55 deg. C as determined by the resistance method. Temperature rise shall be computed from the following formula.

$$\text{Temp. rise (C)} = \frac{(234.5 + X)\ R1 - RO}{RO}$$

Where X = Temperature (C) corresponding to cold resistance.

RO = Cold resistance R1 = Hot resistance

Insulation

The transformer shall be insulated for operation on a 5000 volt primary circuit.

Core and coil

The windings shall be completely insulated from each other and the core. Sharp corners and edges of the core and coil assembly shall be eliminated so that they should not cut the housing, if transformer is dropped or handled roughly.

Housing

The housing shall completely enclose the core and coil assembly with lead sealed into the housing in such a way as to produce a completely watertight unit. All exposed parts of the transformer assembly shall be capable of withstanding outdoor exposure, immersion in water, exposure to gas line and direct burial in earth containing large concentrations of oils, acids or alkalis.

The case material used must be a black cross-linked polychloroprene compound at a minimum. Materials that are of equivalent or better performance than cross-linked polychloroprene may

be substituted (e.g., thermoplastic vulcanizates (TPV) or thermoplastic elastomer (TPE).

The minimum strength requirements of housing material shall not be less than the following:

a) Tensile strength = 1200PSI (84 Kg/$cm^{2)}$

b) Tensile strength after 168 hours in an oven test at 69^0C — 71^0C = 1000PSI (70 KG/Cm2)

In the housing no portion of the case shall be less than 0.64 cm thick and it shall be free of cracks, blisters, holes etc. and all seems shall be closed by permanent bonds. The housing shall also be permanently bonded to the sheath of the primary and secondary leads. There shall be a minimum of internal air pocket so voids, and the assembly shall be sufficiently rugged to withstand rough handling.

The shape of the transformer may be either rectangular or circular. The overall dimensions of the transformer shall be such that it can fit easily inside a space defined as a cylinder of 20.3 cm. diameter by 25.4 cm. in height, inside dimensions. The case shall be designed so that transformer may be installed upright or lying on any side.

Marking

The following information shall be moulded on the surface of the transformer:

(a) Transformer rating: Primary amperes ……

Secondary amperes ……

(b) Watts …… Volts 5000 ……

(c) Transformer series to series / Year of manufacture ……

(d) Manufacturer's name or trade name ……

Transformer lead

The transformer shall be provided with a two conductor secondary lead and two single conductor primary leads. Lead connections may be of the solder or of the solder-less type. If solderless connections are used in jointing leads to the transformer windings, these shall be of a type designed for the application and properly applied. Care shall be exercised during moulding to ensure the proper clearance exists between these connections after the moulding operation has been completed. All three leads shall emerge from one end of the transformer. Spacing and arrangements are optional, provided all other requirements are complied with. The leads shall be securely fastened to the transformer in such a manner that carrying by a single lead will not loosen the electrical connections or effect the water seal. The length of all transformer leads shall be measured from the connector face to the junction of the transformer case.

One primary lead shall be equipped with a plug type connector; the other primary lead shall be

equipped with receptacle. The cable for the primary leads shall be 19 / 0.75mm (corona or ozone proof) single core cable, annealed tinned copper conductor insulated with composite insulation of HR-VIR and PCP sheathed or TPE cable suitable for 5000V operating voltage. Each primary lead shall extend not less than 60 cm, plus or minus

7.5cms beyond the housing including the cable connector.

The secondary lead shall be equipped with a receptacle. The cable for secondary lead shall be at least 37 / 0.30mm (corona or ozone proof) twin core cable, annealed tinned and filled and sheathed with special type of PCP or TPE insulated and sheathed cable suitable for 600 volt operating voltage. The cable shall extend 120cms plus or minus 7.5cm, beyond the housing, including the cable connector.

An approved watertight cap or plug shall be furnished on each mating part of each plug or receptacle for protection during shipment and installation from moisture and dirt.

Testing

Each transformer shall be examined visually for good workmanship.

Ratio test shall be carried out on each transformer for current ratio at rated frequency of current on the primary and rated load on the secondary. The secondary current of each transformer shall conform to the limits specified in table-1 specified above.

Test for voids: The maximum pressure which could be exerted directly with hands shall be applied to all parts of the transformer cases. Any evidence of voids beneath the surface of the case shall be cause for rejection.

Insulation resistance tests

For this test, the transformer shall be equipped with the pigtail leads. The joints where the connectors come together shall be tapped to prevent separation from handling. The transformer shall be subject to a continuous 20-cycle test. For each test cycle, the transformer shall be operated for a minimum of6 hours in air, at room temperature with rated current flowing in the primary and with the secondary open circuited. The transformer and its three connectors (with mating connectors installed) shall be immediately immersed in tap water, at room temperature and soaked for not less than12 hours.

The direct current insulation resistance shall be measured immediately after immersion (before 3 minutes have elapsed) and measured again after the soaking period.

The insulation resistance shall be measured after the voltage shown in Table 2 has applied for one minute between each coil and ground with the other coil grounded and

softening or swelling of the housing or any evidence of leakage or damage shall also because for rejection. Zero and maximum readings of the test instrument shall be periodically checked by immersing the high voltage lead in water alongside the transformer and by suspending it in air.

Table–2 DC Test Minimum Insulation Resistance

Coil	Voltage	Insulation Resistance in Mega Ohms			
		COLD	ELC*	HOT	ELC*
Secondary (600V)	5000V	750	6.7	300	17.0
Primary (5000V)	15000 V	2000	7.5	750	20.0

*** In Micro Amperes.**

Characteristics tests

The sample shall be tested to show that their electrical characteristics are as specified in Table 1. All corrections necessary to compensate for meter power consumption shall be applied. The transformer shall be operated in air at room temperature with rated load connected to the secondary until the transformer windings have reached normal operating temperature at which time the measurement will be taken.

Performance Tests:

The performance of the transformer shall comply with the requirements. All corrections necessary to compensate for meter power consumption shall be applied. The transformer shall be operated in air at room temperature with rated lead connected to the secondary until the transformer windings have reached normal operating temperature at which time the measurements will be taken.

Impact Test

The transformer shall be dropped twice from a height of two meters upon a smooth concrete surface hardware floor, once so it hits on the bottom of the case and once on the side of the case, location of hitting is so decided, where the most damage is likely to occur to the windings or due to core cutting into the housing. Lead rigidity shall be tested by securing (just below the connector) each lead one at a time in a clamp fastened to a support, elevated a distance in excess of the length of leads and then releasing the transformer for a free fall from clamp elevation. The lead clamp used shall be such as not to cause damage to the lead at the point of attachment. The test shall be conducted subsequent to the electrical characteristic test specified in Table 1. Following this impact test, the transformer shall again be subjected to the electrical characteristic tests. Any failure or a change of more than 1% in the results obtained in the electrical characteristic tests or evidence of damage to the housing & attached leads shall be cause for rejection.

The manufacturer shall possess test certificate for all the tests specified above for each capacity

of isolating transformer from an independent GOVT. LABAROTARY without that the item shall not be accepted. Test report shall not be later than five years

Production Testing:

The following test shall be made on each transformer after final assembly, and each transformer shall withstand the following tests successfully:

Each transformer shall be tested by the manufacturer for current ratio at rated frequency and current on the primary and rated load on the secondary. The secondary current of each transformer shall be within the limits specified inTable1.

Each transformer shall be subjected to one complete cycle of the test specified.

The maximum pressure, which can be exerted directly with the hands, shall be applied to all parts of the transformer housing. Any evidence of voids beneath the surface of the housing shall because for rejection.

Acceptance tests

The following test shall be carried out at the time of acceptance.

a) Visual examination for good workmanship.

b) **Ratio test:** Each transformer shall be tested by the manufacturer for current ratio at rated frequency & current on the primary and rated load on the secondary. The secondary current of each transformer shall be within the limits specified in table 1.

c) **Insulation test:** Transformer shall be subjected to one complete cycle of the test specified under insulation resistance test specified above.

d) **Test for voids:** The maximum pressure which can be exerted directly with the hands shall be applied to all parts of the transformer housing. Any evidence of voids beneath the surface of the housing shall be cause for rejection.

Samples for acceptance test

Sample should be taken from each lot of particular type of isolating transformer for ascertaining the conformity of the lot to the requirement of specifications. The number of samples to be selected and permissible number of defects shall be as given below:-

Scale of Sampling

All the isolating transformers of the same type manufactured using the same raw material under similar conditions of production shall be grouped together to constitute a lot.

The number of isolating transformers to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table given below:

SAMPLE SIZES AND ACCEPTANCE NUMBERS

LOT SIZE	SAMPLE ACCEPTANCE	SIZE NUMBER
(1)	**(2)**	**(3)**
Up to 50	8	0
51 to 100	13	0
101 to 150	20	1
151 to 300	32	1
301 to 500	50	2
501 to 1000	80	3
1001 and above	125	5

These samples shall be selected from the lot at random. Number of Tests and Criteria for Conformity

The isolating transformers, selected at random according to col 1 and 2 of Table above, shall be subjected to the acceptance tests as specified above. An isolating transformer failing to satisfy any of the acceptance tests shall be termed as defective. The lot shall be considered as conforming to the requirements, if the number of defectives found in the samples is less than or equal to the corresponding acceptance number; otherwise the lot shall be rejected.

Packing

Packing shall ensure full protection to the equipment against corrosion and deterioration or physical damage during handling and transportation by air, road or sea.

Each case shall be marked on the outside with the following details:

i. Name of manufacturer.

ii. Order Number

iii. Brief description of contents.

E) CI TRANSFORMER HOUSING BOX

The CI transformer housing box is used for housing the isolating transformer and installation of elevated type light fittings used in operational area for runway, taxiway, turning pad, approach threshold etc over its top.

Material	:	CI mould of foundry grade pig iron confirming to IS 224
Thickness	:	15 mm thick (average) on top surface and 10 mm thick (average) all round. Top surface should be smoothly machined to receive base plate of light fixture.
Height	:	450 mm
Outside diameter	:	330 mm
Opening on top	:	220 mm diameter
Holes for fixing light fitting base plate	:	6 nos. M-10 taped holes at hole centre of 260 mm
HOLES REQUIRED	:	1 or 2 Nos. of hole to receive 50 mm diameter 'B' class GI pipe as specified in BOQ & drawing. 1 No hole to receive 15 mm dia 'B' class GI pipe
OVERALL WEIGHT	:	(i) C.I. Box with 1 No. hole to receive 50 mm dia., G.I pipe - 42 Kg(Minimum) (ii) C.I. Box with 2 Nos. holes to receive 2 Nos. 50 mm dia., G.I pipe – 42 Kg.(Minimum)
EARTH TERMINAL	:	Two numbers holes tapped to receive M10X 30 mm SS bolts. Along with each CI box, 2 nos of M10X30 mm SS bolts with 4 nos SS nuts and SS washers shall also be supplied.

Note:

All other requirements as per the Drawing enclosed. The tenderer shall prepare the drawing for transformer housing boxes and shall get it approved from Engineer-in- charge before manufacturing.

Acceptance & Routine Test

The following tests shall be carried out as acceptance test

a) Visual inspection (Dimensional check & finish)

b) Weight of the CI box.

c) Checking with base plate of fitting (to be obtained by contractor from AAI) about matching of hole centres and threading to suit M-10 bolt.

d) Checking for earth terminals arrangement

Marking & Painting

Each CI box shall be suitably and clearly marked with manufacturer's name or trade mark or both. Each CI box shall be painted with 3 coats of anti-corrosive black paint on inside as well as outside.

Samples for acceptance test

Samples should be taken from each lot of CI boxes for ascertaining the conformity of the lot to the required of specifications. The number of samples to be selected and permissible number of defects shall be as given below:

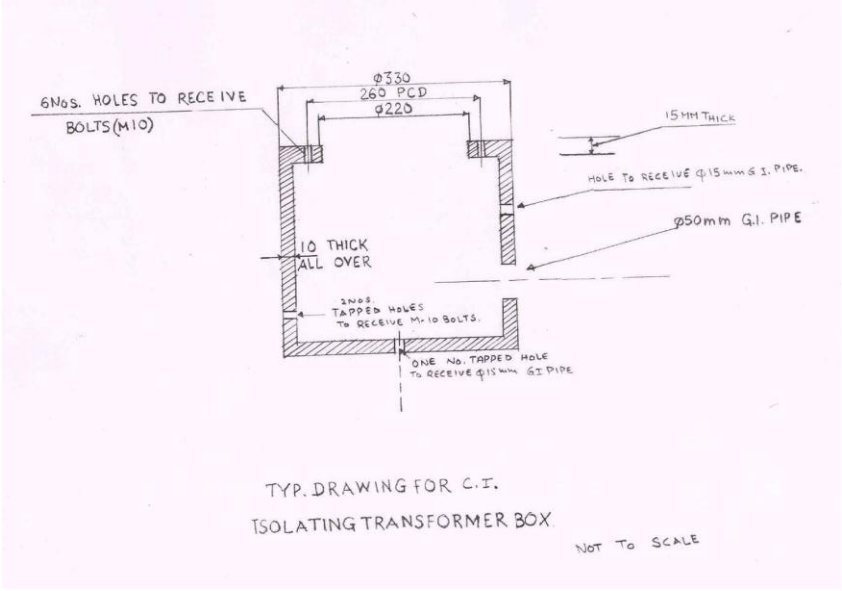
All the CI boxes of the same type manufactured using same raw material under similar conditions of production shall be grouped together to constitute a lot. The number of CI boxes to be selected from each lot shall be in accordance with Col 1 and 2 of the table give below:

Lot Size	Sample Size	Acceptance No.
(1)	(2)	(3)
Up to 50	8	0
51 to 100	13	0
101 to 150	20	1
151 to 300	32	1
301 to 500	50	2
501 to 1000	80	3

These samples shall be selected from the lot at random.

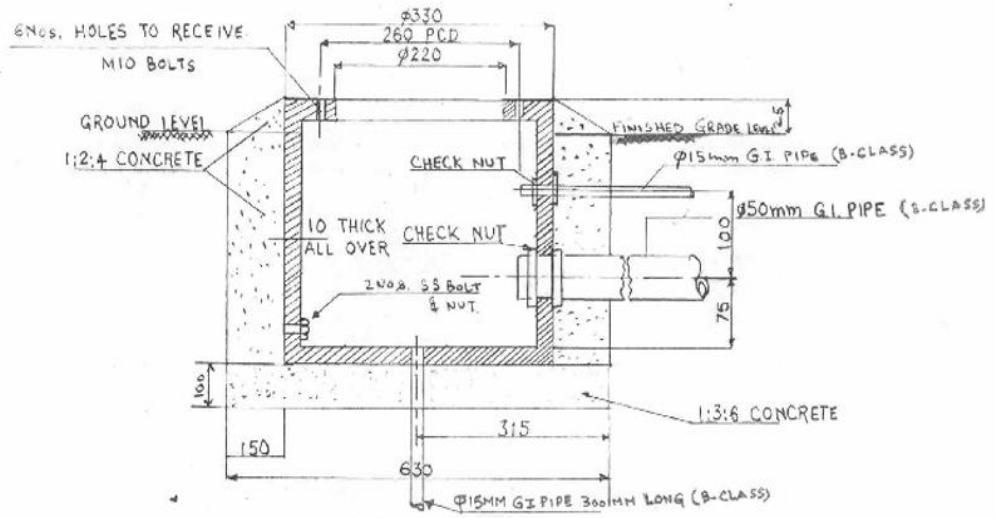
Number of tests and criteria for conformity

The CI boxes selected at random according to Col.1 and 2 of table above shall be subjected to acceptance tests as specified above. A CI box failing to satisfy any of the acceptance tests shall be termed as defective. The lot shall be considered as conforming to the requirements, if the number of defectives found in the samples is less than or equal to corresponding acceptance number, otherwise the lot shall be rejected.



TYP. DRAWING FOR C.I.
ISOLATING TRANSFORMER BOX

NOT TO SCALE



TYP. DRAWING FOR INSTALLATION OF
ISOLATING TRANSFORMER BOX.

NOT TO SCALE

F) SPECIFICATION FOR PLUG AND RECEPTACLE, CABLE CONNECTORS

SCOPE AND CLASSIFICATION.

Scope

This specification contains requirements for plugs and receptacles (cable connectors) to be used for underground cable connections, for power cables, isolation transformer leads, and light fixture leads for airport systems.

Classification

Cable connectors are classified by this specification into two types, two classes, and six styles of plugs and two types, two classes, and six styles of receptacles.

Type

Plugs and receptacles with the following electrical characteristics are covered by the specification:

Type I 1 conductor, 25 ampere, 5000 volt

Type II 2 conductor, 20 ampere, 600 volt

Class

Plugs and receptacles with the following attachment methods are covered by this specification:

Class A Factory molded to conductors Class B Field attached to conductors

Style

Plugs and receptacles with following styles of housing are covered by this specification:

Style 1 Plug, figure 1(a)

Style 2 Plug, figure 2(a)

Style 3 Plug, figure 3(a). & 3(c)

Style 4 Plug, figures 4(a), 4(b) & 4(c)

Style 5 Plug, figures 7(a), 7(b), & 7(c)

Style 6 Plug, figure 8

Style 7 Receptacle, figure 1(b)

Style 8 Receptacle, figure 1(c)

Style 9 Receptacle, figure 2(b)

Style 10 Receptacle, figures 3(b), & 3(d)

Style 11 Receptacle, figures 5(a), 5(b) & 5(c)

Style 12 Receptacle, figures 6(a), 6(b), & 6(c)

Equipment requirements. General

Plugs and receptacles (cable connectors) shall be fabricated in accordance with all specification requirements.

Environmental Requirements

The plugs and receptacles (cable connectors) shall be designed for continuous use within a temperature range of — 55° C (-67° F) to + 65° C (+149° F) while exposed to weather, submerged in water, or buried in the earth.

Performance Requirements.

Electrical Connection

The electrical rating of each connector shall not be less than 5000 V for type I connectors, or 600 V for type II connectors. The voltage drop across the contacts of a connected plug and receptacle shall not exceed 7.5 millivolts for the Type I connectors, and 6.0 millivolts for the Type II connectors.

Bonding Strength

The completed Class A connector assembly shall withstand a longitudinal pull of at least 30,000 psi (207 Mpa), 75 percent of an average tensile strength of 40,000 psi, (276 Mpa) for all wire sizes. Separation between the molded on connector and the cable shall not exceed 0.03 inches (0.8 mm).

Mechanical Connection

Each connected plug and receptacle shall withstand a static pull load of 10 pounds (44N) without showing evidence of separation. No damage shall occur to the mating components when the connected plug and receptacle are separated by a greater static pull load.

Seal

A watertight seal shall be provided between the mated plug and receptacle and between the rubber and metal parts of the plug and receptacle.

Fabrication and Materials. General

Each plug and receptacle (cable connector), type, class, and style shall conform to the dimensions and construction requirement shown on the applicable figures in Appendix I of this specification.

Housing

The connector housing shall be molded from natural and/or synthetic elastomeric materials serving both as insulation and sheath to fully enclose the pins of the plug and sockets of the receptacle. The housing material shall be suitable for direct earth burial, submergence in water, and capable of withstanding limited attack from chemicals, typically present on the airfield, including but not limited to, oil, de-icing fluids and/or gasoline. Material compounds used in connector housings shall not contain more than 25 pounds (11 kg) of carbon black per 100 pounds (45kg) of elastomer. Housings for Class A connectors shall be fabricated from materials capable of bonding to cable sheaths or conductor insulation, during the manufacturing process to provide a watertight bond.

Pins and Sockets

The pins and sockets shall conform to all dimensions and construction requirements indicated on the applicable figures in Appendix I of this specification. Pins and sockets shall be made of materials that contain at least 98 percent copper. The contact portion of the pin and socket shall be left "stock hard" and the crimping section, when necessary, fully annealed. The hardness transition shall be limited to the locking section of the pin and socket. The pin and socket shall be electroplated with tin or other suitable material to provide good electrical contact as required under electrical connection specified above. The sockets shall be spring loaded or slotted and spring loaded to ensure good electrical contact as required under electrical connection specified above and Class A sockets shall have a means that protects the sockets slots from filling with insulating compound during molding. The pin for the Style 3 connector shall be provided with a visual indication that verifies proper assembly position. Pins and sockets provided for Class B connectors shall have provisions for crimping to the cable conductors(s), and shall not exhibit damage after crimping.

Connector Assemblies. **Class A**

Pins and sockets shall be held perpendicular to the face of the block. Suitable electrical conductors shall be mechanically and electrically connected to the pin(s) or socket(s). The connector housing shall be molded as specified under housing. Primary connectors shall be molded to an electrical conductor having a voltage rating equal to or less than the specified voltage rating of the connector. Secondary connectors shall be molded to an electrical conductor having a voltage rating equal to or less than the specified voltage rating of the connector with the preferred being equal to the connector rating. A connector shall never be molded to an electrical conductor or cable having a higher voltage rating than the specification requirements for the connector. After molding, the space between the pins of Type II plugs shall not be less than 1/8 inch (3mm) when the pins are pinched together with a force of 6 pounds (27 N) applied 1/2 inch (12.7 mm) out from the face of the plug. Also, the space between the ends of the pin of the Type II plugs shall not be greater than 9/16 inch (14.3 mm) when the pins are pulled apart with a force of 6 pounds (27N) applied 1/2 inch (12.7 mm) out from the face of the plug. The force is applied to the pins

only. During testing for the above mentioned requirements the plug is to be held only to keep it from turning.

Class B Type I

Each receptacle shall be equipped with a disposable sleeve fitted into the receptacle's water seal to catch surplus silicone compound upon assembly. Each socket shall be equipped with a disposable pin fitted tightly into the pin end of the socket to prevent entry of silicon compound on assembly and to provide a visual indication of proper socket position after assembly. The pin design shall be such that proper internal dispersion of silicone compound in the assembly is assured. An adequate amount of silicone insulating compound shall be furnished with each connector to ensure filling all internal voids when the connector is assembled. Each housing shall be capped with a disposable shipping cap on the cable entrance end.

Type II

Connector assemblies shall be composed of two parts, an insert assembly and housing. Pins or sockets shall be held perpendicular to the face of each end of the molded insert assembly and fastened. After proper assembly, the space between the pins of the plug shall not be less than 1/8 inch (3 mm) when the pins are pinched together with a force of 6 pounds (27 N) applied 1/2 inch (12.7 mm) out from the face of the plug. Also, the space between the ends of the pin shall not be greater than 9/16 inch (14.3 mm) when the pins are pulled apart with a force of 6 pounds applied 1/2 inch (12.7 mm) out from the face of the plug. Inserts and housing shall be molded as specified in paragraph 'housing', and shall comply with the dimensions and styles shown on the applicable figures in Appendix I of this specification. When assembled the plug and receptacle assemblies shall provide a watertight seal to prevent moisture from entering the housing.

Marking

Each plug and receptacle shall be marked with manufacturer's identification and bold style number.

Caps

Caps shall be supplied with Class A connectors to protect plugs and receptacles prior to final connection. Caps shall be made of a plastic material compatible with the housing materials specified in paragraph 'housing'. When a series short circuiting plug type cap with internal jumpers is required for Type II receptacles, jumpers shall be connected to the proper pins. The mating dimensions shall be the same as the corresponding plug. The short circuiting cap shall be permanently marked with an "S".

Instructions

Installation instructions shall be furnished by the manufacturer with each Class B connector.

Equipment qualification requirements. **Type Test.**

The under mentioned type tests shall be carried out for initial approval of the item and shall be valid for maximum five years even if the design as per the original type tests is not changed. The plug and connector assembly shall be tested in accordance with the tests detailed below:

General

Assembled connectors, with conductors attached, shall be subjected to electrical and physical tests. Class B connectors shall be assembled in accordance with manufacturer's instructions to lengths of wire or cable, as appropriate, of at least 24 inches (0.6 m) for all tests. Six pairs of mated connectors shall be selected at random from a production run for each type of connector to be tested for approval. Each tested connector shall pass all qualification tests. Failure of any one of the connectors in any one of the qualification tests shall indicate failure of this product to comply with this specification unless otherwise noted in a particular test.

Dielectric Tests.

Plugs and Receptacles

Six test insert plugs made of nylon or equal material of suitable dielectric strength shall be provided for the test. These test plugs shall meet the mating dimensions of the corresponding standard plug intended for use with the receptacle being tested. Each plug shall be checked with "go" and "no go" ring gauges to ensure compliance with specified dimensions. Each connector receptacle under test shall be mated with one of the test plugs and allowed to soak for 24 hours in a tap water bath at room temperature, 20-25 degree C. At the end of the soaking period, with the receptacle still immersed, apply a test voltage of 4.7 kV dc for 5 minutes to Type II connectors and 15 kV dc to Type I connectors. One minute after the test voltage has been applied the minimum insulation resistance between the conductors and water, and between conductors measured with a 500-volt source shall be 25,000 mega ohms. The receptacles having passed this test are now used for testing the corresponding plugs in a like test.

Connector Assembly

After the conclusion of the test as above, each plug and receptacle being tested shall be mated and immersed in a tap water bath at room temperature, 20-25 ^{o}C. Immerse not more than 2 feet (0.6 m) of cable, 1 foot (0.3 m) of the plug and 1 foot (0.3 m) of the receptacle. While immersed, each connector assembly shall be manually flexed for 2 minutes and then left immersed for a minimum of 24 hours with its cable leads flexed and maintained 180° from its longitudinal axis. Measure insulation resistance between conductors of each connected assembly after the 24 hour soaking period. The resistance measurements shall be taken 1 minute after a test voltage of 4.7 kV dc has been applied for 5 minutes to Type II connectors and 15 kV dc to Type I connectors. The minimum resistance between conductors shall be 25,000 mega ohms. Heat the tap water to 65°C without removing the assemblies and maintain this temperature for at least 1 hour. Again measure the resistance between the conductor(s) and water, and between conductors with a

500-volt source. The minimum acceptable resistance after the heated soaking period shall be 10,000 mega ohms.

Bond Test

The molded bond between cable and Class A connector shall be subjected to a static longitudinal pull load of the magnitude specified in this specification under 'bonding strength'. When testing class A, Type II, connectors of any Style the two conductors shall be pulled as a single cable, not as individual conductors. The connector shall be held in a manner that does not impart a crimping or clamping action to the connector that would affect the pull test. The connector molding cavity, or a similarly shaped fixture, is acceptable for holding the connector. Separation between the molded on connector and the cable jacket or conductor insulation exceeding 0.03 inches shall be cause for rejection.

Mechanical Connection Test

Each plug and receptacle intended to be mated shall be connected together and subjected to the static pull load specified in this specification under 'mechanical connection'. Any evidence of separation of the connection shall be cause for rejection. Increasing load shall be applied to the connector assembly until separation occurs. No damage shall occur to the mating components when the connected plug and receptacle are separated by the greater static pull load.

Any evidence of damage to plugs, receptacles, conductors, and / or the connector bond shall be cause for rejection.

Electrical Connection Test

Voltage drop measurements shall be made across mated connectors while conducting rated current. Voltage drops in excess of those specified in this specification shall be cause for rejection. This test may be performed using unmolded contacts conducting rated current. This would permit the measurement to be made without damaging the molded connectors. This test shall be performed on the equivalent of six connectors (six contact pairs for Type I connectors and twelve contact pairs for Type II connectors).

Metal Bond Test

Class A assemblies shall have their connector plug and receptacle placed in water, with 20 psi air pressure applied from the free end of the cable, for a period of 10 minutes. No air bubbles shall be observed in the water.

Acceptance Tests

The following tests shall be carried out as acceptance test:

a) Dielectric test

b) connector assembly test

c) mechanical connection test

d) Electric connection test

Samples for acceptance test

Sample should be taken from each lot of particular type of plug and receptacle for ascertaining the conformity of the lot to the requirement of specifications. The number of samples to be selected and permissible number of defects shall be as given below:-

Scale of Sampling

All the plug and receptacle of the same type manufactured using the same raw material under similar conditions of production shall be grouped together to constitute a lot.

The number of plug and receptacle to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table given below:

SAMPLE SIZES AND ACCEPTANCE NUMBERS

LOT SIZE	SAMPLE ACCEPTANCE	SIZE NUMBER
(1)	(2)	(3)
Up to 50	8	0
51 to 100	13	0
101 to 150	20	1
151 to 300	32	1
301 to 500	50	2
501 to 1000	80	3
1001 and above	125	5

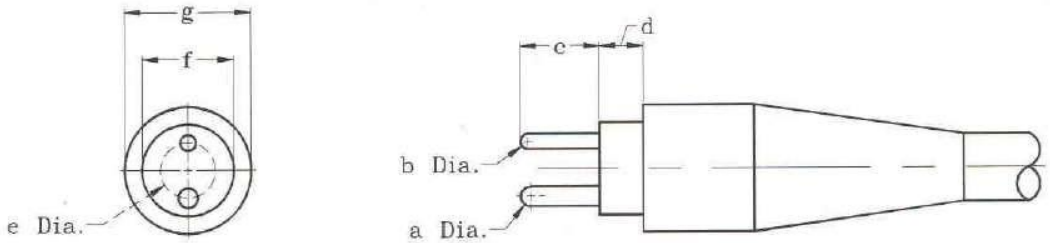
These samples shall be selected from the lot at random.

Number of Tests and Criteria for Conformity

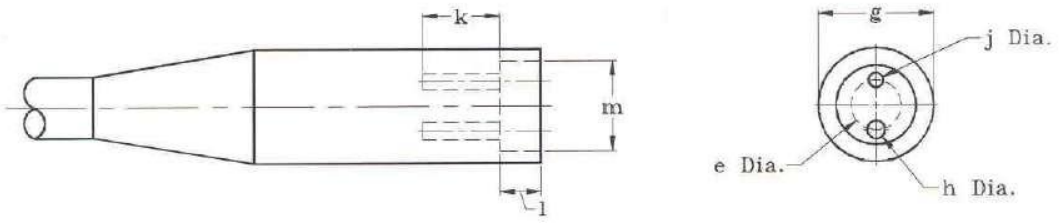
The plug and receptacle, selected at random according to col 1 and 2 of Table above, shall be subjected to the acceptance tests as specified above. A plug and receptacle failing to satisfy any of the acceptance tests shall be termed as defective. The lot shall be considered as conforming to the requirements, if the number of defectives found in the samples is less than or equal to the corresponding acceptance number; otherwise the lot shall be rejected.

Packaging

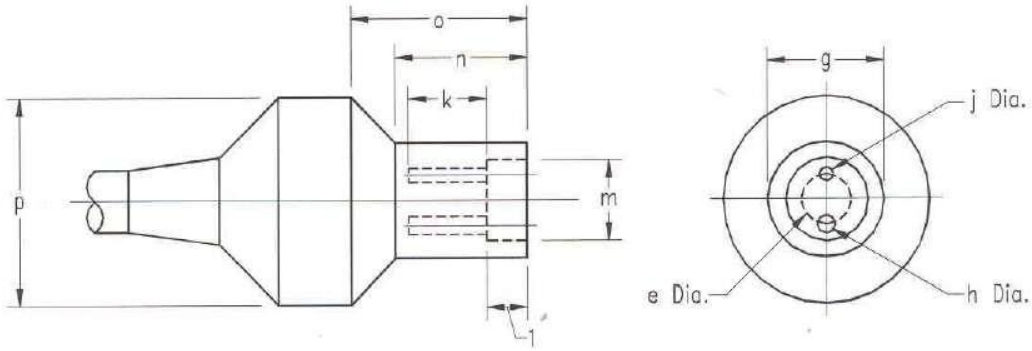
Packaging shall ensure full protection to the equipment against corrosion and deterioration or physical damage during handling and transportation by air, road, rail or sea. With the equipment a packaging list giving full details of the contents of the case including name of manufacturer, order number, brief description of contents etc shall be enclosed.



(a) PLUG - Class A, Type II, Style 1



(b) RECEPTACLE - Class A, Type II, Style 7



(c) RECEPTABLE - Class A, Type II, Style 8

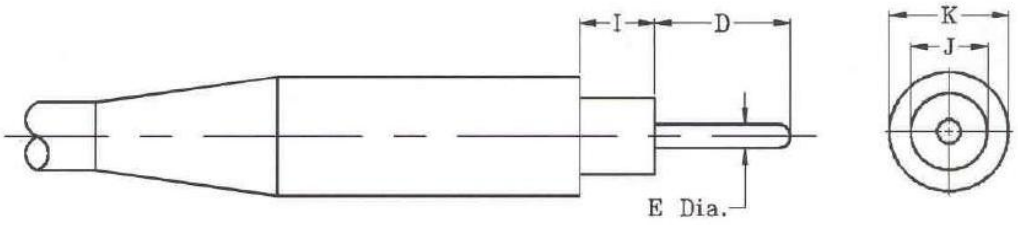
Note:
Dimensions are defined on figure 1A.

Figure 1 **Class A, Type II, Plugs and Receptacles** – Two Conductor, 20 Ampere, 600 Volts Between Contacts, 1500 Volts to ground

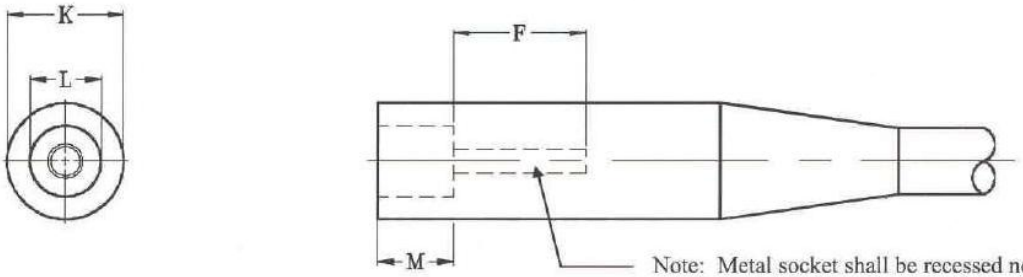
DIMENSION	INCHES	MILLIMETERS	REFERENCES
a	0.155 ± .001	3.937 ± 0.025	Connector
b	0.124 ± .001	3.150 ± 0.025	Connector
c	0.625 ± .015	15.875 ± 0.381	Plug pin
d	0.343 + .031, –.000	8.712 + 0.787, – .000	Plug
e	0.435 ± .010	11.049 ±. 0.254	Plug, Receptacle
f	0.725 + .020, – .000	18.415 + 0.508, – .000	Plug
g	1.000 + .000, –.031	25.40 + .000, – .787	Plug, Receptacle
h	0.1570 + .0010, –.0007	3.988 + 0.0254 – .018	Socket Diameter Before Splitting
j	0.1260 + .0010, –.0007	3.2004 + 0.0254 – .018	Receptacle.
k	0.641 Min.	16.28 Min	Depth Of Socket Includes .125" (.318 cm) Recess Below Inside Face Of Receptacle
l	0.358 + .000, –.015	9.093 + .000, – .381	Receptacle
m	0.694 ± .010	17.628 ± .254	Receptacle
n	1.125 ± .031	28.575 ± .787	Receptacle
o	1.500 ± .031	38.10 ± .787	Receptacle
p	1.750 ± .031	44.45 ± .787	Receptacle

FIGURE 1A. Class A and B, Plugs and Receptacles – Dimensions

3



(a) Plug – Class A, Type I, Style 2

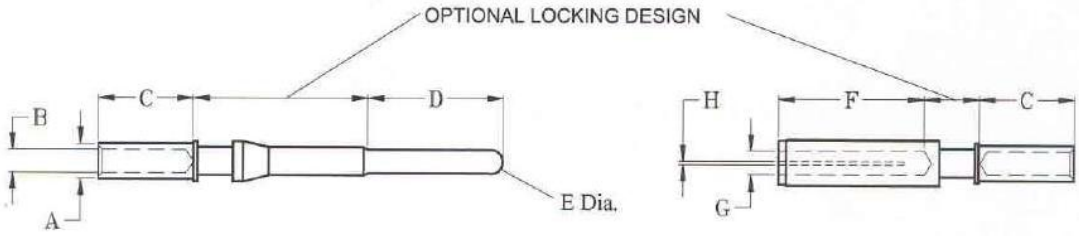


Note: Metal socket shall be recessed not more than 1/8 inch (3.175 mm) below inside face of receptacle and before splitting shall have an I.D. of .188 + .001, – .0007 inch (4.775 + 0.254 – 0.0178 mm).

(b) RECEPTACLE – Class A, Type I, Style 9

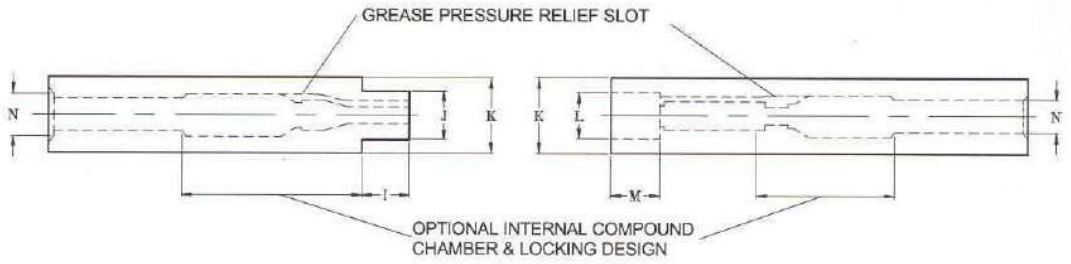
DIMENSION	INCHES	MILLIMETERS
D	1.062 ± .015	26.975 ± .381
E	0.186 ± .001	4.7244 ± .0254
F	1.080 Min.	27.432 Min.
I	0.593 + .015, – .000	15.062 + .381, – .000
J	0.604 + .010, – .000	15.342 + .254, – .000
K	0.937 + .000, – .031	23.800 + .000, – .787
L	0.573 ± .010	14.554 ± .254
M	0.608 + .000, – .015	15.443 + .000, –.381

FIGURE 2. **Class A, Type I, Plugs and Receptacles** – Single Conductor, 25 Ampere, 5000 Volts to Ground



(a) PIN – Style 3, Plug

(b) SOCKET – Style 10, Receptacle



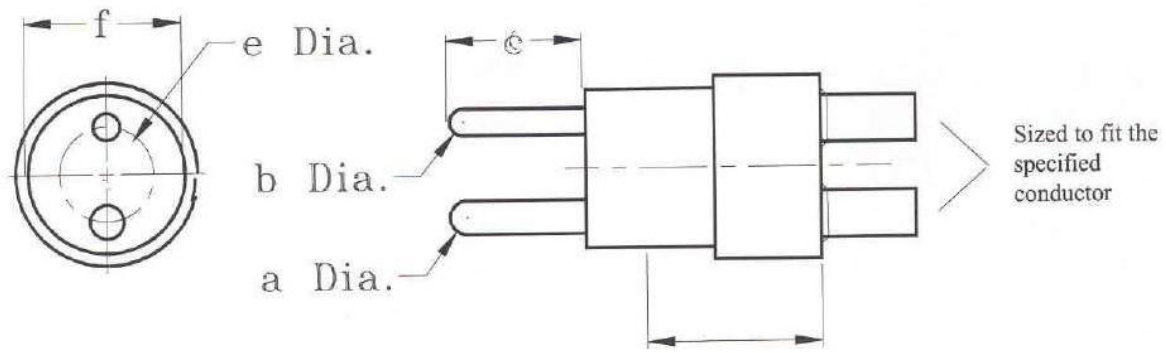
(c) PLUG – Class B, Type I, Style 3

(d) RECEPTACLE – Class B, Type I, Style 10

DIMENSION	INCHES	MILLIMETERS	REFERENCE
A, B, C	Dimensioned to provide a compression fitting for the specified cable size		
D	1.062 ± .015	26.975 ± .381	Pin
E	0.186 ± .001	4.7244 ± .0254	Pin
F	1.080 Min.	27.432 Min.	Depth of socket includes .125" (3.175 mm) recess below inside face of the receptacle
G	0.188 + .001, – .0007	4.7752 + .0254 – 0.0178	Socket (Before splitting)
H	0.025 ±.010	0.635 ± .254	Socket (minimum of 2 saw slots) if req.
I	0.593 + .015, –.000	15.062 + .381, – .000	Plug
J	0.604 + .010, –.000	15.342 + .254, – .000	Plug
K	0.937 + .000, – .031	23.800 + .000, – .787	Plug, Receptacle (Note : K dimension may vary except within 1" (25.4 mm)of the mating ends measured from the connector tip)
L	0.573 ± .010	14.554 ± .254	Receptacle
M	0.608 + .000, – .015	15.443 + .000, – .381	Receptacle
N	Dimensioned to provide a waterproof seal with the cable insulation		

FIGURE 3. **Class B. Type I, Style 3, Plugs and Class B, Style 10, Receptacle** – Single Conductor, 5000 Volts, 25 Ampere

5



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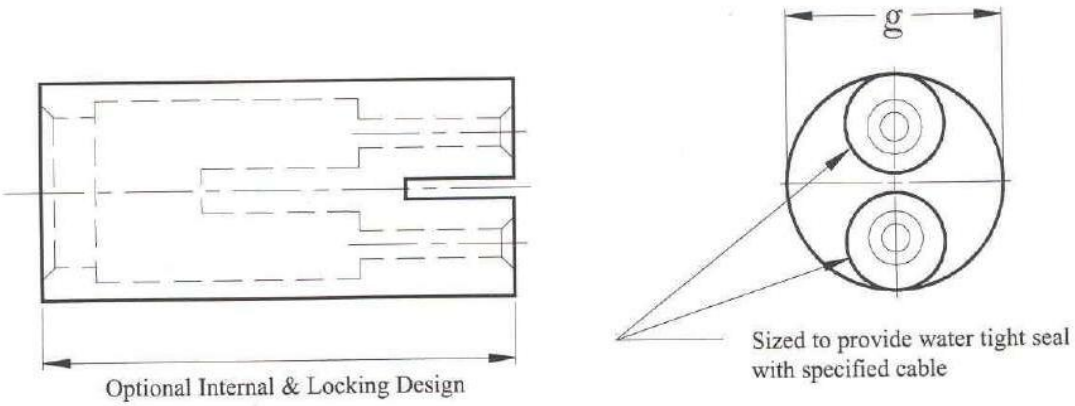
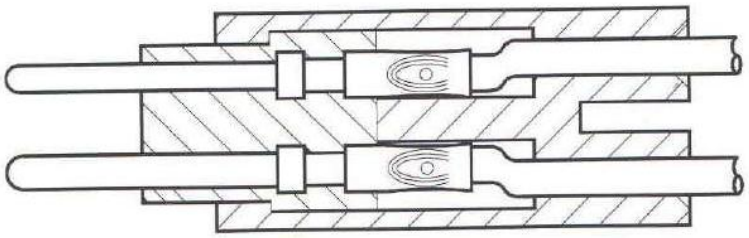


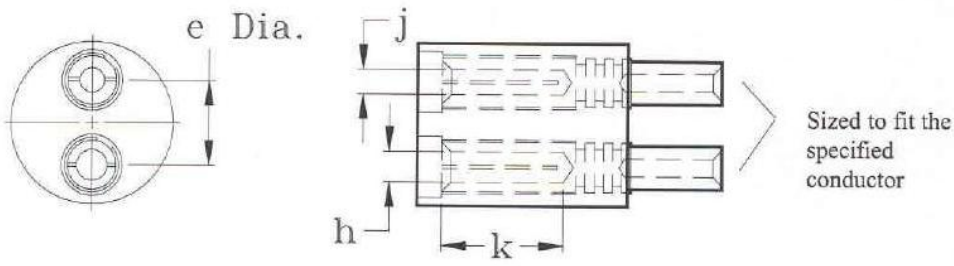
(b) HOUSING



(c) PLUG, a & b Assembled, Style 4

Note:
Dimensions are defined on Figure 1A.

FIGURE 4. **Class B, Type II, Style 4, Plug** - Two Conductor, 20 Ampere, 600 Volts Between Contacts, 1500 Volts to Ground



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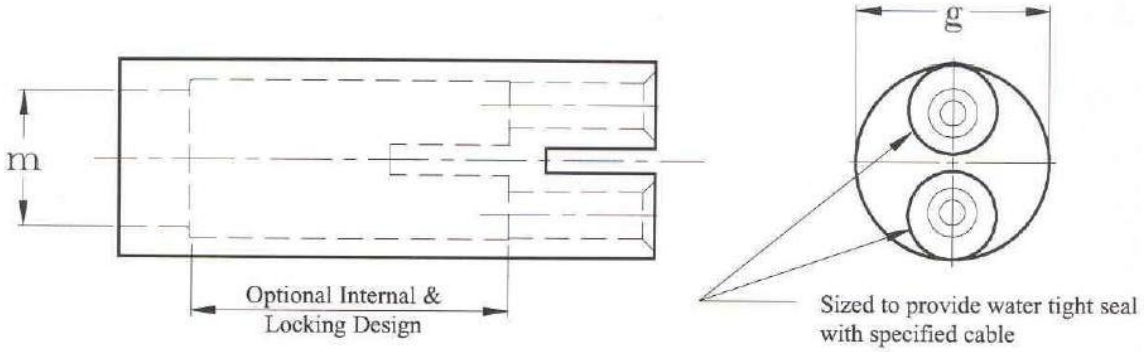
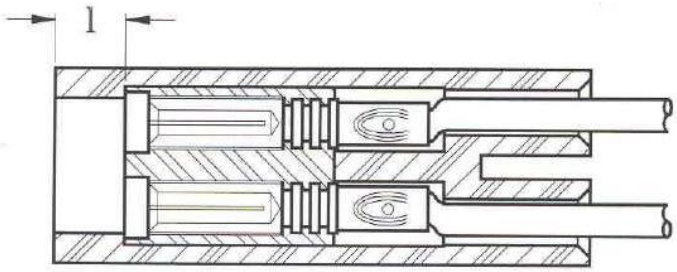


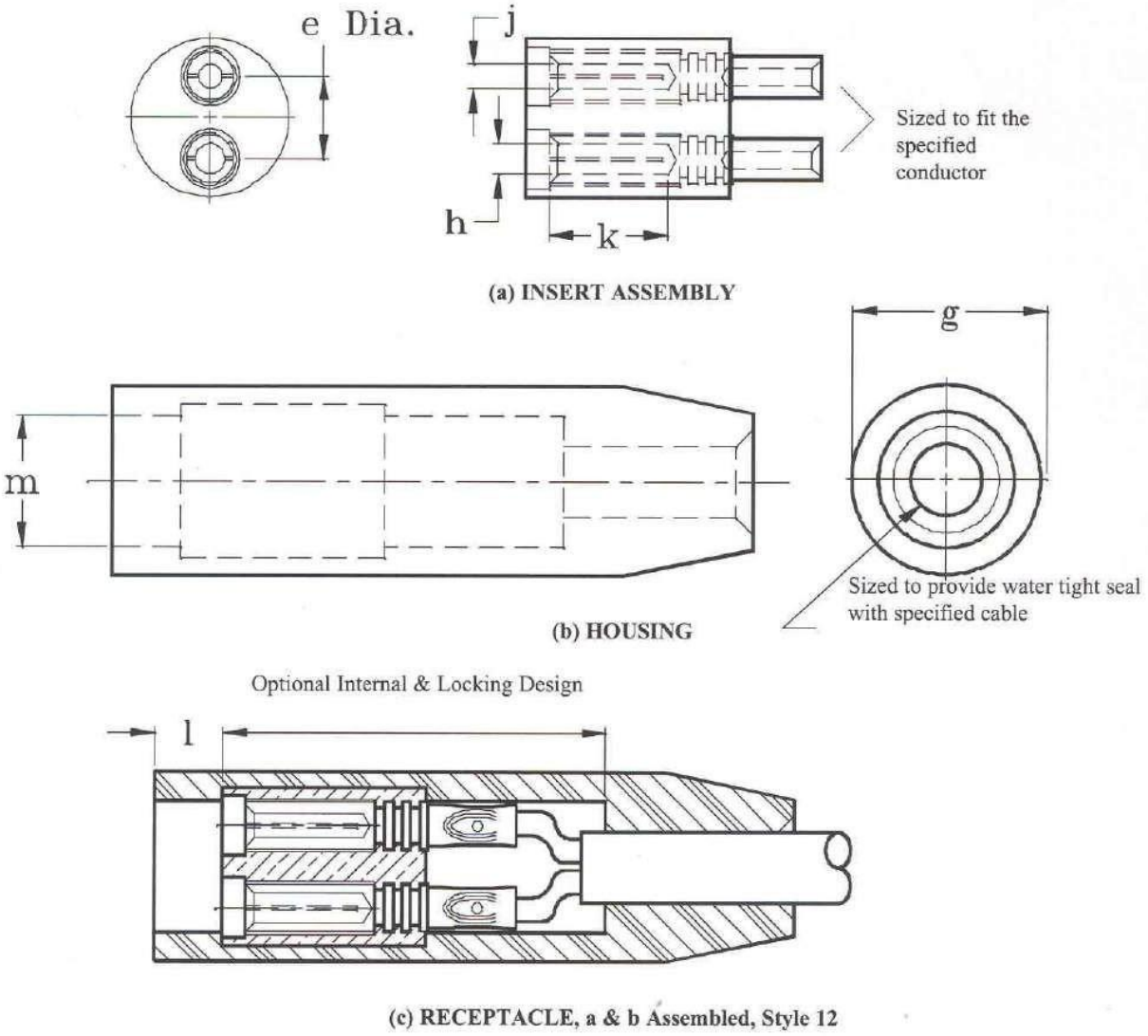
(b) HOUSING



(c) RECEPTACLE, a & b Assembled, Style 11

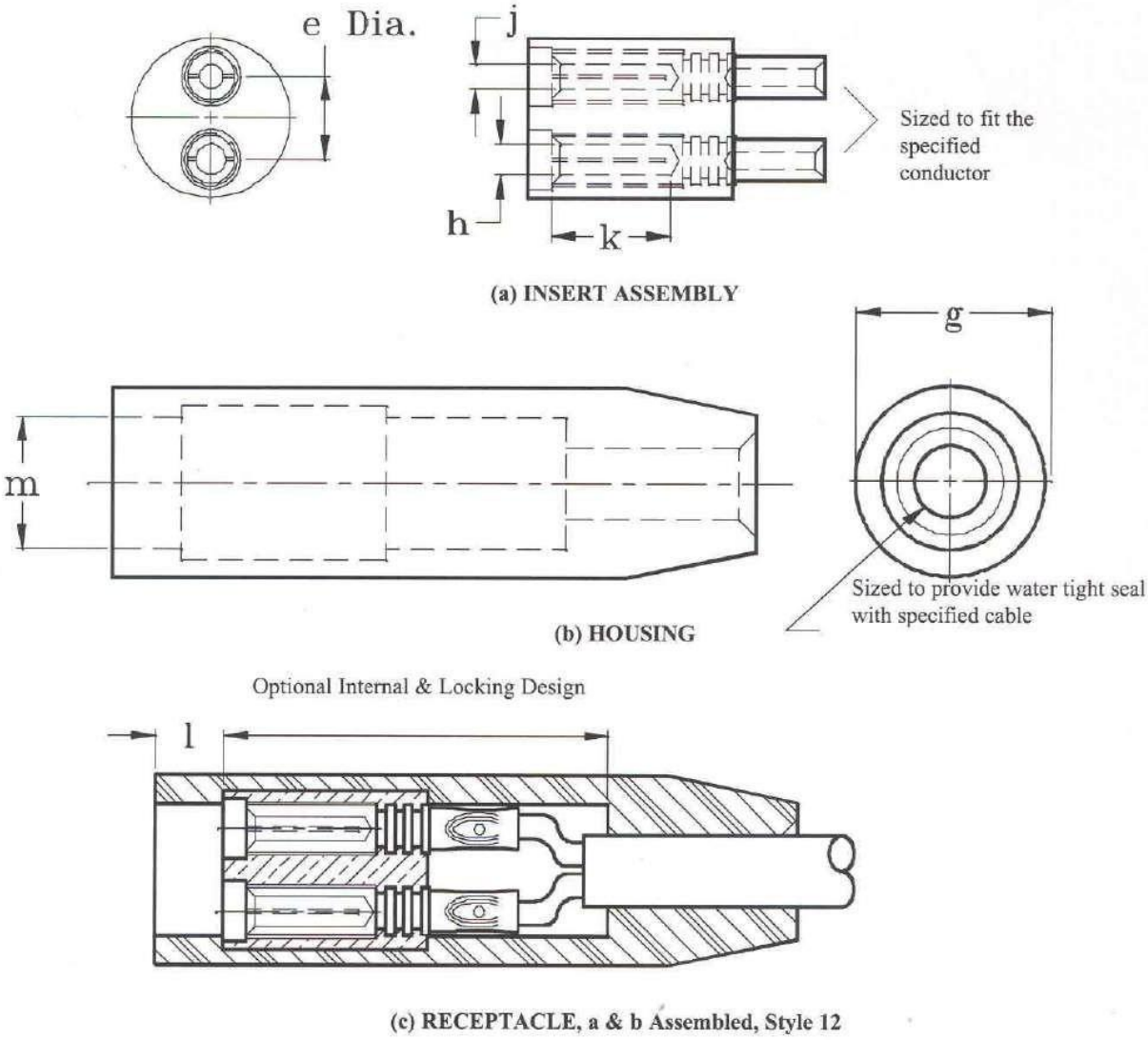
Note:
Dimensions are defined on Figure 1A.

FIGURE 5. **Class B, Type II, Style 11, Receptacle** - Two Conductor, 20 Ampere, 600 Volts Between Contacts, 1500 Volts to Ground



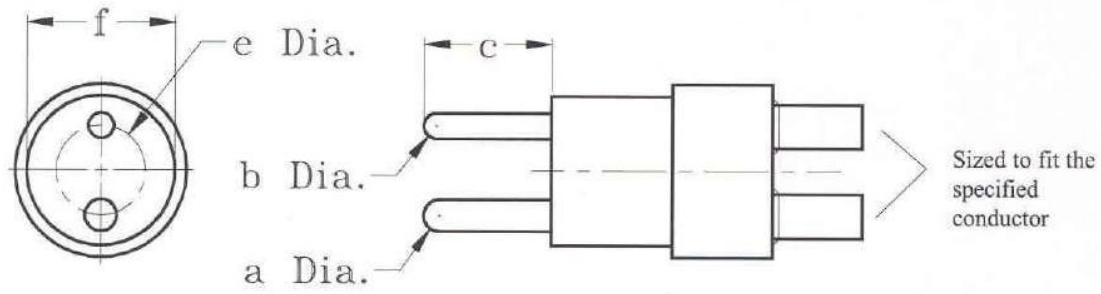
Note:
Dimensions are defined on Figure 1A.

FIGURE 6. **Class B, Type II, Style 12, Receptacle** - Single Conductor, 20 Ampere, 600 Volts Between Contacts 1500 Volts to Ground

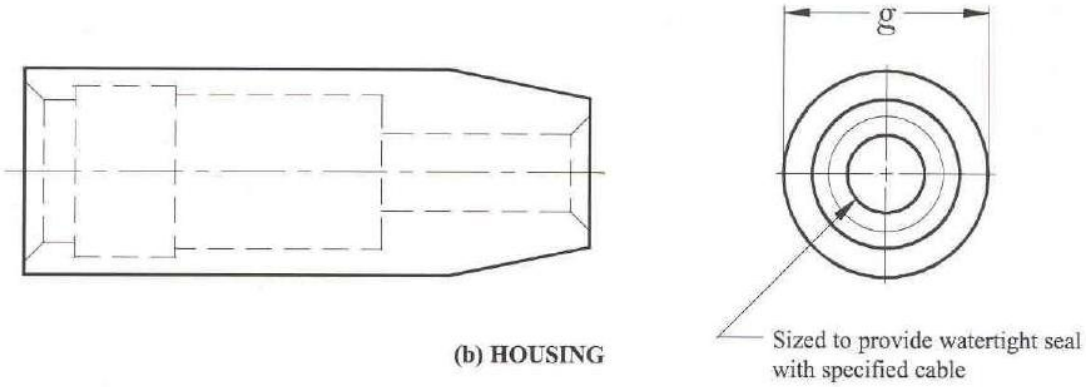


Note:
Dimensions are defined on Figure 1A.

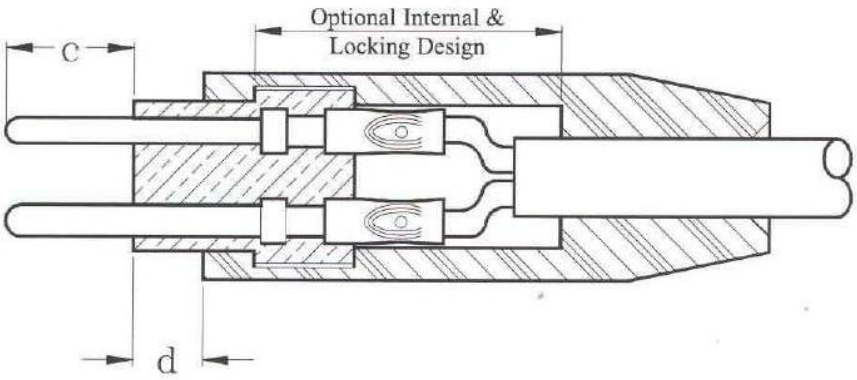
FIGURE 6. **Class B, Type II, Style 12, Receptacle** - Single Conductor, 20 Ampere, 600 Volts Between Contacts 1500 Volts to Ground



(a) INSERT ASSEMBLY



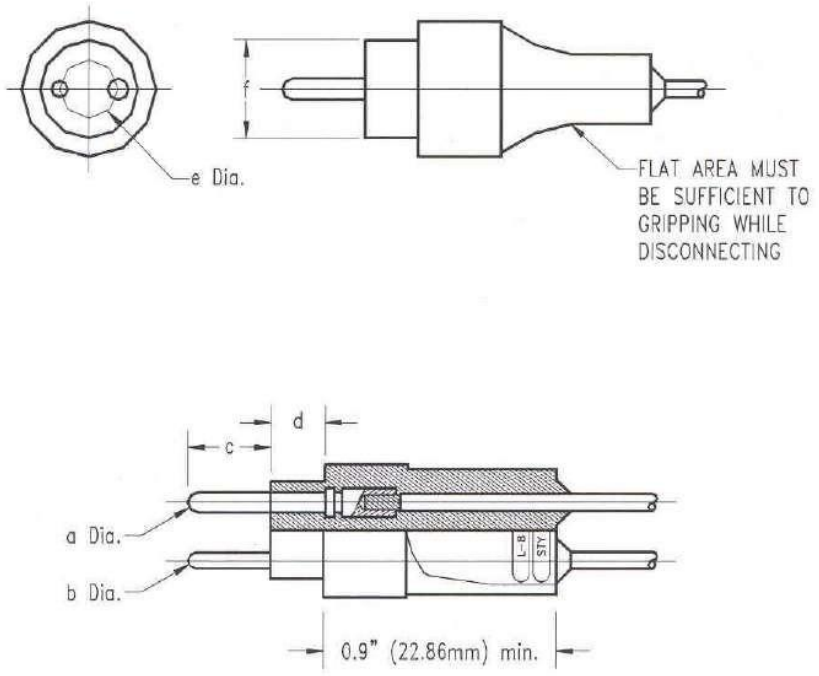
(b) HOUSING



(c) PLUG, a&b Assembled, Style 5

Note:
Dimensions are defined on Figure 1A.

FIGURE 7. **Class B, Type II, Style 5, Plug** - Single Conductor, 20 Ampere, 600 Volts Between Contacts, 1500 Volts to Ground



Note:
Dimensions are defined on Figure 1A.

FIGURE 8. **Class A, Type II, Style 6, Plug** - Two Conductor, 20 Ampere, 600 Volts Between Contacts, 1500 Volts to Ground

G) Technical Parameters of UPS

S.NO.	PARTICULARS		PROPOSED STANDARDS
1	**ENVIRONMENTAL:**		
1.1	Operating Temperature	:	0 to 40 Deg. C
1.2	Maximum Temperature	:	40 Deg. C
1.3	Storage Temperature	:	(-25 to 70) Deg. C
1.4	Relative Humidity	:	95%, Non-condensing
1.5	Altitude	:	Upto 1000 mtrs. MSL (Above 1000 Mtr. Deration factor @ 1.5% at every 100 mtrs.)
2	**INPUT**		
2.1	Standard Voltage	:	380/400/415V. Three phase
2.2	Voltage tolerance	:	+/- 15% at 400 V
2.3	Frequency	:	50Hz
2.4	Frequency tolerance	:	+/- 10% at 50 Hz (Without UPS tripping)
2.5	Rectifier Type (Inverter Technology)	:	IGBT Three level PWM Design
2.6	Power Walk-in	:	20-100 % in 45 Secs
2.7	Power factor at rated load	:	≥ 0.99
2.8	Input THDi at rated load	:	< 3%
3	**OUTPUT**		
3.1	Output rating	:	As per specifications.
3.2	Voltage	:	3 Phase
3.3	Frequency	:	50 Hz
3.4	Voltage stability-steady state	:	+/- 0.5- 1% typical
3.5	Overload	:	110% & for 60 mins. 125% for 10 mins. 150% for 1 min.
3.6	Non-linear load permissible	:	Yes
3.7	Voltage stability-transient state with	:	+/- 5%

	100% load change		
3.8	Frequency stability	:	50 Hz +/- 0.25 Hz
3.9	Crest Factor	:	3:1 (Minimum)
3.10	Output voltage distortion with a. Linear load (100%) b. Non-Linear Load (100%)	:	 a. < 1% b. < 5%
3.11	Transfer time, inverter mains Transfer & vice-versa with a. Inverter synchronized	:	0 m sec
3.12	Power factor	:	≥ 0.90
3.13	Overall Efficiency at rated load (ECO mode efficiency)	:	≥ 95% (ECO mode ≥ 98%)
3.14	Heat dissipation @ 100% load at nominal PF & charged batteries	:	As per OEM Standards
3.15	Heat dissipation @ 100% load in ECO mode at nominal PF & charged batteries	:	As per OEM Standards
4	**DC CHARACTERISTICS**		
4.1	Voltage Links of inverter operations	:	As per OEM standards
4.2	a. Float charge voltage b. End of Battery Voltage c. Absolute maximum voltage on manual charge	:	2.25/ cell1.75/ cell1.75/ cell
4.3	Voltage stability of the rectifier	:	+/- 1%
4.4	Ripple Voltage (with battery disconnected)	:	< 2%
4.5	Battery Ripple current	:	< 0.5%
4.6	Battery charging cycle	:	Boost/float charging with Current limit and boost time limiter
4.7	Max boost charge duration	:	1-1.5 hours in settable steps

4.8	Battery Isolation	:	Through battery circuit breaker (one for each module) with over Current Short circuit and under voltage protection)
5	**MIMIC Display**		
5.1	Mains available/ Rectifier operative	:	Yes
5.2	Battery Voltage	:	Yes
5.3	Bypass Supply	:	Yes
5.4	Inverter Output	:	Yes
5.5	Load on bypass	:	Yes
5.6	Load on inverter	:	Yes
6	**ALARMS (Through LC Display)**		
6.1	Inverter Off/ failed	:	Yes
6.2	Rectifier Off/ failed	:	Yes
6.3	Emergency stop	:	Yes
6.4	Over Temperature	:	Yes
6.5	Overload	:	110% & for 60 mins. 125% for 10 mins. 150% for 1 min.
6.6	Battery Circuit Breaker open	:	Yes
6.7	Output Circuit Breaker open	:	Yes
6.8	Input Circuit Breaker open	:	Yes
7	**WARNING DISPLAY (Through LC Display)**		
7.1	UPS on maintenance bypass	:	Yes
7.2	Inverter Unsynchronized	:	Yes
7.3	Battery on load	:	Yes
7.4	Mains failure	:	Yes
7.5	Load on bypass	:	Yes
8	**CONTROL SWITCHES &**		

	MONITERING		
8.1	To Select and monitor		
a)	Voltage (i/p, o/p, bypass)	:	Yes
b)	Current (i/p, o/p, bypass)	:	Yes
c)	Frequency (i/p, o/p, bypass)	:	Yes
d)	Load (kw, current, kva)	:	Yes
e)	Frequency (i/p, o/p, bypass)	:	Yes
f)	Battery voltage	:	Yes
g)	Battery charge/display current	:	Yes
8.2	Alarm reset switch	:	Yes
8.3	Inverter OFF Switch	:	Yes
8.4	Inverter on switch	:	Yes
8.5	Emergency stop switch	:	Yes
8.6	Static By-pass	:	Yes
8.7	Manual By-pass	:	Yes
9	**PROTECTION**		
9.1	Input under voltage	:	Yes
9.2	Input over voltage	:	Yes
9.3	Output under voltage	:	Yes
9.4	Output over voltage	:	Yes
9.5	Phase rotation correction	:	Yes
9.6	Loss of input power	:	Yes
9.7	Output overload	:	Yes
9.8	Galvanic isolation Transformer at output	:	Yes
9.9	Back feed protection	:	Yes
9.10	Protection against surges	:	Yes

9.11	Battery circuit breaker (BCB) for automatic isolation on battery line in case of battery under voltage and over current conditions.	:	Yes
9.12	Fully rated static switch in inverter output.	:	Yes
9.13	RS 232 / RS 485 Serial Port Computer Compatibility.	:	Yes
9.14	Network monitoring (SNMP)	:	Yes
9.15	External dry contacts		Yes
9.16	Microprocessor based self-diagnostics and monitoring	:	Yes
9.17	Isolators provided for isolating input & output.	:	Yes
9.18	For 1/2/3 phase UPS, the output voltage is genuinely generated directly from the inverter itself.	:	Yes
9.19	Fuse line Protection for input.	:	Yes
9.20	Protection against over temperature	:	Yes
10	**ENCLOSURE**		
	The enclosure shall be built in compliance with IP 20 Class of insulation : Class II	:	Yes
11	**CABINET FINISH**		
	Painting : Color	:	Siemens Gray/(RAL 9005)/RAL 7021

12	**CABLE ENTRY**		
	Top / Bottom	:	Yes
13	**BATTERY CABINET**		
	Battery shall have separate enclosure with proper staggering arrangement and painted with same colour of UPS cabinet.	:	Yes
14	Power Backup		Min 30 Minutes
15	Charging System		Float & Boost
16	Acoustic Noise		<65 dB @ 1 meter
17	**CERTIFICATION**		
	IEC- 62040-1	:	Yes
	IEC- 62040-2	:	Yes
	IEC- 62040-3	:	Yes
	IS : 16242-1	:	Yes
18	UPS topology	:	Double conversion (Stand alone/parallel)

Approval of equipment/ materials/ components:

Followings shall be part of the installation work:

- ✓ Formal approval of model of UPS offered shall be taken prior to call of inspection from EIC. Agency shall submit the necessary technical drawings, calculations compliance of tendered technical specification in order to receive formal approval of model of UPS/ batteries/ cables.
- ✓ Approval of GA drawing and finalization of location of installation of UPS in co-ordination with AAI.

Installation, Testing & Commissioning:

- ✓ Upon delivery of UPS and readiness of site shifting of the units from place of storage to place of installation.
- ✓ Unpacking.
- ✓ Verification for transit damages/ availability of all items including accessories, instruction manuals, drawings, test reports, etc. And take necessary action

wherever needed.

- ✓ Assembling of different sections of UPS, battery, battery cabinets.
- ✓ Positioning of UPS as per site requirement/ as per drawings.
- ✓ Alignment checks.
- ✓ Grouting/ securing to the floor/ bare channels etc., for stable installation.
- ✓ Undertaking all related minor civil works, mechanical works like chipping, grinding, plastering, welding, drilling etc.
- ✓ Making minor additions/ alterations as per the requirement for satisfactory installation.
- ✓ Touching up of damaged painted portion.
- ✓ Earthing of unit.
- ✓ Making interconnection with other equipment/ system where necessary.
- ✓ Connecting and ensuring efficient termination of cable as applicable using proper sizes cable lugs, glands and appropriate sizes of GI/ zinc passivity hardware with spring washer & plate washers.
- ✓ Ensuring proper tightness of all joints & connections.
- ✓ Providing proper supporting / protection arrangement to the cables/ units etc. To avoid under stress on the termination.
- ✓ Providing required instruction/ information/ caution/ name plates for easy operation and maintenance.
- ✓ Performing all pre commissioning checks and proper functioning of all required units.

TESTS

a) Factory tests:

Factory acceptance (FAT) test to be conducted as minimum but not limited to:

i. Light load test.

ii. AC input failure test

iii. Full load test

iv. UPS efficiency test

v. Unbalanced load test

vi. Balanced load test

vii. Overload capability test

viii. Short circuit test

ix. Harmonic components measurement.

x. Any other check as per OEM recommendation.

b) Type test

Bidder shall submit the following type test report along with final acceptance report.

i. Battery as per IS-1652 or as per latest amendment

ii. IP degree

iii. Type test of UPS as per IEC 62040-3 or as per latest amendment

iv. Calibration certificate of measuring instruments.

v. Routine test reports as per IEC 62040-Part-3.

c) Site test

i. Full load test shall be demonstrated with the available load with CCR's

ii. Battery backup test during mains failure condition

iii. Actual load condition test.

MINIMUM TESTS TO BE CHECKED DURING FACTORY ACCEPTANCE TEST OF UPS

S. No.	Description of Test	Test Method / Procedure	Acceptance Criteria (as per CPWD / IS)	Measured Value	Pass /Fail	Remarks
1	Physical & Visual Inspection	Inspect enclosure, labels, wiring, nameplates,	No physical damage; Correct rating;			
2	Insulation Resistance Test	IR test at 500V/1000V as applicable	> 1 MΩ or as per OEM			
3	Functional Test	Power ON UPS; run self-test; check inverter, bypass, alarms	All modules operate normally; No abnormal alarms			
4	Input Supply Voltage & frequency Check	Measure using calibrated meter	Within specified tolerance (±10% V, ±3% F)			
5	Output Voltage (No Load)	Measure output phase - neutral/phase-phase	Within ±1-2% of rated			
6	Load Test - 25% Load	Apply resistive load, record V/F/Waveform	Till thermal steady state or as per ender specification			
7	Load Test - 50% Load	Apply 50% resistive load	Till thermal steady state or as per tender specification			
8	Load Test - 100% Load	Apply full load using load bank	Till thermal steady state or as per tender specification			
9	Overload Test	110%-125% for 10 Min 126%-150% for 1 Min	UPS shall withstand 110%- 125% for 10 min & 126%- 150% for 1 Min			

10	Unbalanced Load Test	Apply unbalance load up to 30-60 minutes as per tender requirement	Voltage Within ±2% to ±3% of rated value			
11	Voltage Regulation Test	Vary load from 0-100%	Regulation within ±1%			
12	Output Frequency Stability	Measure frequency at all load levels	±0.1 Hz inverter mode			
13	Output THD (Linear Load)	Use power analyser	As per tender specification			
14	Efficiency Test	Measure Pin & Pout at rated load	As per tender specification			
15	Power Factor (Input/Output)	Measure using analyser	As per tender specification			

Note : The above test parameters are minimum, however any other test may also be consider for FAT as per requirement.

H) OCTAGONAL STREET LIGHT POLES & BRACKETS

Construction:

The octagonal pole shall be designed to withstand the wind speed applicable as per IS 875 (Part 3). The max stress at wind speed as per above IS shall not exceed 80% of the strength of steel. The details of top loading i.e. weight and area of luminaries are to be worked out based on this consideration. Max deflection of the pole shall meet the requirement of relevant IS with up to date amendments.

The pole shaft shall have octagonal cross section and shall continuously taper with aesthetically pleasing appearance. The pole shall be manufactured in single piece construction from 3mm thick high tensile steel sheet. The pole shaft shall be continuously tapered with single longitudinal welding. There should not be any circumferential welding.

The steel used in the manufacturing of the pole shaft, base flange etc. shall be suitable for such type of pole.

The pole shall be hot dip galvanized after fabrication, internally and externally in accordance with relevant IS with up to date amendments. The average coating thickness of galvanization shall not be less than 65 micron. Hot dip galvanizing shall be done in single dip operation.

A rigid flange plate of suitable thickness with provision for fixing minimum 4nos. of foundation bolts shall be provided. This base plate shall be fillet welded to the pole shaft from inside and outside.

The octagonal pole shall have door opening of suitable length at appropriate elevation from the base plate. The door shall be flush, vandal resistance and shall be weather proof to ensure safety of inside connections. The door shall be flush with the exterior surface and shall have suitable locking arrangement. Suitable earth stud(s) shall be provided for earthing the poles.

Required door reinforcement shall be provided to compensate for loss in section. A terminal plate made of 5 mm thick Bakelite sheet with 32 A heavy duty connector/terminal studs (suitable for loop in loop out connection of upto 2 nos. armoured cables of size up to 4 C x 10 sq.mm or as specified in schedule of quantities) and 1 no. 2 A DP MCB (or as specified in schedule of quantities) for ON / OFF operation of the luminaries shall be provided inside the door.

Octagonal Pole shall be of flanged type to be fixed on the foundation bolts. Material for octagonal pole shall be as per BSEN 10025 grade S355Jo. Exposed portion of foundation bolts shall be hot dip galvanized. 2 no. Earthing stud for connecting earth wire shall also

be provided opposite side of poles.

BRACKET FOR OCTAGONAL POLE

The bracket shall be suitable for installation of LED luminarie of required wattage (as specified in schedule of quantities) so as to achieve that specified lux level. The brackets shall have a suitable tilt angle and shall be galvanized internally and externally by hot dip galvanizing process.

The octagonal poles and brackets should be from same manufacturer to ensure proper matching and alignment of the pole and bracket.

SPECIFICATION FOR INSTALLATION OF POLES

(i) FOUNDATION

a) Design & Approval:

The foundation shall be designed to withstand the wind velocity applicable as per relevant IS and maintaining the maximum deflection of the pole as specified with bracket & fixtures within limits of specified standard. Foundation for the pole shall be made as per the design of manufacturer & should be suitable for site.

b) Cable Guard pipe:

50 mm dia. ISI marked DWC HDPE pipe including bending / coupling as required shall be provided for laying of loop-in loop-out cables in soil / concrete for easy laying & relaying of cable without any change to the CC work. The end of the pipe shall be sealed after cable is laid & tested. Separate pipe will be used for laying of separate cables.

c) Wiring to Light Fixtures:

Each street light fixture shall be wired from SP MCB provided on loop-in-loop-out box of pole by means of a separate flexible unarmored 3 core, 2.5 sq. mm, copper conductor, PVC insulated cable.

(ii) Lux Level Measurement

Before taking up the work, the contractor shall furnish the typical lux level calculation sheets for the given fixtures, type of fixture, pole height & bracket mentioned in the schedule of work for approval of the Engineer In-charge.

On completion of work the contractor shall demonstrate & furnish the same as final lux level of typical areas and submitted for acceptance of Engineer In-charge.

(iii) Pre-Commissioning and Commissioning Test of Street light

a) Check erection and alignment of poles, bracket and fixtures.

b) Incoming and outgoing cables are brought with ample clearance.

c) Terminal plate is tightly held to pole / mast etc.

d) Terminal connections of incoming and outgoing wires / cables are O. K.

e) Meggar of incoming and outgoing cable and wire going to fixtures etc.

f) Pole junction box covers are water tight and lockable.

g) Foundations are firm and approved by competent authority.

h) Electrical load balancing is properly carried out and readings to be taken and submitted.

i) Taking lux level reading of typical areas & its submission.

j) Numbering of poles and proper nomenclature on MV panels, feeder pillars indicating Incoming and outgoing etc.

I) HIGH MAST

1. Scope of works

a) The Scope of this section comprises Design, Supply, Installation, Testing and Commissioning of Apron flood light High Mast with LED light fittings suitable for wind loading as per IS 875 part-3-1987 with up to date amendments.

b) Soil testing by any NITs/ Govt. organization, Foundation design for High Mast shall be carried out after soil bearing capacity test and vetting from any NITs/Govt organization. The Coordination for testing and vetting shall be carried out by the contractor and report shall be submitted to AAI for which no payment shall be made separately. Only statutory payment made by contractor on behalf of AAI shall be reimbursed on production of documentary proof to AAI.

c) Careful dismantling of one number High mast shall be carried out with Hydra/JCBs and other required equipments. Nothing extra shall be paid to the contractor. If any parts/accessories get damaged during dismantling of high mast, the shame shall be provided by the contractor and nothing extra shall be paid to the contractor. Balanced material (light fittings etc.) after dismantling shall be handed over to AAI. Elevated portion of foundation above ground level shall be dismantled and leveled by the contractor. the dismantled cement concrete shall be disposed of site identified by AAI beyond 800 mtr. from site.

2. High Mast Specification

A) Structure :

The High mast shall be of continuously tapered, polygonal cross section, presenting a good and pleasing appearance and shall be based on proven In-tension design conforming to the standards referred to above, to give an assured performance, and reliable service. The structure shall be suitable for wind loadings as per IS 875 part 3- 1987.

The contractor, shall design, supply and install the flood lighting mast of minimum 16 Mtrs height to withstand a wind pressure as per IS 875 (with up to date amendment). The Mast shall be with a carriage on the top for mounting the luminaries which can be raised or lowered for maintenance purpose using an electrically operated integral winch housed in the base of the mast.

Supply & installation of luminaries on the flood light mast including aiming the same to the required angle, to achieve specified illumination levels, testing & commissioning the same.

Complete wiring from distribution box to the light fittings Including supply and fixing multi core unarmored copper cable of 1.1 KV grade fitted with multi pin plug/ socket etc as required.

Provision of LED aviation obstruction light fittings with lamp and other accessories suitable to use with 230 volt single phase 50 Hz AC supply for masts.

Provision for suitable contactor and relays for switching 'ON' fittings in the mast.

Warranty obligations including replacement at no additional charge, of fixtures, fittings, accessories etc during defect liability period.

Earthing for the equipments and providing necessary lightning arrestors, connecting with independent earthing pits with suitable earthing strips.

B) Construction :

The mast shall be manufactured using special steel plates, conforming to BS EN 10025 and shall be delivered in multiple sections. The mast shall be delivered in two sections to site. Each section shall be fabricated out of single plate duly folded and welded. There shall be only one longitudinal seam weld per section. Sections with more than one weld, circumferential or longitudinal, shall not be accepted. At site the sections shall be joined together by slip-stressed-fit method. No site welding or bolted joint shall be done on the mast. Detailed design calculation of the mast shall be submitted for verification.

The mast shall be provided with fully penetrated flange, which shall be free from any lamination or incursion. The welded connection of the base flange shall be fully developed to the strength of the entire section. The base flange shall be provided with supplementary gussets between the bolt-holes to ensure elimination of helical stress concentration for the environmental protection of the mast, the entire fabricated mast shall be hot dip galvanized, internally and externally.

C) Door Opening :

An adequate door opening shall be provided at the base of the mast and the opening shall be such that it permits clear access to equipment like winches, cables, Plug and Socket, etc and also facilitate easy removal of the winch the door opening shall be complete with a close fitting, vandal resistant, weatherproof door, provided with a heavy-duty double internal lock with special paddle Key.

The door opening shall be carefully designed and reinforced with welded steel section, so that the mast section at the base shall be unaffected and undue buckling of the cut portion is prevented. Size of door opening shall be adequate to avoid buckling of the mast section under heavy Wind conditions.

The opening should be sufficient for easy maintenance. Mounting plate or brackets are to be installed within the mast to support the winch and mast electrical equipment.

D) Dynamic Loading for the mast :

The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875 (up to three second gust), and shall be measured at a height of 10 meters above ground level. The design life of the mast shall be 25 years.

Mast shall be designed for maximum reaction arising as a result of dynamic analysis as per relevant IS codes. The design shall be such that wind excited oscillation shall be dampened as much as possible and an adequate allowance shall be made to resist stresses due to these oscillation. The tenderer shall indicate the method of dampening. Full calculations of the forces involved shall be provided by the tenderer in quadruplicate. In case design is done with the help of computer all input data design assumptions, forces indicted in each member shall be supplied including results.

E) Lantern Carriage :

(i) Fabrication :

A fabricated Lantern carriage shall be provided for fixing and holding the flood light fittings and control gear boxes. The lantern carriage shall be of special design and shall be of steel tube construction. The tubes acting as conduits for wires, with holes fully protected by grommets. The Lantern carriage shall be so designed and fabricated to hold the required number of flood light fittings and the control gear boxes, and also have a perfect self balance. The lantern carriage shall be fabricated in two halves and joined by bolted flanges with stainless steel bolts and nylon type stainless steel nuts to enable easy installations or removal from the erected mast. The inner lining of the carriage shall be provided with protective PVC arrangement, So that no damage is caused to the surface of the mast during the raising and lowering operation of the carriage. Carriage shall be hot dip galvanized after fabrication.

(ii) Junction Box :

Weather proof junction box, made of cast Aluminum shall be provided on the carriage Assembly as required, from which the inter-connections to the designed number of the flood light luminaries and associated control gears fixed on the carriage shall be made.

F) Raising and lowering mechanism :

For the installations and maintenance of the luminaries and lamps, it will be necessary to lower and raise the Lantern carriage Assembly. To enable this a suitable winch Arrangement shall be provided, with the winch fixed at the base of the mast and the specially designed head frame assembly at the top.

G) Winch

The winch shall be of completely self sustaining type, without the need for brake shoe, springs or clutches each driving spindle of the winch shall be positively locked when not in use, gravity activated PAWLS. Individual drum also should be operated for fine adjustment of Lantern carriage.
The capacity operating speed safe working load, recommended lubrication and serial number of the winch shall be clearly marked on each winch**.**

The winch drums shall be grooved to ensure perfect seat for stable and tidy rope lay, with no chances of rope slippage. The rope termination in the winch shall be such that distortion or twisting is eliminated and at least 5 to 6 turns of rope remains on the drum even when the Lantern carriage is fully lowered and rested on the rest shall be possible to remove the double drum after dismantling, through the door opening provided at the base for each winch in support of the maximum load operated by the winch.

H) Head Frame :

The head frame which is to be designed as a capping unit of the mast, shall be of welded steel construction, galvanized both internally and externally after assembly. The top pulley shall be of appropriate diameter, large enough to accommodate the stainless steel wire ropes and the multi-core electric cable. The pulley block shall be made of non- corrodible material, and shall be of die cast Aluminum Alloy. Pulley block made of synthetic materials such as plastic or PVC are not acceptable. Self-lubricating bearings and stainless steel assembly shall be fully protected by a canopy galvanized internally and externally.

Close fitting guides and sleeves shall be provided to ensure that the ropes and cables do not dislodge from their respective positions in the grooves. The head frame shall be provided with guides and stops with PVC buffer for docking the lantern carriage.

The axles of the pulley shall be made of stainless steel of appropriate grade and diameter, retained by stainless steel split pins and washers.

Separate ways are required internally for each wire rope and the cable. Externally and divider is to be fitted to separate ropes and cables to avoid- the possibility of over wrapping of the same during windy conditions and the carriage in the lowered conditions.

I) Stainless Steel Wire Ropes :

The suspension system shall essentially be without any intermediate joint and shall consist of only non-corrodible stainless steel of AISI 316 grade.

The stainless steel wire ropes shall be of 7/19 construction, the central core being of the same material.
The overall diameter of the rope shall not be less than 6 mm. The breaking load of each rope shall not be less than 2350kg. The end constructions of ropes to the winch drum

shall be fitted with talurit. The thimbles shall be secured on ropes by compression splices. Two Continuous lengths of stainless steel wire ropes shall be used in the system and no intermediate joints are acceptable in view of the required safety. **No intermediate joints/terminations, either bolted or else, shall be provided on the wire ropes between winch and lantern Carriage.**

J) Electrical System, Cable and Cable Connections :

A suitable terminal box shall be provided as part of the contract at the base compartment of the high mast for terminating the incoming cable. The electrical connections from the bottom to the top shall be made by special trailing cable. The cable shall be EPR insulated and PCP sheathed to get flexibility and endurance. Size of the cable shall be minimum 10 core 2.5 sq mm copper. The cable shall be of reputed make. At the top there shall be weather proof junction box to the individual luminaries shall be made by using 3 core 2.5 sq mm flexible PVC cables of reputed make.

Also, suitable provision shall be made at the base compartment of the mast to facilitate the operation of internally mounted, electrically operated power tool for raising and lowering of the lantern carriage assembly the trailing cables of the lantern carriage rings shall be terminated by means of specially designed metal clad multi pin plug and socket provided in the base compartment to enable easy disconnection when required.

K) Power Tool for the Winch :

A, suitable high-powered, electrically driven, internally mounted power tool, with manual over ride shall be supplied for the raising and lowering of the lantern carriage for maintenance purposes. The speed of the power tool shall be to suit the system. The power tool shall be single speed, provided with a motor of the reqd. rating. The power tool shall be supplied complete with suitable control. The capacity & speed of the electric motor used in the power tool shall be suitable for the lifting of the design load installed on the carriage.

The power tool mounting shall be so designed that it will be not only self supporting but also aligns the power tool perfectly with respect to the winch spindle during the operations. Also a handle for the manual operation of the winches in case of problem with the electrically operated tool, shall be provided and shall incorporate a torque limiting device. The power tool operation shall always be through a separate torque-limiting device to protect the wire ropes from over stretching. It shall be mechanical with suitable load adjusting device. The torque limiter shall trip the load when it exceeds the adjusted limits. There shall be suitable provision for warning the operator once the load is tripped off. The torque limiter is a requirement as per the relevant standards in view of the overall safety of the system.

L) Lightning Finial :

One number heavy duty hot dip galvanized lighting finial shall be provided for each mast. The lightning finial shall be adequate in length and shall be provided at the centre of the head frame. It shall be bolted solidly to the head frame to get a direct conducting path to the earth through the mast. **The lightning finial shall not be provided on the lantern carriage under any circumstances in view of safety of the system.**

M) Foundations:

Reinforced Concrete foundation required for masts shall be designed as per IS 454-78/ IS 4091- 79, holding down bolts, anchor plates and casting the same into foundations etc as require. These bolts shall be of guaranteed performance high tensile bolts. A precision made steel template with tubed hole to ensure correct vertical and horizontal hole alignment shall also be provided. Foundation shall be designed for safe bearing capacity as per relevant IS standards and shall be got approved from AAI based on site condition. Footing can be taken deeper, if required from structural consideration.

N) Samples: -

The AAI reserves the right to ask for samples of fixtures before the same are installed. These will be tested by an independent agency under AAI to confirm performance clamed. The cost of such testing and to and fro expense incurred during the testing will be borne by the tenderers.

O) Drawing & Technical Details:-

Following drawing and technical details shall be supplied by the tenderer before starting of work in approval Apron Layout drawing showing number of luminaries on each mast tower and the aiming angles, both horizontal as well as vertical. Computer prints outs for illumination levels on a grid of 10m* 10m.

Design calculations for the high mast light foundations for the mast specifications and fabrication/manufacturing details for the masts weight of the masts.

Operation and maintenance manual/ instructions should be submitted. The control circuit wiring for the control panel and feeder pillar keeping in view of the essential and non essential power supply.

Technical Specifications of High Mast

Sl No.	Description	Remarks	
1	Make		
2	Height of mast	16 Meter	
3	No. of sections	02 (Two) or as per manufacturer design	
4	Material construction	As per BS EN100025	
5	Base dia. and top diameter (A/F)	Top: 150-166 mm Bottom: 360-400 mm	
6	Plate Thickness	Top: 3 mm Bottom: 3 mm	
7	Cross section of Mast	12 Side polygon	
8	Overlapping (Between sections)	As per manufacturer	
9	Standard for galvanization	As per BS EN ISO 1461/ Thickness Minimum 65 micron	
10	Size of opening and door at base	(1050 x 225 mm)	
11	Diameter of base plate & Thickness	520 x 25 mm	
12	Lightning protection finial	G.I single mini spike	
13	Max. wind speed	47 m/s as per IS: 875 (Part – III)	
14	Number of foundation bolts	4 Nos. or as per standard design	
15	Pcd of foundation bolts	445 mm or as per standard design.	
16	Type/diameter/length of foundation bolts	TS 600/24 mm dia, 850 mm long	
	LUMINARIES CARRAIGE		
1	Material of construction	40 NB ERW Class B- M.S. Pipe or as per IS 2062	
2	Diameter of carriage ring (mm)	450 mm (ID)	
3	Construction	8 Arms, welded, 02 sections	
4	Load carrying capacity	08 Luminaire symmetrical	
	TRAILING CABLE		
1	Conductor	Copper, 10 Core, 2.5 Sq mm	

2	Insulation	EPR insulated PVC flexible or equivalent.	
3	No. of circuits per mast	One no. cable per mast	
	WINCH/POWER TOOL		
1	Type/SWL of winch	Double drum, SWL 350 Kg	
2	Method of operation	Integral Motor	
3	Motor capacity	0.75 HP	
4	No of speeds	Single speed, 06 pole	
5	Input Supply	230V, 50 c/s; 1-ph	
6	Torque limitor	With mechanical tripping facility	
	STAINLESS STEEL WIRE ROPE		
1	Construction	AISI 304, 7-19	
2	Number of ropes	2 continuous	
3	Factor of Safety	>5	
4	Diameter (mm)	5 mm	
5	Breaking load capacity	1350 Kg x 2 minimum	

J) SPECIFICATION OF LED TYPE LIGHTFIXTURES

Sl. no.	Technical Parameters	Recommended Requirements for Outdoor Light
1	Efficiency of LED light fitting (Efficacy)	Min 110 Lumens / Watt
2	Life of LED light fitting	Not less than 50000 burning Hours.
3	Approved make for LED	Nichia/Cree/Osram/Phillips (Lumiled)/ Sharp / Seoul/ Ever light / Citizen (Japan)/ Bridge lux / Samsung
4	CRI (Colour Rendering index)	Min 70 for outdoor applications
5	THD (Total Harmonic Distortion)	Less than 10%
6	Voltage Range	140 V to 270 V
7	Type of Housing	High pressure die cast aluminum/ standard alloy for outdoor applications.
8	IP Category	IP 65 or higher.
9	Surge Protection	>4 kv
10	Labeling I identification Mark	Manufacturers Name / Logo engraved / Embossed on housing / body or Name/ Logo on aluminum plate Labels or Name/ Logo printed on housing / body
11	Warranty period	5 years warranty from actual date of completion of work on complete luminiare including driver / control gear, LED, all accessories etc
12	Power Factor	Equal to 0.95 or More
13	Total Power consumption of fitting.	Not More than 110 % of rated capacity of LED Light fitting.
14	Approved make of Driver	Meanwell/ Inventories/ C & S / Moso Power / Bag/ Phillips/ Wipro/ Osram/ Bajaj/ Pharos / Fulham/ Helver/ OEM of Light Fixture.
15	Type of Driver	Enclosed / Encapsulated

16	Efficiency of Driver	≥85%
17	Testing Facility	LED Luminaire manufacturer shall have in-house NABL accredited Photometry lab.
18	BIS Registration	All Luminaire & drivers shall be BIS registered.
19	Housing Thickness	Housing of Luminaires shall ≥ 0.5 mm for CRCA or 1 mm for Extruded Aluminium or 1.5 mm for PDC aluminium or heavier if so required to meet the application requirement.
20	IK Raking	IK 07 or above
21	LED Binning (Standard Deviation Colour Matching)	< 5 (SDCM)
22	Unified Glare Rating (UGR)	NA

Note: - An undertaking be obtained from fitting manufacturer regarding confirmation about use of said make LED's in their fittings.

The guarantee / warrantee for LED light fixtures shall be 05 years from the date of completion of work. Before releasing of Security Deposit of the work after completion of defect liability period, bidder has to submit separate Bank Guarantee for an amount equal to 10% amount of completed cost for LED light fixtures and shall be valid for 05 years from the date of completion of work. OR same amount shall be withheld from the final bill and same shall be released after 05 years from the date of completion of work.

K) LT PANELS

3. General

This section covers the detailed requirements of medium voltage switchboard for 415 volts, 3 phase, 50 Hz, 4 wire system. The LT Panels for Incomer above 250 A shall be TTA type as per IEC 61439 -1 & 2 and Incomer upto 250 A shall be PTTA type as per IEC 60439.

4. Standards and Codes

Updated and current Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract.

Low Voltage switchgear Assemblies		For PTTA: IEC 60439
Low Voltage switchgear & control gear		For PTTA: IEC 60439
Part-I	General rules	
Part-II	Circuit Breakers	
Part-III	Switches, disconnectors, switch disconnectors and fuse combination units	
Part-IV	Contactors and Motor starters	
Part-V	Control circuit devices and switching elements	
Degree of Protection of Enclosures for low voltage switchgear.		IEC60529 / IS 2147 : 1962
Internal arc tests		IEC61641
Voltage Transformer		IS – 3156
Current Transformer		IS - 2705

5. Switch Boards

5.1 The switch board shall be dust & vermin proof and shall be suitable for the climate conditions as specified. The design shall include all provisions for safety of operation and maintenance personnel.

General construction shall employ the principle of compartmentalization and segregation for each circuit. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type panel shall have hinged access doors at the rear.

The LV switchboards shall be Type Tested as per the standards IEC61439-1&2. The drawings of the type-tested assemblies shall be made available for inspection.

Switchboards shall have a short circuit level withstand as per Schedule of Quantities and drawings.

The enclosures shall be designed to take care of normal stress as well as abnormal electromechanical stress due to short circuit conditions. All covers and doors provided shall offer adequate safety to operating persons and provide ingress protection of IP 42 unless otherwise stated. Ventilating openings and vent outlets, if provided, shall be arranged such that same ingress protection of IP 42 is retained. Suitable pressure relief devices shall be provided to minimize danger to operator during internal fault conditions.

For operator safety IP2 X (touch proof) protection to be available even after opening the feeder compartment door. The compartmentalization to be achieved by using metal separators, use of PVC sheet / Hylem sheets shall not be allowed.

Switchboard shall be form 4B, for form of separation only, metallic covers shall be used and Hylem / PVC sheets shall not be allowed.

All switch board panels having incomer rating upto and including 250 Amp shall be of partially type tested (PTTA) panels. The outdoor feeder pillars and APFC cum hybrid panels shall also be PTTA type panels irrespective of rating of incomer switchgear.

5.2 Constructional Features

The Switchboards shall be metal clad totally enclosed, floor mounted free standing type of modular extensible design suitable for indoor mounting. Switchboards construction shall employ the principle of compartlization and segregation for each circuit.

Incomer and bus section panels or sections shall be separate and independent and shall not be wired with sections required for feeder. The incomer panel shall be suitable for receiving bus trunking or MV cable of size specified.

Switchboards shall be made up of requisite vertical sections, which when coupled together, shall form continuous dead front switchboards. Switchboard shall be readily extensible on both sides by addition of vertical sections after removal of the end covers.

The switchboards shall be designed for use in high ambient temperature and humid tropical conditions as specified. Ease of inspections, cleaning and repairs while maintaining continuity of operation shall be provided in the design.

Metal based neoprene gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust and vermin proof to provide required degree of protection as stipulated in schedule of quantities. The unused openings within the switchboards shall be closed using suitable grommets.

Special care to be taken to ensure effective earthing of the frame and doors of the switchboards.

Each vertical section shall be provided with a rear or side cable chamber housing the cable end connections and power / control cable terminations. There should be generous availability of space for ease of installation and maintenance with adequate safety for working in one vertical section without coming into contract with any live parts. The design of the switchboard shall allow standard extension chambers if required to accommodate cables.

Switchboard panels and cubicles shall be fabricated with CRCA Sheet Steel of thickness not less than 2.0 mm and shall be folded and braced as necessary to provide a rigid support for all components. The doors and covers shall be fabricated from CRCA sheet steel of thickness as per manufacturer standard. Separate gland plate for each power cable (i.e. 3.5X150 sq.mm. or above) shall be provided.

In general the panel shall be fabricated from CRCA sheet steel material with following thicks:

Enclosure	:	2mm
Door	:	2mm
Partitions	:	1.6mm
Base plates	:	3mm
Gland plates	:	3mm
Reinforcement Channels	:	3mm

All panels and covers shall be properly fitted and square with the frame. The holes in the panel shall be correctly positioned.

Switchboard shall be provided with “Danger Notice Plate” conforming to relevant Indian Standards.

Internal arc tests as per IEC 61641, 0.4 sec as per system design fault level at HBB, VBB and cable chamber. Copies of the test certificates shall be submitted along with the tender.

Copies of the test certificates shall be submitted along with the tender. Switchboard shall be provided with “Danger Notice Plate” conforming to relevant Indian Standards.

5.3 Switchboard Dimensional Limitations

The overall height of the switchboard shall be limited to 2400 mm for all the Busbar ratings and type of switchboards. Panel should have integral base frame of 75mm, hence total panel height should not be more than 2475mm.

The height of the operating handle, push buttons etc shall be restricted between 300 mm and 1700 mm from finished floor level.

Other dimensional limits if any are specified separately.

5.4 Switchboard Compartmentalization

For compartmentalized switchboards, separate totally enclosed compartments shall be provided for horizontal bus bars, vertical bus bars, ACBs, MCCBs, and cable alloys.

The main board shall be with Form 4B Construction with metallic shrouding only, FRP is not acceptable.

Sheet steel hinged lockable doors for each separate compartment shall be provided and duly interlocked with the breaker in "ON" and "OFF" position.

For all Circuit Breakers separate and adequate compartments shall be provided for accommodating instruments, indicating lamps, control contactors and control MCB etc. These shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker, bus bars and connections.

For Some MCCB feeders for critical loads like UPS it may be required to have operation only after opening the door, all other facilities like padlock able rotary handle to be provided for such feeder. It shall be possible to do this change during execution of order.

Each switchgear cubicles shall be fitted with label in front and back identifying the circuit, switchgear type, rating and duty. All operating device shall be located in front of switchgear only.

A horizontal wire way with screwed cover shall be provided at the top to take interconnecting control wiring between vertical sections.

Separate cable compartments running the height of the switchboard in the case of front access boards shall be provided for incoming and outgoing cables.

Cable compartments shall be of adequate size for easy termination of all incoming and outgoing cables entering from bottom or top. The construction shall include necessary and adequate and proper support shall be provided in cable compartments to support and clamping the cable in the cable alley / cable chamber.

5.5 Switchboard Bus Bars

Bus bars shall be made of high conductivity, high strength Aluminum Bus bars shall be of rectangular cross sections, of suitable thickness as per table VI of CPWD Internal specification suitable for full load current for phase bus bars and half / full rated current for neutral bus bar or as stipulated in schedule of quantities. Busbar shall be suitable to withstand the stresses of fault level as specified in schedule of quantities.

Main Horizontal busbar and Neutral should be in same compartment.

The bus bar system may comprise of a system of main horizontal bus bars and auxiliary vertical bus bars run in bus bar alloy on either side in which the circuit could be arranged with front access for cable entrances.

The bus bars shall be supported on non-breakable, non-hygroscopic epoxy resin or glass fiber reinforced polymer insulated supports able to withstand operating temperature as per Type Test Report of at regular intervals, to withstand the forces arising from a fault level as stipulated in schedule of quantities. The material and the spacing of the Busbar supports should be same as per the type tested assembly.

Auxiliary buses for control power supply, space heater power supply or any other specified service shall be provided. These buses shall be insulated, adequately supported and sized to suit specific requirement. The material for auxiliary supply bus will be insulated electrolytic copper. Phase Clearances should be in line with IEC.

5.6 Switchboard Interconnection

All connection and tap offs shall be through adequately sized connectors appropriate for fault level at location. This shall include tap off to feeders and instrument/control transformers.

For unit ratings up to 250 amps, FRLS/ HFFR insulated copper conductor cables of adequate size to carry full load current shall be used. The terminations of such interconnections shall be crimped. Solid connections shall be used for all rating of above 250 amps.

All connections, tapings, clamping, shall be made in an approved manner to ensure minimum contact resistance. All connections shall be firmly bolted and clamp with even tension. Before assembly joint surfaces shall be filed or finished to remove burrs, dents and oxides and silvered to maintain good continuity at all joints. All screws, bolts, washers shall be zinc plated. Only 8.8 grade nuts and bolts shall be used for busbar connections.

5.7 Instrument Accommodation

All voltmeter and ammeter and other instruments shall be flushed mounted type of size 96 sq. mm conforming to IS 1248 for accuracy. All voltmeter shall be protected with MPCBs.

Instruments and indicating lamps shall not be mounted on the Circuit Breaker Compartment door for which a separate and adequate compartment shall be provided and the instrumentation shall be accessible for testing and maintenance without danger of accidental contact with live parts of the Switchboard.

For MCCBs, instruments and indicating lamps can be provided on the compartment doors.

The current transformers for metering and for protection shall be mounted on the solid copper/aluminum busbars with proper supports.

On all the incomers of switch boards ON/OFF indicators lamps shall be provided suitable for operation on AC 230 volts supply. All lamps shall be protected by MCBs.

Panel shall be rated for Impulse withstand capability equal to or greater than 12KV.

For Incomer and important outgoing feeders comprehensive power meters shall be provided which shall display A, V, Pf, Hz, KW, KVA, KVAr, Kwh, Kvarh, average and maximum values, demand values, THD on current and Voltages, Individual harmonics up to 31st level. Also add modules for the RS485 port, programmable contacts, analogue output etc. to link to the SCADA system.

5.8 Wiring

All wiring for relays and meters shall be FRLS/ HFFR insulated copper conductor cables. The wiring shall be coded and labelled with approved ferrules for identification. The minimum size of copper conductor control wires shall be 2.5 sq. mm. Runs of wires shall be neatly bunched and suitably supported and clamped. Means shall be provided for easy identification of wires. Identification ferrules shall be used at both ends of wires. All control wires meant for external connections are to be brought out on a terminal board. The cables and control wires shall be suitable for withstanding 105 deg C.

5.9 Ventilation Fans

The Switchboard shall be provided with panel mounting type ventilation fans in each panel with switchgear rated for 4500 amp and above. The fan shall be interlocked with switchgear operation. The degree of enclosure protection to be maintained even with Fans.

5.10 Earthing

Continuous earth bus sized for prospective fault current to be provided with an arrangement for connecting to station earth at two points. Hinged doors/frames to be connected to earth through adequately sized flexible braids.

5.11 Sheet Steel Treatment And Painting

The sheet steel used in the fabrication of switchboards shall undergo a rigorous cleaning and surface treatment seven-tank process comprising of alkaline degreasing, descaling in

dilute sulphuric acid and a recognized phosphating process after which a coat of primer paint compactively with the final paint shall be applied over the treated surface. Final paint coat of oven-baked powder coating, of minimum 50-micron thickness, of sheet approved by Engineer-in-Charge shall then be provided.

5.12 Name Plates and Labels

Suitable engraved white-on-black nameplates and identification labels of metal for all Switchboards and Circuits shall be provided. These shall indicate the feeder number and feeder designation.

5.13 Type test reports

Switchboard configurations offered shall be CPRI /Independent international test house tested for all the tests as per IEC61439-1 & 2 and internal arc tests. Copies of the test certificates shall be submitted with the tender.

5.14 Testing at Works

Copies of type tests carried out at the manufacturer's works and routine tests carried out at the switchboard fabricator shop shall be furnished along with the delivery of the switchboards. Engineer-in-Charge reserves the right to get the switchboard inspected by their representative at the fabricator's works prior to dispatch to the site to witness the following.

a) Physical variation and dimensional check

b) Verification of bill of material

c) Functional check

d) HV test

e) IR test

6. OPERATIONAL REQUIREMENT

The indoor-type MV panel conforms to the following:

(a) The panel shall comprise of incomers, outgoing feeders and bus coupler as specified. The incomer shall be either a double break/contract repulsion MCCB or an Air Circuit Breaker. The bus coupler shall be either a circuit breaker or a double break/contact repulsion MCCB or switch disconnector fuse unit as specified. The outgoing feeders shall be circuit breakers / MCCBs as required.

(b) Bus bars for phase and neutral shall have a rating as specified in the BOQ.

(c) The entire switch panel shall be cubical type generally conforming to IS 8623:1993 for factory assembled switch board.

(d) The incomer panel shall be suitable for receiving bus trunking or MV cable of size specified either from the top or from bottom.

(e) All incoming AIR CIRCUIT BREAKER /MCCB shall have suitable adjustable tripping current and time delay settings.

(f) The entire panel shall have a common earth bar size as specified with two terminals for such connections.

7. RATING AND REQUIREMENTS

7.1 MCCBs:

All MCCBs shall be current limiting type with features of load line reversibility and suitable for horizontal/ vertical mounting without any derating. Beyond 300 Amps capacity MCCBs shall have positive isolation and preferably double break/ contact repulsion & double insulation features.

The MCCBs shall invariably be used with terminal spreaders.

7.2 TEST AT THE MANUFACTURERS WORK

All routine tests shall be carried out and test certificates produced to the department.

7.3 INSTALLATION

The installation work shall cover the assembly of various sections of the panels lining up, grouting the units etc. In the case of multiple panel switch boards after connecting up the bus bars etc., all joints shall be insulated with necessary insulation tape or approved insulation compound. A common earth bar shall be run inside at the back of the switch panel connecting all the sections for connection to the frame earth system. All protection and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

7.4 TESTING AND COMMISSIONING

Commissioning checks and tests shall include all wiring checks and checking up of connections. Relay adjustment/ setting shall be done before commissioning in addition to routine megger tests. Checks and tests shall include the following: -

(a) Operation checks and lubrication of all moving parts.
(b) Interlock function checks.
(c) Continuity checks of wiring, fuses etc. as required.
(d) Insulation test: When measured with 500 V megger the insulation resistance shall not be less than 100 mega ohms.
(e) Trip tests and protection gear tests.

L) L.T. CABLES

1. General

L.T. Cables shall be supplied, inspected, laid tested and commissioned in accordance with drawings, specifications, relevant Indian Standards specifications and cable manufacturer's instructions. The cable shall be delivered at the site in original drums with the manufacturer's name clearly written on the drums. The recommendations of the cable manufacturer with regard to jointing and sealing shall be strictly followed.

2. Construction

L.T. Cables, 1.1 KV grade, shall be XLPE insulated and PVC sheathed aluminium conductor armoured cables conforming to IS: 7098 (Part I) respectively. Conductor of power cables shall be made of electrical purity aluminium conforming to IS: 8130-1984.

3. Inspection

An inspection shall be carried out as per the category requirement of test certificates/inspection mentioned in AAI's list of approved make.

4. Joints in Cables

The Contractor shall take care to see that the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoiding of cable joints. This apportioning shall be got approved from Engineer-in-Charge before the cables are cut to lengths.

5. Cable Laying

Cables shall be laid directly in ground, pipes, HDPE pipe, masonry ducts, on cable tray, and on surface of wall / ceiling etc. as indicated on drawings or schedule of quantities as per the direction of Engineer-in-Charge or site requirement. Cable laying shall be carried out as per CPWD specifications amended up to date.

5.1 Cables Laying in Ground

Cables shall be laid by skilled experienced workmen using adequate rollers. The cable drums shall be placed on jacks before unwinding the cable. With great care, it shall be unrolled on over wooden rollers placed in trenches at intervals not exceeding 2 meters.

Cables shall be laid at depth of 750 mm below ground level upto 1.1 KV grade and 1200 mm above 1.1 KV grade. A sand cushion of 80mm & 170 mm shall be provided below & above the cable respectively, joint boxes and other accessories. Cables shall not be laid in the same trench or along side a water main. Width of the trench shall be 350 mm (minimum) for laying single cable.

The relative position of the cables, laid in the same trench shall be preserved. At all changes in direction in horizontal and vertical planes, the cables shall be bent smooth with a radius of bent not less than 12 times the diameter of cables. Minimum 3-meter-long loop shall be provided at both end of cable.

Distinguishing marks may be made on the cable ends for identifications of phases. Insulation tapes of appropriate voltage and in red, yellow and blue colours shall be wrapped just below the sockets for phase identifications.

5.2 Protection of Cables

The cables shall be protected by bricks laid on the top layer of the sand for the full length of underground cable. Where more than one cables is laid in the same trench, the bricks shall cover all the cables and shall project a minimum of approximately 50mm on either side of the cables. Cable under road crossings and any other places subject to heavy traffic shall be protected by running them through Hume / RCC / HDPE Pipes of suitable size.

5.3 Excavation & Back Fill

All excavation and back fill required for the installation of the cables shall be carried out by the contractor in accordance with the drawings and requirements laid down elsewhere. Trenches shall be dug true to line and grades. Back fill for trenches shall be filled in layer not exceeding 150 mm. Each layer shall be properly rammed and consolidated before laying the next layer.

The Contractor shall restore all surface, roadways, sidewalks, kerbs wall or the works cut by excavation to their original condition to the satisfaction of the Engineer-In-Charge.

5.4 Laying of cables on cable Tray / Surface of Wall / Ceiling

Cable shall be laid on perforated M.S. Cable tray. Cables shall be properly dressed before cable ties / clamps are fixed. Wherever cable tray is not proposed, cables shall be fixed on surface of wall or ceiling slab by suitable MS clamps / saddles. Care shall be taken to avoid crossing of cable.

5.5 Laying Cables in Ground

Cables shall be laid by skilled experienced workmen using adequate rollers to minimize stretching of the cables. The cable drums shall be placed on jacks before unwinding the cable. With great care it shall be unrolled on over wooden rollers placed in trenches at intervals not exceeding 2 metres. Cables shall be laid at depth of 0.75 metres below ground level for LT cables. A cushion of sand total of 250mm shall be provided both above and below the cable, joint boxes and other accessories. Cable shall not be laid in the same trench or alongside a water main. The cable shall be laid in excavated trench over 80mm layer of sand cushion. The relative position of the cables, laid in the same trench shall preserved. At all changes in direction in horizontal and vertical planes, the

cables shall be bent smooth with a radius of bent not less than 12 times the diameter of cables. Minimum 3 metre long loop shall be provided at both end of cable. Distinguishing marks may be made on the cable ends for identifications of phases. Insulation, tapes of appropriate voltage and in red, yellow and blue colours shall be wrapped just below the sockets for phase identifications.

The contractor shall restore all surface, roadways, sidewalks path, kerb or the places cut by excavation to their original condition to the entire satisfaction of the Engineer In charge.

5.6 Laying in covered duct

Covered duct shall be provided between substation and switch rooms (where feasible) at Terminal Building for taking the cables. Suitable angle iron supports will be provided in this duct by AAI. The contractor shall fix the cables by using suitable clamps. The size and material of saddles/clamps shall be as given under laying on surface. AAI may opt for fixing cable trays on angle iron supports and taking / laying cables in trays.

5.7 Cables Hangers or Racks

The Contractor shall provide and install all iron hangers racks or racks with die cast cleats with all fixings, rag bolts or girder clamps or other specialist fixing as required. Where hangers or racks are to be fixed to wall sides, ceiling and other concrete structures, the Contractor shall be responsible for cutting away, fixing and grouting in rag bolts and making good. The hangers or racks shall be designed to leave at least 25mm clearance between the cables and the face to which it is fixed. Multiple hangers shall have two or more fixing holes. All cables shall be saddled at not more than 150mm centres. These shall be designed to keep provision of some spare capacity for future development.

6. Cable Tags & Cable Route Markers

6.1 Cables Tags

Cable tags shall be made out of 2mm thick aluminium sheets/PVC, each tag 1-1/2 inch in dia with one hole of 2.5mm dia, 6mm below the periphery. Cable designations are to be punched with letter/number punches and the tags are to be tied inside the panels beyond the glanding as well as below the glands at cable entries. Trays tags are to be tied at all bends.

6.2 Testing of Cables

Prior to installation burying of cables, following tests shall be carried out: Insulation test between phases, phase & neutral, phase & earth for each length of cable.

a) Before laying;

b) After laying;

c) After jointing.

On completion of cable laying work, the following tests shall be conducted in the presence of the Engineer in Charge.

a) Insulation Resistance Test (Sectional and overall).

b) Continuity Resistance Test.

c) Earth Test.

All tests shall be carried out in accordance with relevant Indian Standard code of practice and Indian Electricity Rules. The Contractor shall provide necessary instruments, Equipment's and labour for conducting the above tests & shall bear all expenses of conducting such tests.

M) DWC HDPE PIPES

1. Supply of HDPE pipes

HDPE pipes supply shall be made as per the Schedule of Quantities. However, site requirement to be taken and qty. confirmation to be get done from the EIC (Engineer-in-charge)/authorized officials before supply as the tender quantities are tentative. Only required quantity to be supplied after taking approval.

Proper site survey, measurements, requirement to be made before procurement action.

The pipes samples shall be submitted and got approved before supply. Quantity required should be assessed as per the site requirement and supplies shall be made as per the clearance of the E-I-C or his authorized representative.

Pipe outer diameter OD, ID shall be as per the SOQ and ISI marked quality as per the approved makes

i) DWC HDPE Pipes conforming to IS 16205 part 24 / IS 14930 part -II including all accessories as required.

Where longer lengths are required, the same to be supplied as per the site requirement in single coils, joint less. Where jointing is required, proper jointing of pipes to be done with appropriate machines / Accessories as required. If this is not possible, suitable pipe fittings and accessories shall be supplied. In case of bulk supplies embossing/marking of dept. name, year etc. may be done required at regular intervals as per the instructions of EIC. Similarly, any color choice is asked to distinguish the services/feeders, the same to be supplied if feasible. Factory inspection may be required. Therefore, all these client's requirements to be taken care before manufacture/supply.

In some case there can be change in the specification of pipes as per latest requirement and may be different from the item specified in the tender. Therefore, the actual requirement to be got confirmed before order/supply.

Following to be got confirmed before supply.

- Size OD, ID.
- Make
- Length-total requirement and single length
- Color, embossing/marking requirement in case of bulk supplies beyond 1000 mtrs.

2. Inspection/Tests:

The material shall comply with the relevant recent IS specifications. Test certificates to

be submitted as per AAI requirement.

3. Laying of HDPE Pipes:

Works to be executed as per site requirement, schedule of quantities and direction of E-I-C. The laying quantities mentioned in the tender are tentative and may vary as per site requirement. Detailed survey to be made, measurements to be taken for actual requirement. Drawing shall be submitted by the contractor with relevant information for approval before commencement of the work. Pipes/cable laying shall be done as per the approved drawings.

Excavation of trenches shall be done with JCB/ hydraulic excavator/ concrete breakers/ manual means as per the site requirements and feasibility. Where required necessary cranes, automobiles and other special means and specialized teams to be deployed.

At some places manual digging will be required as per site conditions, existence of live power cables etc.

Where crossing of nallahs, roads, culverts, taxis, runways, buildings, structures etc., suitable pipe protection to be provided or suitable grade, pressure rating, adequate wall thickness to be used to withstand the loading.

3.1 Depth of Laying:

Unless otherwise specified, the depth of laying shall be 75 cm for LT cables & 150 cm for AFL cable.

3.2 Width of trenches:

Shall be suitable to the pipe/cable sizes, no of runs etc.

3.3 Pipe/Cable route:

To be planned in advance carefully and drawings to be made and got approved. However, any deviations are required as per site requirement, the same shall be done. In general, trenches shall have uniform width & depth and be straight and parallel to the road, wall, taxi, runway etc. unless crossings are required.

3.4 Care for underground cables/pipes, structures etc.

Proper planning and care at every stage is essential as often, live cables are cut during cable laying/JCB/HDD works. Experienced supervision, assistance, work force, proper tools & plants, machinery to be used.

3.5 Manholes

Where required, proper manholes to be provided with covers as specified in BOQ.

3.6 Leveling of excavated trenches:

Post excavation and laying of pipes, the excavated material to be back filled with due compacting, ramming, levelling so that no abnormal undulations, ditches, heaps, bumps are left. This is one of the most common lapse of contractors. In case of default, AAI reserves the right to make good the damages and deduct the cost from the contractor bills/dues.

3.7 Laying of cables through pipes:

Due care required in handling the cable drums, pulling of cables without twisting, damaging the cable. Cable pulleys to be used. Adequate loop to be given at manholes, other strategic locations. Suitable Pull wires/cables/machines to be used.

3.8 Pipe protection/concrete work etc.:

As per site requirement for certain applications like laying across runway/taxi/ culverts/Nallahs special protection in the form of sand/concrete bedding below the pipes, slabs/concrete above the pipes and concrete pedestals to be provided.

N) EARTHING

1. Scope

This section covers the essential requirements of earthing system components and their installation. For details not covered in these specifications, IS Code of Practice on earthing (IS: 3043-1987) CPWD General Specifications for Electrical works (Part-I-Internal) as amended up to date and in the regulations of the local Electrical Supply Authority shall be referred to.

2. Application

i) The electrical distribution system is with earthed neutral (i.e. neutral earthed at the transformer / generator end). In addition to the neutral earthing, provision is made for earthing the metallic body of equipments and non-current carrying metallic components in the substation, as well as in the internal / external electrical installations.

ii) Earthing requirements are laid down in Indian Electricity Rules, 1956 and Indian Standard Specification IS: 3043:1987 with latest amendment as amended from time to time, and in the Regulations of the Electricity Supply Authority concerned. These shall be complied with.

iii) In this work Pipe Earthings shall be provided for protection of lighting system. One earthing shall be connected to minimum 15 Nos. Light fittings for protection against Lightning etc.

3. Materials

The material of earth and earth conductor shall be as specified in SOQ.

3.1 Earth Electrodes

The earth electrode shall be Plate / Pipe earth electrode as specified in SOQ and the materials and size of earth electrodes shall be as specified

3.2 Earthing Conductor

The earthing conductor (protective conductor from earth electrode upto the main earthing terminal/ earth bus, as the case may be) shall be of the same material as the electrode, viz. GI or copper and in the form of wire or strip as specified. The size of earthing conductor shall be as specified.

Each equipment shall be connected with two independent earth conductors to earth bar located in respective area. Each earth bar shall be connected to Earth Grid by two independent earth conductors. Earthing Grid shall be directly connected by two independent earth electrodes. Earthing shall be of GI or Copper.

3.3 Hardware Items

All hardware items used for connecting the earthing conductor with the electrode shall be of GI in the case of GI pipe and GI plate earth electrode and forged tinned brass in case of copper plate electrodes.

3.4 Location for Earth Electrodes

Normally earth electrodes shall not be located closer than 1.5 m from any building. Care shall be taken to see that the excavation for earth electrode does not affect the foundation of the building; in such cases electrodes may be located further away from the building, with the prior approval of the Engineering-In-Charge.

The location of the earth electrode shall be such that the soil has a reasonable chance of remaining moist as far as possible. Entrances, pavements and roadways, shall be avoided for locating earth electrodes.

When more than one electrode (plate / pipe) are to be installed, a separation of not less than 2m shall be maintained between adjacent electrodes.

4. Installation

4.1 Electrodes

4.1.1 Pipe Electrode

Earthing electrode shall consist of a medium class GI Pipe of approved make not less than 40 mm dia and 4.5 meters long. GI Pipe electrode shall be cut tapered at the bottom and provided with holes of 12mm dia drilled at not less than 75 mm interval upto 2 meters length from bottom. The electrode shall be buried vertically in the ground as far as practicable below permanent moisture level with its top at not less than 20 cm below ground level. The electrode shall be in one piece and no joints shall be allowed in the electrode. Wherever possible earth electrodes shall be located as near water tap, water drain or a down take pipe. Earth electrodes shall not be located in proximity to a metal fence. It shall be kept clear of the building foundations and in no case shall be nearer than 2 meters from the outer face of the wall.

The pipe earth electrode shall be kept vertically and surrounded with 150 mm thick layer of charcoal dust and salt mixture upto a height of 2.0 meters from the bottom. At the top of the electrode a funnel with a mesh shall be provided for watering the earth. The main earth conductors shall be connected to the electrode just below the funnel, with proper terminal lugs and check nuts.

In locations where the full length of pipe electrode is not possible to be installed due to meeting a water table, hard soil or rock, the electrode may be reduced length, provided the required earth resistance result is achieved with or without additional electrodes, or

any alternative method of earthing may be adopted, with the prior approval of the Engineer-In-Charge. Pipe electrodes may also be installed in horizontal formation in such exceptional cases.

4.1.2 Plate Earth Electrode

Earthing shall be provided with GI / copper plate electrode as mentioned in SOQ of following.

i. GI Plate Electrode : 600 mm x 600 mm x 6 mm thick

ii. Copper Plate Electrode : 600 mm x 600 mm x 3 mm thick

The electrode shall be buried in ground with its faces vertical and not less than Three (3) meters below ground level. 20 mm dia medium class GI pipe shall be provided and attached to the electrode. Earth electrode shall not effect the column footing or foundation of the building. In such cases electrode shall be further away from the building. Plate electrode shall be connected with earthing conductor strip through brazing along with tightening with nut bolts.

4.2 Watering Arrangement

i) In the case of plate earth electrodes, a watering pipe of 20 mm dia. medium class GI pipe shall be provided and attached to the electrodes as shown in the drawing and a funnel with mesh shall be provided on the top of this pipe for watering the earth.

ii) In the case of pipe electrodes, a 40 mm x 20 mm reducer shall be used for fixing the funnel with mesh.

iii) The watering funnel attachment shall be housed in a masonry enclosure of size not less than 300 mm x 300 mm x 350 mm deep.

MS frame with 6 mm thick MS cover and having ALLEN Key locking arrangement shall be suitably embedded in the masonry enclosure. The top enclosure shall be provided of 50 mm thick PCC.

The details of Plate / Pipe earth electrode, a detailed drawing as referred in CPWD specification of Internal EI shall be referred.

4.3 Earth Conductor

In the case of pipe earth electrodes, wire type earthing conductor shall be secured by using a through bolts, nuts and washers and terminating socket.

The earthing conductor from the electrode upto the building shall be protected from mechanical injury by a medium class, 15 mm dia GI pipe in the case or wire, and by a minimum of 40 mm dia, medium class GI pipe in the case of strip. The protection pipe in

ground shall be buried at least 30 cm deep (to be increased to 60 cm in case of road crossing and pavements). The portion within the building shall be fixed on walls.

The earthing conductor shall be securely connected at the other end to the earth stud/ earth bar provided on the switch board by Soldered or preferably crimped lug, bolt, nut and washer in the case of wire, and, Bolt nut and washer in case of strip conductor.

4.4 Earth Bus and Main Earthing Terminal

In all installations, main earthing terminal shall be provided at the main switchboard. This may be in the form of earth stud or single earth bar depending on the type of the switchboard.

Following conductors shall be terminated on to the main earthing terminal.

a) Earth connection from electric supply company (where provided)

b) Earthing conductor from electrode.

c) Protective conductors

d) Equi-potential bonding conductors.

4.5 Protective (Loop Earthing / Earth Continuity) Conductor

Earth terminal of every switchboard in the distribution system shall be bonded to the earth bar / terminal of the upstream switchboard by protective conductors.

Two protective conductors shall be provided for a switchboard carrying 3 phase switchgear thereon.

4.6 Earth Resistance

The earth resistance at each electrode shall be measured. No earth electrode shall have a greater ohmic resistance than 5 ohms as measured by an approved earth testing apparatus. In rocky soil the resistance may by up to 8 ohms.

Where the above stated earth resistance is not achieved, necessary improvement shall be made by additional provisions, such as additional electrode (s), different type of electrode, or artificial chemical treatment of soil etc., as may be directed by the Engineer-In-Charge.

4.7 Marking

i) Earth bars / terminals at all switch board shall be marked permanently, as 'E'.

ii) Main earthing terminal shall be marked 'SAFETY EARTH- DO NOT DISCONNECT'.

4.8 Measurement of Earth Electrode Resistance

Two auxiliary earth electrodes, besides the test electrode, are placed at suitable distance from the test electrode. A measured current is passed between the electrode 'A' to be tested and an auxiliary current electrode 'C' and the potential difference between the electrode 'A' and auxiliary potential 'B' is measured. The resistance of the test electrode 'a' is then given by

R= V / I

Where,

R- Resistance of the test electrode in ohms

V- Reading of the voltmeter in volts

I-Reading of the ammeter in amps

Stray currents flowing in the soil shall produce serious errors in the measurement of earth resistance. To eliminate this, hand driven generator is used.

If the frequency of the supply of hand driven generator coincides with the frequency of stray current, there shall be wandering of instrument pointer. An increase or decrease of generator speed shall cause this to disappear.

At the time of test, the test electrode shall be separated from the earthing system.

The auxiliary electrodes shall be of 13 mm diameter mild steel rod driven up to 1 m into the ground.

All the three electrodes shall be so placed that they are independent of the resistance area of each other. If the test electrode is in the form of a rod, pipe or plate, the auxiliary current electrode C shall be placed at least 30m away from it and the auxiliary potential electrode' B' shall be placed mid-way between them.

Unless three consecutive readings of test electrode resistance agree, the test shall be repeated by increasing the distance between electrodes A and C up to 50m, and each time placing the electrode B mid-way between them.

All body earthings of one equipment shall be interconnected.

O) TERMINATION AND JOINTING OF CABLES

Use of Lugs/Sockets

All cable leads shall be terminated at the equipment terminals, by means of crimped type solder less connectors unless the terminals at the equipment ends are suitable for direct jointing without lugs/sockets.

The following is the recommended procedure for crimped joints and the same shall be followed:

i) Strip off the insulation of the cable end with every precaution, not to severe or damage any stand. All insulation to be removed from the stripped portion of the conductor and ends of the insulation should be clean and square.

ii) The cable should be kept clean as far as possible before assembling it with the terminal/socket. For preventing the ingress of moisture and possibility of re-oxidation after crimping of the aluminium conductors, the socket should be fitted with corrosion inhibiting compound. This compound should also be applied over the stripped portion of the conductor and the palm surface of socket.

iii) Correct size and type of socket/ferrule/lug should be selected depending on size of conductor and type of connection to be made.

iv) Make the crimped joint by suitable crimping tool.

v) If after crimping the conductor in socket/lug, same portion of the conductor remains without insulation the same should be covered sufficiently with PVC tape.

General condition for painting

All the steel materials such as angle iron, flats etc. shall be painted with one or more coat of epoxy primer and two coat of good quality epoxy paint of approved make(Asian/Berger/Nerolac) and shade shall be approved by Engineer-in-charge. The painting should be done at site only.

P) SPECIFICATION FOR GUIDANCE SIGN BOARD

Scope

Specification covers the requirement of internally illuminated guidance signs for day or night use at Airport.

Applicable Specifications

- ICAO Annexure 14 - Aerodrome Design & Operations
- FAA Specifications.

Classification

Mandatory Signs / Informative Signs - Colour of back ground and lettering shall be as per ICAO Annexure -14 and Aerodrome Design Manual Part IV & V.

Detailed Requirements Assembly

The assembly of signs shall be essentially consisting of a legend, which shall be housed, in a metallic housing / cabinet. The sign board assembly shall consist of cabinet mounted on frangible legs complete in all respect ready to be installed / fixed on ground or concrete block at site.

The main body of the sign cabinet is manufactured from corrosive resistant aluminum extrusions. The extrusions are interlocked with each other creating a sealed unit. This unit then has cross members and side panels secured, giving the compartment its strength. Prior to the assembly of the main cubical, all the metal work is anodized and powder coated in RAL 1007 aviation yellow providing a hard wearing, durable gloss finish.

The fascia framework is also manufactured from corrosive resistant aluminium extrusions. It is mounted and secured onto the front of the sign by the use of a quick release stainless steel clasps. A neoprene rubber gasket is fixed to the front fascia making a weatherproof seal of the complete unit to a rating of IP65. The sign fascia is hinge mounted to the main casing to provide quick and easy access for maintenance and lamp change. If required the whole sign fascia can be lifted free from the casing to provide full, unrestricted access to the main casing. Use of white or yellow painting for LED type TGS is also accepted subject to meeting the ICAO requirement.

These Sign boards designed for continuous outdoor operations under following conditions:-

Temperature: An ambient temperature range from - 2°C to + 55°C. Wind: Wind velocity as per Annexure 14 & Design Manual Part 4 & 5. Rain: Exposure to driving rains.

Size

Overall size (length and breadth) of each signboard shall be determined based on the message to be in-scripted / conveyed on the facia. Width and height of each letter shall be in accordance with ICAO Annexure 14 and Aerodrome Design Manual Part IV & V.

Note

For the purpose of payment of guidance signboards, measurement of board shall be done as per front face area of sign cabinet only (in sq. mtrs.), irrespective of supporting legs.

Front Panel

The legend fascia comprises of four layers. The main layer is opaque in colour and manufactured from UV stabilized 4mm polycarbonate preventing it from shattering or cracking when hit by flying objects, i.e. stones picked up in a jet blast wash. The remaining layers make up the colours and characters of the sign front, all covered in an anti-vandal, non-reflective translucent fascia Manufacturer type / Routine test certificate for polycarbonate sheet shall be produce at the time of pre-delivery inspection of sign boards and copy of the same shall be submitted along with the delivery of sign boards.

Frangibility

It shall be in accordance with FAA specifications to avoid damage to the aircraft, if inadvertently struck, yet must be sufficiently rigid withstand wind loads / jet blast from wide-bodied aircrafts. The mounting legs shall be frangible which will withstand wind loads due to jet blast as specified in ICAO Annex 14.

Sign

Signs shall be single sided / viewed internally illuminated with LEDs and all other accessories including suitable current converter / inverter to be operated on 2.8 Amp. to 6.6 Amps. These shall be designed for operation from a series airfield lighting circuit fed from a constant current regulator. The illumination shall be uniform over the sign face and visible at night time from a distance of 800 ft. Lights shall be readily accessible for replacement. Signs made in multiple sections shall appear to the viewer as a single sign with a continuous border and legend. The spacing, stroke and shape of legends and symbols shall be in accordance with ICAO specification. The signs designed shall be capable of being energized at the lowest current setting and operated at any current value between 2.8 to 6.6 Amps without flickering or an appreciable decrease in sign illumination. Power input from the series light circuit shall be made through an isolating transformer of proper rating. Average output luminance shall be in accordance with ICAO Annexure 14.

LEDs

The high intensity heavy duty LED lamps are to be used for the internal illumination of the sign boards. LED lamps shall be of long life typical 70000 Hrs. type, minimum luminous flux (either more than 150 lumens per LED, colour temperature 5000 - 7000 Kelvin or 18 lumens per LED, colour temperature 6000-6200 Kelvin). Adequate number of LEDs are to be used in order to achieve uniform illumination as per ICAO specification. The LED shall be provided with adequate size of heat sink for effective heat dissipation

Secondary Leads

2 x 4 sq. mm neoprene rubber secondary cable shall be used with factory moulded two pin connector of required length protected with flexible pipe for connecting the internal circuitry and the Isolating Transformer. Similarly the lead from circuitry to the lamp shall also be done through water proof arrangement. All wiring components shall be adequately rated and shall not be operated in excess of component manufacturer recommended raring.

Wiring

All wiring and electrical components shall be adequately rated and shall not be operated in excess of the component manufacturer's recommended ratings.

Materials and components

All materials used in fabrication of the signs shall be suitable for the intended purpose and adequately protected against corrosion. All assembly hardware, including screws, bolts, nuts, washers, and latches, shall be of stainless steel.

Workmanship

The equipment shall be fabricated in accordance with the highest quality workmanship. Wiring shall be neatly run and laced. All sharp and burrs shall be removed. Painted / treated surfaces shall be free from runs, blotches and scratches.

Test

The firm shall submit test certificates from reputed / Govt. Approved test laboratory to the following tests during the submission of tender document:-

(i) Rain Test

Equipment shall be tested to ensure that during rain, no water enters inside the housing and the rain shall not affect the performance of the unit.

(ii) High Temperature Test

A high temperature test shall be conducted on the sign and adapter unit. The maximum chamber temperature shall be 55°C. Failure of the unit to operate or evidence of damage shall be cause for failure.

(iii) Low Temperature Test

A low temperature test shall be conducted on the sign and adapter unit. The lowest operating temperature shall be (-) 2°C. Failure of equipment to operate or failure to reach normal sign illumination within 02 minutes after it is energized shall be cause for failure.

(iv) Uniformity of Illumination Test

The illumination level has to be achieved as per ICAO requirements.

(v) Insulation Test

The insulation resistance of electrical component of assembly shall be tested for insulation value with 500V Megger.

Grouting

Mounting stud frame shall be grouted with 1:2:4 cement concrete 150mm all around the frame and for not less than 400mm height.

Pedestal

Cement concrete of ratio 1:2:4 with 150mm thick Pedestal shall be provided in and around the Guidance sign boards 1500mm from the edges of sign.

Others

The details of signs required shall be given to the successful tenderer along with award of work. The tenderer should submit detailed drawing showing length, breath, height, arrangement etc. of each type of sign board and calculated area of surface for approval before starting fabrication.

Overall size [length and height] of each sign board shall be determined based on the message to be in scripted on the facia. Width and Height of each letter shall be in accordance to ICAO Annex 14 and Aerodrome Design Manual Part IV.

All illuminated sign boards shall be equipped with double drive, so that at least 50% LED shall work during failure of one driver.

Q) WIND DIRECTION INDICATOR

The wind direction indicator shall fully comply with the ICAO standards. At the wind speed of at least 28 km/hour the sleeve shall inflate and thus visually indicate wind direction and speed. The mast shall comply with the following specifications.

Sl. No.	Parameter	Specification
1	Material of construction	➢ U.V. Resistant ➢ Fire Retardant ➢ Non-Corrosive ➢ Light Weight FRP
2	Anti-corrosion	Special Polymer Resin with resistance to Saline Water, Air & Acidic fumes
3	Frangibility	Must meet Frangibility criteria as per: ➢ Federal Aviation Administration Advisory Circular No. FAA AC 150/4345 - 45C ➢ ICAO guidelines Aerodrome Design Material Part - 6 Frangibility Doc 9157 First Edition - 2006 chapter 5
4	U V Resistance	Test Report for weathering as per ASTM G154 for 1500 Hours minimum with testing tensile strength test & flexural strength which shall not reduce by more than10% after UV exposure. (Considered Equivalent to 15 Years outdoor life)
5	Flexural Strength (LW)	Min 350 N/mm2 as per ASTM D790
6	Tensile Strength (LW)	Min 300 N/mm2 as per ASTM D638
7	Wind Speed	Wind loading test as per: ICAO Aerodrome design Manual DOC 9157AN/901 Part 6 – Frangibility Subsection 3.2.2 and 4.9.14 Federal Aviation Administration (FAA), Advisory Circular No. 150/5345-45, Section 3.3.1
8	External lighting	LED light assembly mounted on top (04 Nos. of LED lights)
9	Obstruction light	Single LED obstruction light to be provided
10	Approved make (Category - 2)	Any manufacturer meeting ICAO standards/ specification for the product.

Type test certificates for parameters in Sl. No. 3 to 7 above shall be submitted to AAI during material approval stage.

Contractor / Agency is advised to visit the site and familiarize himself with Geographical area where the said poles are intended to be installed. Accordingly, the foundation details as per recommendations of OEM shall be submitted to AAI prior to execution of foundation work. However, if site demands for any enhanced requirements in foundation works same shall be carried out without any extra cost to AAI by the contractor.

Care to be taken for proper positioning of template and J bolts, curing works of foundation.

The work of supplying & embedding DWC pipe in above foundation for cable entry into supplied structure is also included in the scope of work called for in this contract. DWC pipe supplied under different BOQ shall not be used for this purpose of embedding work in foundation.

The work shall be carried out as per good engineering practices and to the satisfaction of E.I.C completely as required and as per site requirements.

LIST OF PREFERRED MAKES

The preferred makes are listed below:

i. Brand names of materials to be used are listed here and indicative only. Mere inclusion of brand name in this list does not guarantee for use in work unless specification of brand meets technical specifications of product as stipulated in tender document. The specifications of the products as mentioned in this tender document shall take preference over the make list. The contractor will be required to provide items/material as per the specifications indicated in tender document.

ii. The following list of preferred makes is exhaustive. However, additional manufacturers or brands may be considered for any specified product or item, depending on market availability, delivery timelines, and proven satisfactory performance in similar projects or works-preferably where such a make or product has been used in quantities constituting at least eighty percent (80%) of the estimated or proposed requirement for the relevant project or work. To establish performance, completion certificates, performance certificates and purchase orders accompanied by tax invoices will be considered, provided that the products comply with the technical specifications stipulated in the tender document."

iii. In case, Model no. of any product as mentioned in tender document is discontinued by manufacturer (documentary evidence from manufacturer is must to establish this), then contractor is bound to provide latest model of same manufacturer subject to meeting the technical specification without any financial implication.

iv. The tenderers shall quote his rates on the basis of the price for the best quality product of the brand/make stipulated for the item of work in the list of preferred make/specifications. The agency shall submit at least three brands from the list given below along with the rates (having price variation within 10%) and specifications for the approval of Engineer- In-charge before placing order. EIC shall approve any of the two brands.

LIST OF PREFERRED MAKES			
Sl. No.	**Name of Product / item**	**Proposed Brands / Makes / Manufacturers**	
1	CEMENT	ACC Ltd. / Ultra Tech / Shree Cement Ltd. / Ambuja / Jaypee / Century /J.K.Laxmi (JK Lakshmi Cement Ltd.) / JK Cement / Nuvoco / Dalmia Cement (Bharat) Ltd. / Birla A1 (Orient cement Ltd.) / Star Cement / PENNA / Max Cement / Ramco Cement / Chettinad Cement / Wonder (Wonder Cement Limited) / JSW Cement / Zuari Cement / Prism Cement	
2	TMT REINFORCEMENT STEEL	SAIL / RINL (VIZAG Steel) / TATA TISCON (TATA Steel Limited) / JSW Steel Ltd. / JSPL / Shyam Steel Industries Ltd. / ESL Steel Ltd. / Shyam Metalics & Energy Ltd. / Shri Bajrang Power & Ispat Ltd. / Rashmi Metaliks Limited / SRMB Srijan Private Limited / MS Agarwal Foundries Private Limited / Real Ispat and Power Limited / Jai Balaji Industries Limited / Maithan Steel & Power Limited/Shree Nakoda Ispat Limited	
3	STRUCTURAL STEEL-MS TUBULAR SECTIONS (CIRCULAR, SQUARE, RECTANGULAR) FOR COLUMNS, TRUSS, MS PIPES, FLATS, ANGLES, BEAMS, CHANNELS, STRIPS ETC.	SAIL / RINL (VIZAG Steel) / TATA Structura (TATA Steel Limited) / JSW Steel Ltd. / JSPL / APL Apollo Tubes Ltd. / Shyam Metalics & Energy Ltd. / Surya Roshni Ltd.	
		Nezone Tubes Ltd. / Utkarsh India Ltd. / Hi-Tech Pipes Ltd.	For works costing up to 15 Cr works
4	VITRIFIED /CERAMIC TILES	Prism Johnson Limited (H&R Johnson (India) Ltd.) / NITCO Tiles Ltd. / Orient Bell Ltd. / Oracle Granito Ltd. / Kajaria Ceramics Ltd. / RAK Ceramics (RAK Ceramics Ltd.) / AGL (Asian Granito India Ltd.) / Oasis Vitrified Tiles (Oasis Vitrified Pvt. Ltd.) / Varmora Granito Pvt. Ltd. / Qutone Ceramic Pvt. Ltd. / Ambani Vitrified Pvt. Ltd. / Simpolo Vitrified Pvt. Ltd. / Pavit Ceramics Pvt. Ltd. / Aparna Enterprises Ltd. / SUNHEAART CERAMIK (Sunshine Tiles Company Pvt. Ltd)	
5	ALUMINIUM STANDING SEAM ROOFING SYSTEM	KALZIP (Kalzip India Pvt. Ltd.) / Kingspan (Kingspan Jindal Pvt. Ltd) / BEMO (Bemo System GmbH) /	
		New Look Furnishers (For roofing work upto 15,000 sqm)	

6	METAL CEILING TILE/BAFFLE CEILING	Hunter Douglas India Pvt. Ltd. / Durlum India Pvt. Ltd. / Saint Gobain Gyproc India Ltd. / Knauf Ceiling Solutions (India) Pvt. Ltd. (Formerly Armstrong World Industries (India) Pvt. Ltd.) / USG Knauf (Knauf India Pvt. Ltd.) / Dexune (Dexune Marketing Pvt Ltd.) / Ceiflo Technologies Pvt. Ltd./ New Age FalseCeiling Pvt. Ltd.
7	GALVALUME/STEEL SHEET ROOFING (TOP & BOTTOM) OVER M.S. STRUCTURE	Tata Bluescope Steel Ltd. / Jindal Steel (Jindal India Ltd.) / JSW Steel Coated Products Limited / APL Apollo Building Products Private Limited / Colorshine Coated Pvt. Ltd.
8	ALUMINIUM COMPOSITE PANELS (ACP)	Alucobond (3A Composite India Pvt. Ltd.) / Alstrong Enterprises India Pvt. Ltd. / Aludecor Lamination Pvt. Ltd / EUROBOND (Euro Panel Product Ltd.) / Alstone (Alstone International) / VIVA(Viva Composite Panel Pvt Ltd.) / Alutech(Alutech Industries) / VIRGO(Virgo Laminates Ltd.) / Alutuff(Ashoka foam multiplast Pvt. Ltd.) / Alexia Panels / Timexbond Industries Pvt. Ltd.
9	HONEYCOMB COMPOSITE PANELS (HCP)	Alucobond (3A Composite India Pvt. Ltd.) / Aludecor Lamination Pvt. Ltd / EUROBOND (Euro Panel Product Ltd.) / Alstone (Alstone International) / VIVA (Viva Composite Panel Pvt Ltd.) / Alutuff(Ashoka foam multiplast Pvt. Ltd.)
10	ZINC COMPOSITE PANELS (ZCP)	Aludecor Lamination Pvt.Ltd / Alstone (Alstone International) / VIVA (Viva Composite Panel Pvt Ltd.) / EUROBOND (Euro Panel Product Ltd.)/
11	ALUMINIUM EXTRUSIONS / STRUCTURAL MEMBERS	Hindalco Industries Ltd. / Jindal Aluminium Ltd. / Bhoruka (Bhoruka Extrusions Pvt. Ltd.) / NALCO/
12	FLOAT GLASS / HIGH PERFORMANCE GLASS	Saint Gobain Glass India Ltd. / AIS Glass Solution Ltd / Pilkington / Guardian Sun Guard /Modi Guard (Gujarat Guardian Limited) / Sisecam Flat Glass India Pvt. Ltd. / Gold Plus Glass Industry Ltd. / TPRS Enterprises Pvt. Ltd./ Atul Ltd.
13	UPVC DOORS & WINDOW	Aparna venster /Okotech(Aparna Enterprises Ltd.) / Fenesta(Fenesta Building Systems) / Aluplast / NCL Veka Ltd. / Window Magic India Pvt. Ltd. / Rajshri Plastiwood
14	WOOD POLYMER COMPOSITE(WPC)	ECOBOARD (Alstone Industries Pvt. Ltd.) / Rajshri Plastiwood (Div. of Rajshri Productions Pvt. Ltd.) / KAKA Industries Ltd.

15	ADMIXTURES /WATER PROOFING COMPOUND/ ACRYLIC CEMENTITIOUS COATING/ LIQUID MEMBRANE (POLYURETHANE & POLYUREA)/HDPE & SELF-ADHESIVE MEMBRANE	Pidilite Industries Ltd. / FOSROC Chemicals (India) Pvt. Ltd. / CICO Technologies Ltd. / Sika India Pvt. Ltd. / BASF India Ltd. / MC-Bauchemie (MC-Bauchemie India Pvt. Ltd.) / Ardex Endura (India) Pvt. Ltd. / STP Ltd. / Choksey Chemicals Pvt. Ltd. / MYK Laticrete (MYK Laticrete Pvt. Ltd. / Mapei (Mapei Construction Products Pvt. Ltd) / Chryso India Pvt. Ltd. / Maruti Bitumen Pvt. Ltd. / Penetron India Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd. / Asian Paints Ltd. / IWL India Ltd. / TP Buildtech Pvt. Ltd. / MYK Arment Pvt. Ltd. / Technonicol India Pvt. Ltd. / Saint-Gobain India Pvt. Ltd. / Ferrous Crete (India) Pvt. Ltd. / Fair Mate Chemicals Pvt. Ltd. / Berger Paints India Ltd./ Yashka Polymers Pvt. Ltd./ Hindcon Chemicals Ltd/ Buildtech Products India Private Limited/ Kryton Buildmat Co. Pvt. Ltd./ Kunal Conchem Pvt Ltd/ Bostik India Private Limited/ M.K Petro Products India Private Limited/ Prism Johnson Limited/ Boxer Construction Chemicals/ Ado Additives Technologies Limited/ Sunanda Speciality Coatings Pvt Ltd/ Tikitar Danosa (India) Pvt Ltd
16	BIPOLAR CORROSION INHIBITOR ADMIXTURE	STP Ltd. / Sika India Pvt. Ltd. / BASF India Ltd. / Chryso India Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd./ Sunanda Speciality Coatings Pvt Ltd/ Conchem labs LLP/ Fosroc Chemicals (India) Private Limited
17	REINFORCEMENT COUPLER	Dextra / G-Tech / HI-Tech Engineering Solutions / Sanfeild (India) Ltd./ Tata Steel Limited
18	HARDWARE FITTING	Dormakaba India Pvt. Ltd. / Q-Railing India Pvt. Ltd. (Formely D-Line) / Hafele India Pvt. Ltd. / GEZE Gmbh / Linox Technology Pvt. Ltd. / Assa Abloy / Kich Architectural Products Pvt. Ltd. / Godrej & Boyce / LGF Sysmac India Pvt. Ltd. / Rinox Kaufmann Ltd. / Ozone India Pvt. Ltd. / Everite / Define / Hardwyn (Hardwyn India Ltd.) / Arkay / Dorset Industries Pvt. Ltd. / Prayag Polymers Pvt. Ltd. / Hettich India Pvt. Ltd. / Ozone Overseas Pvt. Ltd.
19	STEEL/WOOD FIRE RESISTANT SHUTTER	Navair Ltd. / Pormat International Ltd. / Shakti Hormann Pvt. Ltd. / Sukri Paints & Chemicals / Iclean / Signum Fire Protection / Pacific (Pacific Fire Controls Pvt. Ltd.) / ASES Security Pvt. Ltd.
20	LAMINATES/ LAMINATED PARTICLE BOARD/ PRELAMINATED BOARD/ MDF/ PLY BOARD/FLUSH DOORS/ COMPACT LAMINATE/ TOILET CUBICAL/ URINAL PARTITIONS	Greenlam Industries Ltd. / Merino Industries Ltd. / Century Plyboard (I) Ltd. / Nationl Ply / Archidply (Archidply Industries Limited) / Kitply Industries / Novapan / Duro / Mayur Doors / Greenply / ASIS / Greenpanel Industries Limited / Punjab Plywood Industries / Stylam Industries Ltd./ Bobrick Washroom Equipment Inc./ Dormakaba India Pvt. Ltd./ Trespa/ T-Line (Inner Space)/ Samrat Plywood Limited/ Jain Doors Pvt. Ltd./ Jain Wood Industries/ Arjnwoodmart Private Limited/ Virgo Laminates Ltd
21	FASTENERS/ANCHOR FASTENERS	Hilti (Hilti (India) Pvt. Ltd.) / Fischer / BOSCH / Fasteners India / Mungo / Rawl Plug/ Koncept Steel Private Limited/ Axel India/ AFT (Anchorite Fixing Technology)

22	WOODEN LAMINATED FLOORING/ VINYL FLOORING / RUBBER FLOORING	Pergo Ltd. / Action Tesa / Unitex / Knauf Ceiling Solutions (India) Pvt. Ltd. (Formerly Armstrong World Industries (India) Pvt. Ltd.) / Epitome / Scheit / Responsive Industries Ltd. / Greenlam Industries Ltd. / Greenpanel Industries Ltd.
23	EPOXY/PU FLOORING	STP Ltd. / Sika India Pvt. Ltd. / BASF India Ltd. / FOSROC Chemicals (India) Pvt. Ltd. / Tremco CPG (India) Pvt. Ltd. / Cipy Polyurethanes Pvt. Ltd / NITCO Tiles Corp. / Maruti Bitumen Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd. / Chryso India Pvt. Ltd. / Saint-Gobain India Pvt. Ltd. / Bostik India Pvt Ltd. / Asian Paints Ltd. / Pidilite Industries Ltd. / Berger Paints India Ltd. / MYK Arment Pvt. Ltd./ Hygie Profile India Pvt Ltd/ Sunanda Speciality Coatings Pvt Ltd
24	TILE JOINT FILLER, TILE/AAC BLOCK/ STONE FIXING ADHESIVE/ SOLID EPOXY GROUT	Ardex Endura (India) Pvt. Ltd. / Ferrouscrete India Pvt.Ltd / MYK Laticrete (MYK Laticrete Pvt. Ltd.) / Pidilite Industries Ltd. / FOSROC Chemicals (India) Pvt. Ltd. / BASF India Ltd. / Fairmate(Fair Mate Chemicals Pvt.Ltd.) / STP Ltd. / Home Pride Adhesive Pvt. Ltd. / Saint-Gobain India Pvt. Ltd. / Berger Paints India Ltd. / Somany Ceramics Ltd. / Ultratech Cement Ltd/ Kerakoll India
25	FLOOR HARDENER	STP Ltd. / Sika India Pvt. Ltd. / BASF India Ltd. / Pidilite Industries Ltd. / FOSROC Chemicals (India) Pvt. Ltd. / Ironite / Mapei (Mapei Construction Products Pvt. Ltd.) / Chryso India Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd. / Saint-Gobain India Pvt. Ltd. / MYK Arment Pvt. Ltd.
26	POLYCARBONATE SHEET	Lexan/Sabic (GE Plastic) / Dan Pal / Polygal India Pvt. Ltd. / Gallina India Pvt. Ltd. / Coxwell Domes (Coxwell Domes Engineers Pvt. Ltd.) / Tuflite / DPI Daylighting Pvt Ltd.
27	CALCIUM SILICATE /MINERAL FIBER FALSE CEILING TILES/GYPSUM FALSE CEILING BOARDS/ PARTITION BOARDS	Saint Gobain Gyproc India Pvt. Ltd. / Llyod Insulation India Ltd. / Knauf Ceiling Solutions (India) Pvt. Ltd. (Formerly Armstrong World Industries (India) Pvt.Ltd./Knauf AMF India Pvt. Ltd.) / Aerolite Ceiling System/Andhra Polymers Pvt. Ltd. / USG Knauf (Knauf India Pvt Ltd.) / Hilux (Ramco Industries Ltd) / Gridline / Everest / Dexune (Dexune Marketing Pvt Ltd.) / Vans Gypsum / New Age False Ceiling Pvt. Ltd.
28	FIBER CEMENT BOARD/ CEMENT BOARD	Bison (NCL Industries Ltd.) / Hicem (Ramco Industries Ltd.) / Everest (Everest Industries Ltd.) / Visaka Industries Ltd.
29	PAINTS FOR STEEL STRUCTURE (EPOXY PAINTS)/ PU PAINTS/ WATER PROOF CEMENT PAINTS/ PRIMER/ DISTEMPER/ TEXTURE FINISH PAINT/ SYNTHETIC ENAMEL PAINT/ FIRE RETARDANT PAINT	JSW-Akzo Nobel India Pvt. Ltd. / Jenson & Nicholson / Oikos India Pvt.Ltd. / Asian Paints Ltd. / Berger Paints India Ltd. / Nerolac / Acro Paints Ltd. / Snowcem India Ltd. / Shalimar (Shalimar Paints Ltd.) / Jotun / Grauer & Weil (India) Ltd. / STP Ltd. / Hempel Paints India Pvt. Ltd./ Anupam Enterprises/ Dooall Corpro India Pvt Ltd/ Nippon Paint India Private Limited/ FOSROC Chemicals (India) Private Limited

30	WALL PUTTY	J.K.Cement / Toyo Ferrouscrete India Pvt. Ltd. / Birla White / Dalmia Magic Premium Skim Coat(Dalmia Cement (Bharat) Ltd.) / Asian Paints Ltd. / NCL Buildtek Pvt. Ltd. / Ferrous Crete(India) Pvt. Ltd. / Saint-Gobain India Pvt. Ltd./ Nippon Paint India Private Limited
31	EXPANSION JOINT FILLER BOARD/ JOINT COVERS	Vexcolt International Ltd. (U.K) / Construction Specialities (USA) / The Supreme Industries Ltd. / STP Ltd. / Dupont / Sanfeild / Hercules / Z-Tech / DECG International / M.M.Systems / Kantaflex-Balco (Kantaflex (India) Pvt. Ltd.) / Mapei(Mapei Construction Products Pvt. Ltd.) / Migua / Insuboard / Soprema / Supreme Bituchem India Pvt. Ltd./ Pinnacle Solutions / VR Engineers
32	GLASS GRID FOR BITUMINOUS WORKS	Saint Gobain ADFORS / Maccaferri Environmental Solutions Pvt. Ltd. / Techfab Industies Ltd. / Giridhar Techfab Pvt. Ltd. / Terrain Infratech / Flexituff International Ltd. / Supreme Non-Woven Ind. Pvt. Ltd./ Polyon Textiles Private Limited
33	RUNWAY MARKING PAINT (WATER BASED)	Nerolac / Berger Paints (Berger Paints India. Ltd.) / Asian Paints Ltd. / ITS Coating Pvt.Ltd. / Supreme Bituchem India Pvt. Ltd. / STP Ltd.
34	SANITARY WARE/ FIXTURE/ FITTINGS/ SS SINK/ SPECIALLY ABLED FITING	Kohler Co. (USA) / Jaquar and Company Pvt. Ltd. / American Standard / HINDWARE / QUEO (Hindware limited) / PARRYWARE / ROCA (Roca Bathroom Products Pvt. Ltd.) / Grohe AG (Germany) / Franke (Switzerland) / Bobrick Washroom Equipment Inc. / Duravit / Marc / H&R Johnson (India) Ltd/Prism Johnsons Ltd. / CERA/Senator (Cera Sanitaryware Ltd.) / Somany Ceramics Ltd. / Dolphy India Pvt. Ltd. / Rak Ceramics India Pvt. Ltd /Nirali (Jyoti Kitchen Industries pvt. Ltd.)/ Jayna/ Pressalit Ltd./ Hindustan/ Aqua Plumbings Pvt Ltd/ Astral Ltd/
		Euronics (Euronics Industries Pvt.Ltd.) (Except SS Napkin and Soap Dispenser)
35	G.I. PIPE FITTINGS	Unik / Zoloto Malleables / Leader Valves Ltd. / Surya / R-Brand / KS / SS
36	SOIL WASTE & VENT PIPES & FITTINGS AND WATER SUPPLY PIPES-SAND CAST IRON S&S/ CENTRIFUGALLY CAST (SPUN) S&S/ HUBLESS CENTRIFUGALLY CAST SPUN IRON PIPES/ CENTRIFUGALLY (SPUN) CI PIPES CLASS 'LA'/ DUCTILE IRON PIPE/ CI MANHOLE COVERS & CI GRATING	NECO (Jayaswal Neco Industries Ltd.) / BIC (Bengal Iron Corporation)/ RIF / Electrosteel Steels casting Ltd. / SKF / Kapilansh Dhatu Udyog(P) Ltd. / Saint Gobain / HEPCO (Binay Udyog Pvt Ltd.) / Raj Pattern Makers & Founders Pvt. Ltd.
37	STRUCTURAL/ WEATHER SEALANT FOR STRUCTURAL GLAZING/ACP	Wacker / Dow corning / G.E. Plastics / Pidilite Industries Ltd. / FOSROC Chemicals (India) Pvt. Ltd. / BASF India Ltd. / STP Ltd. / Rawl Plug / Choksey Chemicals Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd. / Maruti Bitumen Pvt. Ltd. / Sika India Pvt. Ltd./ Alstone Industries Pvt. Ltd.

38	POLY SULPHIDE / POLYURETHANE SEALANT FOR JOINTS	FOSROC Chemicals (India) Pvt. Ltd. / Choksey Chemicals Pvt. Ltd. / Pidilite Industries Ltd. / Sika India Pvt. Ltd. / Dow corning / MYK Laticrete (MYK Laticrete Pvt. Ltd.) / Tuffseal / Wacker / G.E. / STP Ltd. / BASF India Ltd. / Maruti Bitumen Pvt. Ltd. / Chryso India Pvt. Ltd. / Supreme Bituchem India Pvt. Ltd. / Bostik India Pvt Ltd / MYK Arment Pvt. Ltd. / McCoy Soudal Sealants Adhesives & Foams Pvt. Ltd.
39	MODULAR S.S. /GLASS RAILING	Dormakaba India Pvt. Ltd. / Jindal Lifestyle Ltd. / GEZE Gmbh / Q-Railing India Pvt. Ltd. (Formerly D-Line) / Linox Technologies Pvt. Ltd. / Kich Architectural Products Pvt. Ltd. / Ozone India Pvt. Ltd. / Assa Abloy / Rinox Kaufmann Ltd. / Maruti Architectural Products Pvt. Ltd.
40	SOLID ACRYLIC SURFACE BOARDS	Dupont / LG-Himacs (LX Hausys India Pvt. Ltd) / Hanex / GMGR India (Samsung Staron) / Neonnex/ Durlax Top Surface Limited/
41	TENSILE FABRIC	Mehler Texnologies (Low & Bonar India Pvt. Ltd.) /Serge Ferrari India Pvt. Ltd. / Sattler PRO-TEX
42	AUTOCLAVED AERATED CEMENT (AAC) BLOCKS	Magicrete Building Solutions Pvt. Ltd. / Finecrete Eco-Blocks Pvt. Ltd. / Aerocon / Bilt Technologies / JK / Instablock / Max Blocks / RS Green Infra (India) Pvt. Ltd. / Siporex / Kataria Ecotech. Pvt. Ltd. / Krrish White Bricks LLP / Jindal AIR / NCL Buildtek Pvt. Ltd./ Renaatus Procon Private Limited (Remark: Apart from these makes, locally available makes may be explored meeting technical specifications)
43	AUTOMATIC REVOLVING / SWING DOOR	Dormakaba India Pvt. Ltd. / Hafele India Pvt. Ltd. / GEZE Gmbh / Gilgen Door System AG / Linox Technology Pvt. Ltd. / Assa Abloy / Autoingers
44	WALKWAYS/FALL PROTECTION SYSTEM/ ROOF HATCH	WULMET / Latchways (Fall Arrest Systems & Technologies Pvt. Ltd.) / Capital Safety / Honeywell / Checkmate / Karam Safety Pvt. Ltd. / Kingspan Jindal Pvt. Ltd. /NYSTROM/ BABENKO/ BILCO
45	GYPSUM PLASTER/ POLYMER MODIFIED SELF CURING MORTAR	Ferrous Crete (India) Pvt. Ltd. / Ultra Tech / Saint Gobain Gyproc India Ltd. / Dow Construction Chemicals / BASF India Ltd. / Asian Paints Ltd. / Saint-Gobain India Pvt. Ltd./ Dudhi Industries Private Limited
46	CURING COMPOUND (RESIN BASED & WAX BASED)	FOSROC Chemicals (India) Pvt. Ltd. / Sika India Pvt. Ltd. / BASF India Ltd. / Supreme Bituchem India Pvt. Ltd. / CICO Technologies Ltd. / STP Ltd. / Berger Paints India Ltd. / Yahska Polymers Pvt Ltd/ Akarsh Specialities
47	DECORATIVE FILMS/ SAFETY FILMS	3M / Avery Dennison / Deck
48	STEEL NANO COAT	Four Solutions Pvt. Ltd. / Meta-Chem Paints & Adhesives Pvt. Ltd. / Advanced Lab

49	GEOTEXTILE PRODUCTS/ SOIL REINFORCEMENT GEOSYNTHETICS	TechFab India Industries Ltd. / Strata Geosystems (India) Pvt. Ltd. / Suntech Geotextile Pvt. Ltd./ Maccaferri Environmental Solutions/
	SOIL REINFORCEMENT GEOSYNTHETICS	Maccaferri Environmental Solutions Pvt. Ltd. / Strata Geosystems (India) Pvt. Ltd. / Tech Fab India Industries Ltd.
50	UPVC/CPVC/SWR PVC PIPES & FITTINGS	The Supreme Industries Ltd. / Finolex Industries Ltd / Savoir Faire Manufacturing Co. Pvt. Ltd. / AKG Extrusions Pvt Ltd. / Surya Roshni / Astral / Prince / Ori-plast / Ashirvad / Vectus / Prayag (Prayag Polymers Pvt. Ltd.) / Balco / Texmo Pipes and Products Ltd./ HIL Limited/ Vishal Pipes Limited
51	ROCKWOOL / GLASSWOOL INSULATION	UP Twiga / Roxul-Rockwool / Rockloyd / Saint Gobain India (Formerly Rockwool India) / Lloyd Insulations India Ltd. / Polybond Insulation Pvt. Ltd./Hi-Tec Rock Fibre Private Limited/ Thermocare Rock Wool (India) Pvt. Ltd.
52	G.I. PIPE	Tata Steel Ltd. / Jindal Pipes Ltd. / Surya Roshni (Surya Roshni Ltd.) / APL Apollo Tubes Ltd. / Zenith / Utkarsh India Ltd. / Nezone Tubes Ltd. / Hi-Tech Pipes Ltd. / Jotindra Steel & Tubes Ltd./ Ravindra Tubes Private Limited/ Dadu Pipes Pvt. Ltd/ Vishal Pipes Limited/ Chetna Steel Tubes Private Limited
53	SLUICE VALVE/PRESSURE REDUCING VALVE/NON-RETURN VALVE (CI/GUN METAL)	Sant Valves Pvt. Ltd. / Zoloto / Audco(L& T) / Castle / Leader Valves Ltd. / Kartar / Honeywell / IVC
54	HDPE PIPES	Geberit / Saint Gobain / Savior Faire Manufacturing Co. Ltd. / Jain Irrigation / Ori-plast / East - Hooghly Agro Plantation Pvt. Ltd./ Aram Plastics Private Limited/ Shree Narayani Pipe Mfg Co/ Vishal Pipes Limited/ Prince Pipes And Fittings Limited/ Vishal Heavy Engineering Private Limited/ Sangir Plastics Pvt. Ltd.

LIST OF PREFERRED MAKES FOR ELECTRICAL ITEMS

Note: The following list of preferred makes is exhaustive. However, additional manufacturers or brands may be considered for any specified product or item, depending on market availability, delivery timelines and proven satisfactory performance in similar projects or works—preferably where such a make or product has been used in quantities constituting at least eighty percent (80%) of the estimated or proposed requirement for the relevant project or work. To establish performance, completion certificates, performance certificates and purchase orders accompanied by tax invoices will be considered, provided that the products comply with the technical specifications stipulated in the tender document.

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
A.	PANEL,SWITCHGEARS AND RELATED ITEMS		
1	LT PANELS (TTA)	MAK / SHIV SHAKTI ENGINEERS / TECHNOCRAFTS / TENCO / KONTACT / ABB / RISHA / MARINE ELECTRICALS / POWERTECH SWITCHGEARS / ULTIMA / RITTAL / URJAYANT/ EXCEL CONTROL SYSTEMS / BALAJI ELECTRO CONTROLS PVT LTD / KRUTI / CMKL(CORE METAL) / KEPL(KHOKHAR) / LEGRAND (NOVATEUR) / CONQUERENT / MITSUBISHI / LS POWER / ZENIYA / NEPTUNE / LAURITZ KNUDSEN / C&S / BCH / ADVANCE / TRICOLITE / SCHNEIDER / SUDHIR / EAP / TRISQUARE / MILESTONE / ADLEC / UNILEC / CONSOUL (RR ISPAT) / PEATON/ HAROLD/ SPC ELECTROTECH / SIEMENS	CATEGORY-1
2	LT PANELS / FEEDER PILLAR (PTTA) / BUS TRUNKING	EXPERT ENGINEERS / MAK / APPLICATION CONTROL PANEL / AMBIT / ADLEC / SHIV SHAKTI ENGINEERS / TECHNOCRAFTS / EXCEL CONTROL SYSTEMS / GLOBAL / SUPERTECH CONTROL SYSTEMS / SWITCHGEARS & FABRICATORS / KONTACT / MARINE ELECTRICALS / R.P. CONTROLS / GOURAV EnerGen / TENCO / POWERTECH SWITCHGEARS / HAROLD / BALAJI ELECTRO CONTROLS PVT LTD / URJAYANT / KRUTI / ASES / ITE-GURGAON (INDIAN TRANSFORMERS) / LEGRAND (NOVATEUR) / CONQUERENT / CORONET / RST ELECTRICALS PVT LTD / HPL / C&S / L.S POWER / ZENIYA / PRECISION / ABB / EAP / TRICOLITE / SUDHIR / SCHNEIDER / LAURITZ KNUDSEN / NEPTUNE / HENSEL / ADVANCE / KEPL(KHOKHAR) / PEATON / RISHA / TRISQUARE / CMKL (CORE METAL) / SPC ELECTROTECH / BCH / MILESTONE / YOGIJI DIGI (P) LTD / ELINS / EVA / UNILEC / HAROLD / ENGINEERS & ENGINEERS / SIEMENS / ULTIMA / NITYA	CATEGORY-1
3	AIR CIRCUIT BREAKERS	LS ELECTRIC / BCH / MITSUBHISHI / HPL / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / ABB / C&S / HAVELLS / SCHNEIDER / SIEMENS	CATEGORY-2
4	MOULDED CASE CIRCUIT BREAKERS (MCCB)	LS ELECTRIC / BCH / MITSUBHISHI / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / ABB / C&S / HAVELLS / INDO ASIAN (NOVATEUR) / HPL / SCHNEIDER / SIEMENS	CATEGORY-2
5	CHANGE OVER SWITCH/ FUSE DISCONNECTOR SWITCH/ SWITCH FUSE UNITS	BENTEC / BCH / INDO ASIAN (NOVATEUR) / SOCOMEC / LAURITZ KNUDSEN / C&S / LEGRAND (NOVATEUR) / HPL / ABB / HAVELLS / SIEMENS / SCHNEIDER	CATEGORY-2
6	METERS / MULTIFUNCTION METERS -ANALOGUE/DIGITAL	ELMEASURE / KRYKARD / SELEC / C&S / ABB / BENTEC / SELEC / C&S / MITSUBHISHI / ABB / NEPTUNE / SOCOMEC / HPL / LAURITZ KNUDSEN / FINDER / SIEMENS / SCHNEIDER / CONSERVE / SECURE	CATEGORY-3
7	SELECTOR SWITCH, PUSH BUTTON SWITCH / EMERGENCY SWITCH	ABB/ TRINITY TOUCH / LAURITZ KNUDSEN / C&S/ BCH/ EATON / TEKNIC / SIEMENS / SCHNEIDER	CATEGORY-3
8	CT's / PT's	GLOBAL / KRUTI / WAGO / CG POWER / SELEC / NEWTEK / ANANT POWER (ADVANCE) / KAPPA	CATEGORY-3
9	PROTECTIVE RELAYS (ALL TYPE)	P2 POWER / WAGO / SELEC / HAVELLS / MITSUBISHI / LAURITZ KNUDSEN / CG POWER / C&S / ABB / SIEMENS	CATEGORY-2
10	CONTACTORS	MITSUBHISHI / HPL / LAURITZ KNUDSEN / C&S / BCH / HAVELLS / ABB / TDK / SIEMENS / LEGRAND (NOVATEUR) / SCHNEIDER	CATEGORY-3
11	TIMERS / TIME SWITCH-ANALOGUE/DIGITAL	HAVELLS / LAURITZ KNUDSEN / SELEC / BCH / ABB / LEGRAND (NOVATEUR) / EATON / FINDER / SIEMENS / SCHNEIDER / C&S	CATEGORY-3
12	LED INDICATION LAMPS	EATON / OLIVE / ABB / LAURITZ KNUDSEN / C&S / BCH / VINAY LED / VAISHNOV / SCHNEIDER	CATEGORY-3

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
B.	SUBSTATION RELATED ITEMS		
13	TRANSFORMER UP TO 500 KVA (DRY/OIL)	POWERWARE / ITE, GURGAON / ESENNAR / PVJ POWER / TRANSCON / AMES IMPEX / POWER STAR / JAY BEE / RTS / CG POWER / SUDHIR / VOLTAMP / BHARAT BIJLEE / KOTSONS/ SCHNEIDER / KIRLOSKAR	CATEGORY-1
14	TRANSFORMER MORE THAN 500 KVA (DRY/OIL)	POWERWARE / ITE, GURGAON / ESENNAR / PVJ POWER / TRANSCON / AMES IMPEX / POWER STAR / JAY BEE / RTS / CG POWER / SUDHIR / VOLTAMP / KOTSONS/ SCHNEIDER / BHARAT BIJLEE / KIRLOSKAR / SIEMENS	CATEGORY-1
15	H T PANEL	APPLICATION CONTROL PANEL / SHIV SHAKTI ENGINEERS / ITE, GURGAON / TECHNOCRAFTS / TENCO / MARINE ELECTRICALS / PASCAL / KEPL(KHOKHAR) / CONQUERENT / RISHA / CORONET / L.S POWER / ZENIYA / EAP / CG POWER (CFPISL) / TRICOLITE / SUDHIR / LAURITZ KNUDSEN / ABB / TRISQUARE / SCHNEIDER / MILESTONE / EATON / ANANT POWER (ADVANCE) / ADLEC / SIEMENS	CATEGORY-1
16	BUS DUCT-SANDWICH	RISHA / ADVANCE / RR KABEL / LAURITZ KNUDSEN / C&S / LEGRAND (NOVATEUR) / EAE / SCHNEIDER	CATEGORY-2
17	H.T /L.T.TERMINATION & JOINTING KIT.	DENSONS / CABSEAL® (HARI CONSOLIDATED) / COMPAQ / RAYCHEM	CATEGORY-3
18	POWER CABLES ABOVE 1.1 KV	V-MARC / SBEE / SUYOG ELECTRICALS LTD / DICABS / APAR / GEMSCAB / HPL / RR KABEL / SPECIAL CABLES / JMW KABEL / PARAMOUNT / TIRUPATI / KEC / POLYCAB / DYNAMIC / HAVELLS / KEI / UNISTAR / GLOSTER / RAVIN CABLES / NICCO	CATEGORY-1
19	POWER CABLES UP TO AND INCLUDING 1.1 KV	ALLCAB / AURAFLEX / V-MARC / VISHAL / SBEE / POLYCORE / VIN POWER / TORTEK / SUYOG ELECTRICALS LTD / GEMSCAB / RR KABEL / PLAZA / SPECIAL CABLES / KEI / JMW KABEL / POLYCAB / AVOCAB (CHANDRESH) / DYNAMIC / PARAMOUNT / SVARN / RALLISON (LKB) / BCH / TIRUPATI / KEC / GRANDLAY / HPL / GLOSTER / BONTON / HAVELLS / UNISTAR / APAR / RAVIN CABLES / NICCO	CATEGORY-1
20	CONTROL CABLES	GEMSCAB / ALLCAB / AURAFLEX / V-MARC / SBEE / POLYCORE / TORTEK / NICCO / SUYOG ELECTRICALS LTD / RR KABEL / PLAZA / SPECIAL CABLES / JMW KABEL / AVOCAB (CHANDRESH) / PARAMOUNT / SVARN / RALLISON (LKB) / BCH / BONTON / TIRUPATI / KEI / KEC / GRANDLAY/ UNISTAR / NATCAB (KWALITY) / HPL / POLYCAB / DYNAMIC / ALOKE (ANKUR) / HAVELLS / GLOSTER / FINECAB / APAR / BATRA HENLAY/ RAVIN CABLES	CATEGORY-1
21	TELEPHONE CABLE	POLY INFOCOM CABLES PVT LTD / ORBIT / DUCAB / RR KABEL / PLAZA / JMW KABEL / PARAMOUNT / ALOKE (ANKUR) / RALLISON (LKB) / BONTON / TIRUPAT / HAVELLS / KEI / KEC / KVVS (INDUSTIRAL) / HPL / POLYCAB / NICCO	CATEGORY-2
22	CO- AXIAL/ INSTRUMENTATION/ FIBRE OPTIC/ CAT-6 / CAT-6A CABLES	AURAFLEX / SBEE / TORTEK / SUYOG ELECTRICALS LTD / ORBIT / POLYCORE / POLY INFOCOM CABLES PVT LTD / BATRA HENLAY / GEMSCAB / RR KABEL / PLAZA / SPECIAL CABLES / JMW KABEL / POLYCAB / PARAMOUNT / LEGRAND(NOVATEUR) / SVARN / RALLISON (LKB) / BONTON / HAVELLS / KEI / ROSENBERGER / KEC / GRANDLAY / GLOSTER / SCHNEIDER / APAR	CATEGORY-2
23	GI / SS CABLE MANAGEMENT SYSTEM (CABLE TRAY-PRE-FABRICATED/ PERFORATED / LADDER TYPE / WIRE MESH TYPE, ETC.)	GLOBAL / OBO BETTERMANN / MM ENTERPRISES / GLOBE / BEC / RMCON (RMG) / EXCEL CONTROL SYSTEMS / ADVANCE- ANANT / RMSCO (RAJASTHAN METAL) / SUMIP / CTM / L.S POWER / LEGRAND (NOVATEUR) / INDIANA / MM ENGG / SLOTCO / MEM	CATEGORY-3
24	UNDER FLOOR RACEWAYS & ITS ACCESSORIES	OBO BETTERMANN / BEC / ADVANCE- ANANT / SPC ELECTROTECH / CTM / MM ENTERPRISES	CATEGORY-3
25	CAPACITORS	SELEC / NEPTUNE / LAURITZ KNUDSEN / P2 POWER / LEGRAND (NOVATEUR) / HAVELLS / TDK INDIA / SCHNEIDER	CATEGORY-2

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
26	APFC PANEL/ ACTIVE & PASSIVE (HYBRID) PANEL	MAK / APPLICATION CONTROL PANEL / SHIV SHAKTI ENGINEERS / TENCO / RISHA / INPHASE POWER TECHNOLOGIES PVT LTD / GLOBAL / R.P. CONTROLS / ULTIMA / SUPERTECH CONTROL SYSTEMS / SWITCHGEARS & FABRICATORS (SGF) / POWERTECH SWITCHGEARS / HAROLD / AB POWER / URJAYANT / SELEC / EAP / CG POWER / P2 POWER / KEPL (KHOKHAR) / ITE-GURGON (INDIAN TRANSFORMERS) / CONQUERENT / BCH / ANANT POWER (ADVANCE) / RISHA / HAVELLS / CORONET / SPC ELECTROTECH / PEATON / L.S POWER / MILESTONE / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / C&S / NEPTUNE / SCHNEIDER / NEPTUNE / P2 POWER / SELEC / ANANT POWER (ADVANCE) / SCHNEIDER / SPC ELECTROTECH / ADLEC / RST ELECTRICALS PVT LTD / TDK INDIA / TRICOLITE / AMBIT	CATEGORY-1
27	LIGHTENING PROTECTION SYSTEM (LPS) COMPLYING UPDATED IEC / NBC	JEF / OBO BETTERMANN / GROUND ECA3G / NEXPO POWER SOLUTIONS / CAPE / JMV / ABB / DEHN / PHEONIX / TERCEL	CATEGORY-3
28	EARTHING SYSTEM (CHEMICAL)	JEF / OBO BETTERMANN / GROUND ECA3G / TERCEL / BEC / DEHN / ABB / JMV / NEXPO POWER SOLUTIONS / RMSCO (RAJASTHAN METAL) / CAPE / JK CHEMRODE / PROTEC-DHRUVA (DHRUVA) / APS	CATEGORY-3
29	SURGE PROTECTION DEVICES	OBO BETTERMANN / DSS / GROUND ECA3G / TERCEL / WAGO / HAVELLS / ABB / CAPE / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / DEHN / MERSEN / JMV / PHOENIX CONTACT / PROTEC ALLIED / SECOM / CITEL	CATEGORY-3
30	SCADA (HARDWARE & SOFTWARE, EXCEPT COMPUTER & ACCESSORIES)	LAURITZ KNUDSEN / WAGO / PHOENIX CONTACT / HONEYWELL / SCHNEIDER / SIEMENS	CATEGORY-2
31	SF6 CIRCUIT BREAKER/ VACUUM CIRCUIT BREAKER	EATON / VOLTAMP / LAURITZ KNUDSEN / PASCAL / EATON / CG POWER / ABB / SCHNEIDER / SIEMENS	CATEGORY-2
32	SERVO / AUTOMATIC VOLTAGE STABLIZER	POWERWARE / KRYKARD / FUJI ELECTRIC / PVJ POWER / SELEC / ITE-GURGON (INDIAN TRANSFORMERS) / P2 POWER	CATEGORY-2
33	AUTO TRANSFER SWITCH (ATS)	EATON / HPL / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / SOCOMEC / HAVELLS / ASCO (SCHNEIDER)	CATEGORY-2
34	COMPACT SUB STATION	PVJ POWER / CORONET / ITE-GURGON (INDIAN TRANSFORMERS) / CONQUERENT / SUDHIR POWER / PEATON / L.S POWER / VOLTAMP / LAURITZ KNUDSEN / ABB / SCHNEIDER	CATEGORY-1
35	EMERGENCY LIGHT - LED (PORTABLE)	LIFE-GUARD / PROLITE	CATEGORY-3
36	CABLES GLANDS	HENSEL / POLYCAB / TRINITY TOUCH / ROXTEC / BRACO / MCI / (METAL/ CRAFT)	CATEGORY-3
37	LUGS & THIMBLES	WAGO / POLYCAB / TRINITY TOUCH	CATEGORY-4
38	SYNTHETIC / PVC INSULATING MATS	CPRI certified for required voltage level	CATEGORY-2
39	INSULATION TAPE (HT / LT)	MODI's / BENLO / ANCHOR	CATEGORY-4
C	**DG SETS & RELATED ITEMS**		
40	DIESEL ENGINE ABOVE 250 KVA	GREAVES COTTON / BAUDOUIN (SHANDONG) / MAHINDRA POWEROL CUMMINS / KOEL / CATERPILLAR	CATEGORY-1
41	DIESEL ENGINE UPTO AND INCLUDING 250 KVA	GREAVES COTTON / BAUDOUIN (SHANDONG) / TMTL (TAFE MOTERS) / CUMMINS / MAHINDRA POWEROL / ASHOK LEYLAND / KOEL / CATERPILLAR	CATEGORY-1

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
42	ALTERNATOR	TDPS (TD POWER SYSTEM) / KIRLOSKAR / CATERPILLAR / GREAVES COTTON	CATEGORY-1
43	BATTERIES-LED ACID/Li-ION	CLN / EXIDE / AMARON	CATEGORY-3
44	BATTERY CHARGER	SELEC / VERTIV / DELTA	CATEGORY-2
45	UPS - ABOVE 10 KVA	DELTA / ORION / FUJI ELECTRIC / KRYKARD / 3EM / PROSTARM / UNILINE/ TMEIC / POWER ONE / RIELLO / ABB / SOCOMEC / EATON / SCHNEIDER / NUMERIC-LEGRAND/ VERTIV (EMERSON)	CATEGORY-3
46	UPS - UPTO 10 KVA	DELTA / ORION / FUJI ELECTRIC / KRYKARD / PROSTARM / RIELLO / UNILINE / ABB / POWER-ONE / DELTA / SOCOMEC / EATON / SCHNEIDER / NUMERIC-LEGRAND / VERTIV (EMERSON)	CATEGORY-3
D	**INTERNAL WIRING RELATED TEAMS**		
47	MCB / ISOLATOR / MCBDB / RCCB / RCBO / ELCB	ANCHOR (PANASONIC) / ORIENT ELECTRIC / LAURITZ KNUDSEN / MITSUBHISHI / LEGRAND (NOVATEUR) / C&S / HPL / ABB / POLYCAB / HAVELLS / SCHNEIDER / INDO ASIAN (NOVATEUR) / GM / MK HONEYWELL / BCH / EATON	CATEGORY-2
48	MS CONDUIT (ISI MARKED)	VPL / BEC / AKG / STEEL KRAFTS / TRINITY TOUCH / RMCON (RMG STEELS) / SUPER / JPC PIPES	CATEGORY-3
49	PVC CONDUIT (ISI MARKED)	VPL / FUSION / ASTRAL / SKYDA / BEC / NORPACK / MODI's / ANCHOR (PANASONIC) / POLYCAB / TRINITY TOUCH / AKG / GM / JPC PIPES	CATEGORY-3
50	INDUSTRIAL SOCKET IN SHEET STEEL ENCLOSURE WITH MCB/SWITCH	AJMERA ELECTROTECH LLP / LAURITZ KNUDSEN / POLYCAB / NEPTUNE-BALS / LEGRAND (NOVATEUR) / C&S / BCH / HAVELLS / HPL / SCHNEIDER	CATEGORY-4
51	INSULATED COPPER WIRE	RAJNIGANDHA / GEMSCAB / ALLCAB / AURAFLEX / V-MARC / SBEE / UNISTAR / POLYCORE / TORTEK / BATRA HENLAY / RR KABEL / AKG / ANCHOR (PANASONIC) / BENTEC / JMW KABEL / POLYCAB / AVOCAB (CHANDRESH) / SVARN / PARAMOUNT / RALLISON (LKB) / HAVELLS / NATCAB (KWALITY) / BONTON / GRANDLAY / GLOSTER / BCH / APAR / GM / PARAGON (ELEKTRON) / FINECAB / ZENIUM	CATEGORY-2
52	SWITCHES/ SOCKETS/ TELEPHONE/ TV/ DATA SOCKET/ BOXES (MODULAR TYPE)	RR KABEL / ANCHOR (PANASONIC) / ORIENT ELECTRIC / INDO ASIAN (NOVATEUR) / C&S / POLYCAB / HPL / LAURITZ KNUDSEN / LEGRAND (NOVATEUR) / HAVELLS / GM / MK HONEYWELL / WESTERN VEGA / ABB	CATEGORY-3
53	SWITCHES/ SOCKETS/ TELEPHONE/ TV/ DATA SOCKET/ BOXES (PIANO TYPE)	ANCHOR (PANASONIC) / BENTEC / HAVELLS / HPL / POLYCAB / MK HONEYWELL / WESTERN VEGA	CATEGORY-3
E	**FIRE ALARM EQUIPMENTS**		
54	FIRE / SMOKE DETECTOR/ MULTI CRITERIA DETECTOR/ FIRE ALARM PANEL / REPEATER PANEL/ HOOTER / MANUAL CALL POINT / RESPONSE INDICATOR/ FAULT ISOLATOR	NOTOFIRE / VELOX / SCHNEIDER / PANASONIC / EATON / HOCHIKI / RAVEL / SIEMENS / BOSCH / APOLLO / EDWARDS (UTC) / G + M / SCHRACK / HONEYWELL / KIDDE (UTC) / GST (UTC) / TYCO / ASES	CATEGORY-2

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
55	FIRE SURVIVAL CABLE	GEMSCAB / SBEE / FRTEK / BATRA HENLAY / RR KABEL / SEPCIAL CABLES / SVARN / JMW KABEL / POLYCAB / ALOKE (ANKUR) / RALLISON (LKB) / KEC / GRANDLAY / RAVEL / GLOSTER / KEI / BONTON / BOSCH / WREXHAM / FUSION POLYMER	CATEGORY-2
56	FIRE SIGNAGES	ASES / LIFEGUARD (UNITED FIRE) / EATON / FIRE SHIELD / BOSCH / RAVEL / DELITE / AUTOGLO (PROLITE)	CATEGORY-3
57	ASPIRATION SYSTEM	SHOOTFIRE (VIMAL FIRE) / HOCHIKI / BOSCH / RAVEL	CATEGORY-2
F	LED LIGHT FIXTURE AND FANS		
58	LIGHT FIXTURE WITH LED - INDOOR	PYROTECH / GOLDWYN LED / KI KALINGIA / GM / NESSA / PLUS LIGHT TECH / LEGERO / MAGIK / LIGHTBOOK / LEKSA LIGHTING / R R KABEL (RR/ AARAYSTORM) / PANASONIC / EVEREADY / INSTAPOWER / POLYCAB / SURYA / HALONIX / HAVELLS / SIGNIFY / JAQUAR (JAQUAR LIGHTING) / HPL / BAJAJ / WIPRO / ORIENT / CROMPTON / REGENT	CATEGORY-2
59	LIGHT FIXTURE WITH LED – OUTDOOR/FACADE	PYROTECH / GOLDWYN LED / KI KALINGIA / GM / NESSA / PLUS LIGHT TECH / MAGIK / LIGHTBOOK / LEKSA LIGHTING / R R KABEL (RR/ AARAYSTORM) / PANASONIC / HPL / BENTEC (BENLO) / EVEREADY/ POLYCAB / K-LITE / SURYA / TRANSRAIL / HALONIX / HAVELLS / JAQUAR (JAQUAR LIGHTING) / SIGNIFY / INSTAPOWER / BAJAJ / WIPRO / ORIENT / CROMPTON / REGENT	CATEGORY-2
60	LINEAR LED/ CUSTOMISED/ DECORATIVE LED LIGHT FIXTURE	PYROTECH / GOLDWYN LED / KI KALINGIA / GM / LIGHT FORMS / PLUS LIGHT TECH / LEGERO / MAGIK / WMEL / FORUS / HUBLIT / LIGHTBOOK / PANASONIC / POLYCAB / R R KABEL (RR/ AARAYSTORM) / EVEREADY / SURYA / HALONIX / HAVELLS / HPL / SIGNIFY / BAJAJ / WIPRO / ORIENT / CROMPTON / REGENT	CATEGORY-2
61	AVIATION WARNING /OBSTRUCTION LIGHT	PYROTECH / FORUS / KI KALINGIA / HARYANA GENERAL INDUSTRIES / VSTP / K-LITE / SURYA / TRANSRAIL / HPL / INSTAPOWER / BAJAJ / WIPRO / CROMPTON /	CATEGORY-3
62	CEILING/ WALL / EXHAUST / PEDESTAL FAN (CONVENTIONAL / BLDC)	ORIENT ELECTRIC / RR KABEL / ANCHOR (PANASONIC) / POLYCAB / HALONIX / HAVELLS / ALMONARD / USHA / KHAITAN	CATEGORY-3
63	HVLS FANS	MARUT AIR / RR KABEL / RITE HITE	CATEGORY-3
G	AIRCONDITIONING AND FIRE FIGHTING ACCESSORIES		
64	G I / M S PIPE (ISI MARKED)	VPL / ITL / BEC / APL APOLLO / PRAKASH SURYA / JINDAL STAR / TATA / SAIL / HIRA PIPES (RR ISPAT) /	CATEGORY-2
65	MANUAL VALVE - BUTTERFLY/ SLUICE / CHECK / NRV / FOOT/GATE / GLOBE	LEHRY / SANT / VENUS / NEWAGE FIRE / CASTLE / ZOLOTO / VTM (VA VALVES) / EMERALD / ADVANCE VALVES / DIVINE / C&R	CATEGORY-2
66	MOTORISED VALVE - BALANCING / MODULATING / PICB / DELTA T / CONTROL / MIXING	SANT / VTM (VA VALVES) / CASTLE / DANFOSS / ZOLOTO / ANERGY	CATEGORY-2
67	SUCTION / POT / Y-STRAINER	VENUS / CASTLE / ZOLOTO / ANERGY / SANT / VTM (VA VALVES) / EMERALD	CATEGORY-2
68	FLEXIBLE CONNECTION FOR SPRINKLER / SPRINKLER	LIFEGUARD (UNITED FIRE) / FIRE SHIELD / NEWAGE / EXFLAME / HD / SAFEFIRE	CATEGORY-2
69	FIRE HYDRANT LANDING VALVES/ INSTALLATION VALVE/ FIRE BRIGADE CONNECTION.	SHOOTFIRE (VIMAL) / LIFEGUARD (UNITED FIRE) / ZOLOTO / KALPEX (KALPATARU) / NEWAGE / EXFLAME / SAFEFIRE / HD / FIRE SHIELD	CATEGORY-2

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
70	FIRE HOSE PIPES/ FIRST AID HOSE REEL/ BRANCH PIPE / NOZZLE / COUPLINGS	SHOOTFIRE (VIMAL) / LIFEGUARD (UNITED FIRE) / KALPEX (KALPATARU) / NEWAGE / FIRE SHIELD / EXFLAME / SAFEFIRE	CATEGORY-2
71	FIRE EXTINGUISHERS	DSS / KANEX / SHOOTFIRE (VIMAL) / LIFEGUARD (UNITED FIRE) / CEASEFIRE / SAFEFIRE / AFS (ADVANCED) / KALPEX (KALPATARU) / EXFLAME / SUPREMEX / FIRE SHIELD / MINIMAX / SAFEX	CATEGORY-2
72	GAS BASED FIRE SUPPRESSION SYSTEM	SYNERGY & SYNERGY PLUS / FIRECEASE / FIRETREX / VIVINA / ASES / CEASEFIRE / SHOOTFIRE (VIMAL) / LIFEGUARD (UNITED FIRE) / KALPEX(KALPATARU) / FOAMTECH / SUPREMEX / SIEMENS / FIRETREX (SVS)	CATEGORY-2
73	KITCHENHOOD GAS BASED SUPPRESSION SYSTEM	SYNERGY / FIRECEASE / FIRETREX / VIVINA / SHOOTFIRE (VIMAL) / UNITED / FOAMTECH / CEASEFIRE / KALPATARU /	CATEGORY-2
74	HIGH/LOW PRESSURE WATER MIST BASED FIRE SUPRESSION SYSTEM	SYNEAQUAMIST / FIRETREX / SHOOTFIRE	CATEGORY-2
75	FLOW SWITCH/PRESSURE SWITCH	OMICRON / ANERGY / DANFOSS / EMERALD / SWIZER	CATEGORY-3
76	FIREMAN AXE	LIFEGUARD (UNITED FIRE) / NEWAGE / FIRE SHIELD / ADVANCE	CATEGORY-3
77	DIESEL ENGINE DRIVEN PUMP FOR FIRE FIGHTING	TMTL (TAFE MOTERS) / KSB / WILO / GRUNDFOS / KIRLOSKAR / ASHOK LEYLAND / CATERPILLAR / MAHINDRA POWEROL	CATEGORY-2
78	PUMPS -VERTICAL/ HORIZONTAL / SUBMERSIBLE	HAVELLS / WILO / GRUNDFOS / ANDRITZ / KSB / KIRLOSKAR / XYLEM / AQUA_ANS / MATHER & PLATT / CROMPTON	CATEGORY-2
79	MOTORS	LHP / ROTOMOTIVE / KSB / HAVELLS / TMEIC / GRUNDFOS / BCH / KIRLOSKAR / BHARAT BIJLEE / ALSTOM / SEIMENS / CROMPTON	CATEGORY-2
80	MOTOR STARTER	BENTEC / KSB / HAVELLS / L.S POWER / GRUNDFOS / PHOENIX / C&S / BCH / SCHNEIDER / EATON / MOTOVARIO / SIEMENS / SCHNEIDER	CATEGORY-2
81	SINGLE PHASE PREVENTER / OVER LOAD PROTECTION/HIGH VOLTAGE/LOW VOLTAGE/EARTH FAULT PROTECTION	C&S / LAURITZ KNUDSEN / SELEC / SIEMENS	CATEGORY-3
82	G I SHEETS	JSW STEEL / TATA / HSL / SAIL	CATEGORY-2
83	GRILLS /DIFFUSERS	PRECISE / ASAWA INSULATION / MAPRO (AIR FLOW) / CRYSTAL / TRISTAR	CATEGORY-3
84	INSULATION MATERIAL - ROCK WOOL/ GLASS WOOL	ENSAVE / ROCK INSUL / AEROLAM / SUNROCK (THERMOCARE ROCK WOOL) / INSUFLEX (THE SUPREME) / LIONROCK / POLYBOND / EPACK / TWIGA INSUL	CATEGORY-3
85	INSULATION MATERIAL - XLPE/EPDM/ NITRILE RUBBER	AEROFOAM / PARAMOUNT / SAFARI / AEROLAM / INSUFLEX (THE SUPREME) / EPACK / SUNROCK (THERMOCARE ROCK WOOL) / INSUFLEX (THE SUPREME) / LIONROCK / POLYBOND / TWIGA INSUL	CATEGORY-3

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
86	PRE-INSULATED DUCT	ASAWA INSULATION / MECHEASY	CATEGORY-3
87	PRE-FABRICATED GI DUCT	ASAWA INSULATION / WAD / DUCTOFAB / WAVES / ZECO / ADVANCE VENTILATION	CATEGORY-3
88	FIRE DAMPERS	MAPRO (AIR FLOW) / GREENHECK / TRISTAR / RUSKIN / CARRIER	CATEGORY-2
89	AIR CURTAINS	EURONICS / MITZVAH / TECHNOCRATS / DOLPHY	CATEGORY-2
90	MODULATING MOTOR/FIRE DAMPER MOTOR	LHP / ANERGY / HONEYWELL / GRUNDFOS / BALEMO / SIEMENS	CATEGORY-2
91	AIR FILTERS (MERV/ESP/HEPA) FOR HVAC SYSTEM	MECHMAARK / ADITYA / O2 CURE / WAVES / HUMIDIN / INTELLIGREEN	CATEGORY-3
92	THERMOSTATS / HUMIDISTATS	OMICRON / ANERGY / FINDER / DANFOSS / HONEYWELL	CATEGORY-3
93	THERMOMETERS/ PRESSURE GAUGE	OMICRON / ANERGY / EMERALD / FIEBIG	CATEGORY-3
94	INTEGRATED BUILDING MANAGEMENT SYSTEM /(IBMS)/BMS/ SCADA SYSTEM (HARDWARE* & SOFTWARE, EXCEPT COMPUTER & ACCESSORIES)	SCHNEIDER / ENLITE / PANASONIC / WAGO / PHOENIX / SIEMENS / AZBIL / LAURITZ KNUDSEN / TRIDIYM (* includes all hardware of BMS)	CATEGORY-3
95	FIELD DEVICES (FOR IBMS/BMS/SCADA)	SELEC / OMICRON	CATEGORY-3
96	VFD DRIVE	YASKAWA / SELEC / FUJI / TMEIC / LAURITZ KNUDSEN / DANFOSS / SCHNEIDER / SIEMENS	CATEGORY-3
H	**AC PLANTS, AC UNITS & EQUIPMENTS**		
97	AIR-CONDITIONER UNITS - SPLIT / WINDOW / CASSETTE/ TOWER	HAVELLS / HITACHI (JOHNSON) / LG / BLUE STAR / DAIKIN/ VOLTAS / SAMSUNG / HAIER / O GENERAL / PANASONIC / CARRIER	CATEGORY-2
98	PRECISION AIR CONDITIONING (PAC)	CLIMAVENTA / SWEGON BLUE BOX / SIDWAL	CATEGORY-3
99	PACKAGED AIRCONDITIONER	DAIKIN / HITACHI (JOHNSON) / VOLTAS / LG / SIDWAL / CARRIER / DAIKIN / BLUE STAR	CATEGORY-2
100	CHILLERS	KIRLOSKAR / DAIKIN / CARRIER / VOLTAS / BLUE STAR / LG / CLIMAVENETA / TRANE / YORK / SWEGON BLUE BOX / DUNHAMBUSH	CATEGORY-1
101	AIR HANDLING UNITS (AHU)	CRYSTAL / CITIZEN / WAVES / EDGETECH / CARRIER / ZECO / HUMIDIN / TRISTAR	CATEGORY-1
102	FAN COIL UNIT (FCU)	WAVES / CRYSTAL / ZECO / CITIZEN / EDGETECH / CARRIER / DAIKIN / TRISTAR / YORK	CATEGORY-2
103	VRV/ VRF HVAC UNIT	LG / HITACHI (JOHNSON) / SAMSUNG / DAIKIN / VOLTAS / HAIER / CARRIER / BLUE STAR	CATEGORY-2

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
104	COOLING TOWER UP TO 200 TR.	DELTA / BELL COOLING TOWERS / MIHIR / PAHARPUR	CATEGORY-2
105	COOLING TOWER ABOVE 200 TR.	DELTA / BELL COOLING TOWERS / MIHIR / PAHARPUR	CATEGORY-2
106	EXPANSION TANK	ANERGY	CATEGORY-3
107	AIR & DIRT SEPARATOR	ANERGY	CATEGORY-3
108	FAN - AXIAL FLOW / INLINE / VENTILATION / PROPELLER / PLUG	DYNAIR-MAICO / DUSTECH / KRUGER / WAVES / HUMIDIN / WOLTER / AIR FLOW / RR KABEL / CRYSTAL / GREENHECK	CATEGORY-2
109	R O SYSTEM /WATER SOFTENING PLANT	SURYA RO / DELTA / WAE / VENZA (MGROW)	CATEGORY-3
110	WATER COOLER	CLIMATROL / VOLTAS / ORIENT ELECTRIC / SIDWAL	CATEGORY-3
111	WATER DISPENSER	WAE / VENZA (MGROW) / VOLTAS	CATEGORY-3
112	DRINKING WATER FOUNTAIN	WAE / VENZA (MGROW) / OASIS	CATEGORY-3
I	**PA SYSTEM & RELATED ITEMS**		
113	AMPLIFIERS	ATEIS / SCHRACK / HEINRICH / BOSCH / HONEYWELL / OPTIMUS / BOSE	CATEGORY-2
114	ANNOUNCEMENT MICROPHONES /CAR CALL CONSOLES	ATEIS / SCHRACK / HEINRICH / BOSCH / HONEYWELL / OPTIMUS / BOSE	CATEGORY-2
115	CONTROLLERS	ATEIS / SCHRACK / BOSCH / HEINRICH / HONEYWELL / OPTIMUS	CATEGORY-3
116	SPEAKER	ATEIS / SCHRACK / HEINRICH / BOSCH / NOTIFIRE / OPTIMUS / BOSE	CATEGORY-3
117	DIGITAL CALL STATION / WORK STATION	AVTRON / ATEIS / HEINRICH / BOSCH / OPTIMUS	CATEGORY-3
118	EQUIPMENT RACK	HEINRICH / BOSCH / PRESIDENT / ORDEIN	CATEGORY-3
119	DVD/DVR /MP3 PLAYER	TYCO / HEINRICH / BOSCH / HONEYWELL / SIEMENS / OPTIMUS	CATEGORY-2
120	CABLE FOR MICROPHONE / SPEAKER	RR KABEL / JMW KABEL / POLYCAB / BONTON / BOSCH / HPL / KVVS (INDUSTRIAL)	CATEGORY-2
121	DIGITAL LINE ARRAY SPEAKER	ATEIS / HEINRICH / BOSCH / BOSE / OPTIMUS	CATEGORY-2
122	CCTV CAMERA	AVTRON / TYCO ILLUSTRA / HEINRICH / SIEMENS / BOSCH / HONEYWELL / ULTRAK / PELCO	CATEGORY-2
123	MONITOR /DISPLAY-LCD / LED / PLASMA	LG / PANASONIC / SAMSUNG / SONY	CATEGORY-2
124	COMPUTER /LAPTOP (FOR IBMS/BMS/SCADA)	HP / DELL / LENOVO / IBM	CATEGORY-4
125	COMPUTER ACCESSORIES (KEY BOARD/MOUSE)	HP / DELL / LENOVO / IBM	CATEGORY-4

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
J	SOLAR PLANT & ACCESSORIES		
126	SOLAR INVERTER/ POWER CONDITIONING UNIT	SELEC / HAVELLS/ POWER ONE	CATEGORY-2
127	SOLAR MODULES	SWELECT / HAVELLS/ JAKSON	CATEGORY-2
128	DC CABLES	GEMSCAB / APAR / RR KABEL / SPECIAL CABLES / JMW KABEL / POLYCAB / HAVELLS / RALLISON (LKB) / KEC / HPL / GLOSTER / KEI / BONTON	CATEGORY-2
K	MISCELLANEOUS & OTHER MECHANICAL ITEMS		
129	HAND DRIER	TECHNOCRATS / EURONICS / DOLPHY / ANAND AUTOMATIC SYSTEM	CATEGORY-3
130	DOUBLE WALL CORRUGATED HDPE PIPE/PLAIN HDPE PIPE	VPL / GANGOTRI / ASTRAL / CPE / BEC PLAST / KESHAV KRIPA / VALENS / TIRUPATI PLASTOMATIC / GEMINI / HIMALYAN / MANGALAM	CATEGORY-3
131	AUTOMATIC SLIDING DOOR	HOUSYS / GEZE / NEPTUNE / S. ADITYA / DORMAKABA / TECHNOCRATS / AUTOINGRESS	CATEGORY-3
132	ELEVATOR	ORBIS / SCHINDLER / FUJITEC / INFRA / TRIO ELEVATOR / OMEGA ELEVATOR / ESCON / JOHNSON LIFTS / ECE / KONE / TKE / OTIS	CATEGORY-1
133	ESCALATOR /TRAVELATOR	ORBIS / SCHINDLER / TRIO ELEVATOR / OMEGA ELEVATOR / JOHNSON LIFTS / KONE / TKE / OTIS	CATEGORY-1
134	BOLLARD	HOUSYS / AVIANS / SWARAJ / S. ADITYA / TECHNOCRATS / EURONICS / NEPTUNE / BROSIS / FAAC	CATEGORY-3
135	BOOM BARRIER	HOUSYS / AVIANS / SWARAJ / S. ADITYA / DORMAKABA / TECHNOCRATS / BROSIS / NEPTUNE / AUTOINGRESS / FAAC / SPEEDGATZ	CATEGORY-3
136	TROLLEY GATE	AVIANS / SWARAJ / S. ADITYA / TECHNOCRATS / DELITE / AUTOINGRESS / LOTUS	CATEGORY-3
137	TYRE KILLER/SPIKE BARRIER	HOUSYS / SWARAJ / S. ADITYA / TECHNOCRATS / NEPTUNE / BROSIS / FAAC / SPEEDGATZ	CATEGORY-3
138	UNDER VEHICLE SCANNING SYSTEM	HOUSYS	CATEGORY-3
139	EXTERNAL LIGHTING POLES/ DECORATIVE LIGHT POLE	SUBHAM / AMBIKA POLES / LYSAGHTPOLE^{TM} / VAKRANGEE / VSTP / UTKARSH / RMSCO (RAJASTHAN METAL) / SKIPPER / BP PROJECTS / K-LITE / TRANSRAIL / PRAKASH SURYA (SURYA ROSHNI) / SUMIP / SIGNIFY / BAJAJ / WIPRO / CROMPTON / ORIENT ELECTRIC	CATEGORY-3
140	HIGH MAST	SUBHAM / AMBIKA POLES / VAKRANGEE / VSTP / LYSAGHTPOLE^{TM} / UTKARSH / SKIPPER/ BP PROJECTS / K-LITE / PRAKASH SURYA (SURYA ROSHNI) / TRANSRAIL / SIGNIFY / BAJAJ / WIPRO / ORIENT ELECTRIC / CROMPTON	CATEGORY-3
141	ALUMINIUM LADDERS / HYDRAULIC LADDERS	DELITE	CATEGORY-2
142	BOOM /SCISSOR/SPIDER/VERTICAL LIFT	MLIFT	CATEGORY-2
143	DASH FASTENERS	HILTI / FISCHER	CATEGORY-4
144	GEAR BOX	MGM VARVEL / iMAK	CATEGORY-3
145	GEARED MOTOR	LHP / LENZE / ROTOMOTIVE / MGM VARVEL / iMAK	CATEGORY-3
146	WEATHERPROOF JUNCTIONBOX	TRINITY TOUCH / SPELSBERG (CAPE) / RITTAL	CATEGORY-3

ITEM CODE	ITEMS	PREFERRED MAKES (W.E.F. 10.07.2025)	CATEGORY FOR TEST CERTIFICATION/ INSPECTION
147	EV CHARGERS	P2 POWER / E-FUEL / AXONIFY TECH SYSTEMS PRIVATE LIMITED	CATEGORY-1
L	GROUND LIGHTING ITEMS		
148	PAPI (NON-LED)	AMA / VARDHMAN / NASU SYSTEM	CATEGORY-1
149	LAMP (HALOGEN)	YOUYANG	CATEGORY-3
150	AGL FITTING (LED)	VARDHMAN / AMA	CATEGORY-1
151	AGL FITTING (NON-LED)	VARDHMAN / AMA	CATEGORY-1
152	ALCMS / ILCMS	VARDHMAN	CATEGORY-1
153	ISOLATING TRANSFORMER	TRIO / CTC (CREATIVE TRADING) / VARDHMAN / AMA / BILDAL / ELECTROMACH / YOUYANG	CATEGORY-1
154	CONSTANT CURRENT REGULATOR (CCR)	VARDHMAN / AMA / HONEYWELL / YOUYANG / NASU SYSTEM	CATEGORY-1
155	5 KV GRADE AFL CABLE - UNSHIELDED / SHIELDED	GEMSCAB / APAR / RR KABEL / ALOKE (ANKUR) / RALLISON (LKB) / JRD / KEI / GLOSTER	CATEGORY-1
156	1.1 KV GRADE SECONDARY LEAD FOR AFL CABLE	GEMSCAB / APAR / RR KABEL / AMA / ELECTROMACH / ALOKE (ANKUR) / RALLISON (LKB) / JRD	CATEGORY-2
157	PLUGS / RECEPTACLE / CONNECTOR	CTC (CREATIVE TRADING) / ELECTROMACH / ALOKE (ANKUR) / VARDHMAN / NEPTUNE / AMA / BILDAL / YOUYANG	CATEGORY-2

Note: This is mere enlistement as preferred make and is subject to the compliance of Technical Specification mentioned in tender.

CATEGORY REQUIREMENT OF TEST CERTIFICATE/ INSPECTION

CATEGORY-1:

a) Type test certificate for similar item done. If not one of the items offered is to be type tested.
b) OEMs roytine test certificate.
c) Acceptance test to be conducted in the presence of AAI representative at OEMs factory.

CATEGORY-2:

a) Type test for similar done. If not, one of the items offered is to be type tested.
b) OEMs routine test certificate.
c) Visual and functional check by PMC / Engineering Consultant representative (AAI official incase of non avialibility of PMC/ Engineering Consultant) at AAI airport site.

CATEGORY-3:

a) OEM/ Dealer/ Contractor routine test certiicate.
b) Visual and functional check by PMC / Engineering Consultant representative (AAI official incase of non avialibility of PMC/ Engineering Consultant) at AAI airport site.

CATEGORY-4:

a) Visual and functional check by PMC / Engineering Consultant representative (AAI official incase of non avialibility of PMC/ Engineering Consultant) at AAI airport site.

Existing Provision

1. **Refer Sr. No.3 i.e. Special Approvals and Additions para 3 -**

   "For maintenance works with less than three enlisted makes, additional makes or brands may be considered, with the approval of the General Manager (Engg.) on a station-to-station basis".

2. **Annexure A1, Item code L-148 to 152 shall be read as below-**

Sr. No.	Items	PREFERRED MAKES (W.E.F. 10.07.2025)	Category For Test Certification/ Inspection
148	PAPI (NON-LED)	AMA / VARDHMAN / NASU SYSTEM	CATEGORY -1
149	LAMP (HALOGEN)	YOUYANG	CATEGORY -3
150	AGL FITTING (LED)	VARDHMAN / AMA	CATEGORY -1
151	AGL FITTING (NON-LED)	VARDHMAN / AMA	CATEGORY -1
152	ALCMS / ILCMS	VARDHMAN	CATEGORY -1

Amended Provision

1. **Refer Sr. No.3 i.e. Special Approvals and Additions para 3 -**

   "For maintenance/capital works, items with less than three enlisted makes, additional makes or brands may be considered, with the approval of the General Manager (Engg.) on a station-to-station basis" for RHQ schemes and of the concerned ED Engg. For CHQ schemes.

2. **Annexure A1, Item code L-148 to 152 shall be read as below-**

Sr. No.	Items	PREFERRED MAKES	Category For Test Certification/ Inspection
148	PAPI (NON-LED)	AMA / VARDHMAN FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	CATEGORY-1
149	LAMP (HALOGEN)	YOUYANG / PHILIPS / OSRAM / NARVA / AS RECOMMENDED BY OEM	CATEGORY-3
150(a)	AGL FITTING (LED)-ELEVATED	VARDHMAN / AMA FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT	CATEGORY-1

		OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	
150(b)	AGL FITTING (LED)-INSET	FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	CATEGORY-1
151(a)	AGL FITTING (NON-LED)-ELEVATED	VARDHMAN / AMA FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	CATEGORY-1
151(b)	AGL FITTING (NON-LED)-INSET	FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	CATEGORY-1
152	ALCMS / ILCMS	VARDHMAN FAA CERTIFIED / FAA COMPLIANCE (FOR INDEGENOUS MANUFACTURER) SUBJECT TO FULFILLING THE REQUIREMENT OF ICAO/DGCA-CAR AND APPROVAL AS PER SR NO.-3, PARA NO.-3 OF TC 03/2025	CATEGORY-1

SOQ

Name of Work : Development and Upgradation of Existing Airport at Valmiki Nagar for Code-2B type of Aircraft.
SH : Construction of Runway, Taxiway, Apron, Perimeter Road, GSE Area, Vehicular Lane, Emergency Access Road, RESA, Runway Basic Strip, and other associated works at Valmiki Nagar Airport. (Recall)

Sr. No.	Description of Item	Quantity	Unit
1	Earth work in excavation by mechanical means (Hydraulic excavator of 0.9 cum bucket capacity) in all kinds of soil including all types of rocks excluding hard rock over areas including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, transporting and unloading to the embankment/filling location within all lifts and lead upto 1000m. (Note: The quoted rate of the item shall be all inclusive irrespective of position of ground water table or natural moisture content of soil) (As per MoRTH specifications)	56386.00	Cum
2	Construction of embankment with available excavated earth deposited at site from other locations with spreading, neatly leveling/ grading to required slope and compacting layer by layer to achieve the desired levels and compactions to meet the requirement of table 300-2 of MORTH specification etc. complete in all respects as per direction of Engineer-in-Charge.	53728.00	Cum
3	Providing and laying graded granular material (moorum) in layers not exceeding 20cm (loose) in thickness (each layer) and as directed by the Engineer-in charge. Breaking clods, watering, consolidating each layers with power road roller 8-10 tonne, under optimum moisture content to give density not less than that specified of the maximum modified standard proctor density at OMC including levelling, fine dressing to the required camber, grade and slope etc complete. Material of soaked CBR greater than 8% (payment to be made for the compacted quantity only). (As per MoRTH specifications)	16800.00	Cum
4	Preparation of granular sub-base by providing close graded material, conforming to specifications mixing in a mechanical mix plant at OMC, carriage of mixed material by mechanical transport to work site, for all leads and lifts, spreading in uniform layers of specified thickness with mechanical means including neatly leveling & dressing on prepared surface and compacting with vibratory power roller to achieve the desired density, complete and as per direction of Engineer-in-charge. (As per MoRTH specifications)	8076.00	Cum
5	Providing, laying, spreading and compacting graded stone aggregate (size range 53 mm to 0.075 mm) to wet mix macadam (WMM) specification including premixing the material with water at OMC in mechanical mix plant, carriage of mixed material by tipper to site, for all leads & lifts, laying in uniform layers with mechanical paver finisher in sub- base / base course on well prepared surface and compacting with vibratory roller of 8 to 10 tonne capacity to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge. (As per MoRTH specifications)	8533.00	Cum
6	Providing and applying primer coat with bitumen emulsion SS1 grade conforming to IS:8887 on prepared surface of Granular Base including clearing of surface and spraying primer at the rate of 0.70 kg/sqm using mechanical means complete in all respects as per direction of Engineer-In-Charge. The contractor shall quote his rates assuming quantity of bitumen emulsion as 0.70 Kg/Sqm. If the actual quantity of bitumen emulsion varies from the quantity assumed above, necessary cost adjustment for deviation in the quantity of bitumen emulsion shall be done as per rate in actual supply voucher from nearest refinery at the time of execution. The rate of bitumen emulsion exclusive of GST shall only be considered for payment.	48760.00	Sqm
7	Providing and laying of Hot Mix Dense Bituminous Macadam (DBM) using crushed stone aggregate of quality, size and grading as specified and Hydrated lime as filler and Viscosity Grade Bitumen (supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade VG-30 shall be taken as 110 kg/m3 of mix supplied in bulk produced by Govt. Refineries and 2% Hydrated lime (factory made) Not less than 80% Purity by weight of aggregates as filler material]. The necessary cost adjustment shall be made based on JMF and availability of filler.	752.00	Cum
8	Providing and applying tack coat using bitumen emulsion (Rapid setting) complying with IS:8887, spraying the bitumen with mechanically operated spray unit at the rate specified below, cleaning and preparing the existing pavement surface as per specifications complete in all respects as per direction of Engineer-In-Charge. If the actual quantity of bitumen varies from the quantity specified, necessary cost adjustment for deviation in the quantity of bitumen shall be done as per rate in actual supply voucher from nearest refinery at the time of execution. The rate of bitumen exclusive of GST shall only be considered for payment. 0.20 Kg/Sqm on existing bituminous surface.	48760.00	Sqm
9	Providing and laying of Hot Mix Semi Dense Asphaltic Concrete (SDAC) using crushed stone aggregate of quality, size and grading as specified and Hydrated lime as filler and Viscosity Grade Bitumen(supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade VG-30 content shall be taken as 120 kg/m3 of mix supplied in bulk produced by Govt. Refineries and 2% Hydrated lime (factory made) Not less than 80% Purity by weight of aggregates as filler material]. The necessary cost adjustment shall be made based on JMF and availability of filler.	2438.00	Cum
10	Providing and laying of Hot Mix Dense Asphaltic Concrete (DAC) using crushed stone aggregate of quality, size and grading as specified and Hydrated lime as filler and Viscosity Grade Bitumen (supplied in bulk) in proportions as per job mix formula and laid to specified levels, grade and camber as per specification, drawings and as directed by the Engineer-in-Charge including compacting with 8-10 tonne, preferably vibratory road roller of adequate capacity to achieve the specified values of compaction, strength, surface accuracy complete [for tendering purpose VG bitumen of grade VG-30 content shall be taken as 135 kg/m3 of mix supplied in bulk produced by Govt. Refineries and 2% Hydrated lime (factory made) Not less than 80% Purity by weight of aggregates as filler material]. The necessary cost adjustment shall be made based on JMF and availability of filler.	2247.00	Cum
11	Painting runway/taxi track/apron marking with adequate nos of coats to give uniform finish with road marking paint of superior make as approved by the Engineer-in-charge, i/c cleaning the surface of all dirt, scales, oil, grease and other foreign mater;al etc. and lining out complete.: New work (Two or more coats)	2267.00	Sqm
12	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 cement : 4 coarse sand (zone-III): 8 graded stone aggregate 40 mm nominal size).	488.00	Cum
13	Providing and laying non-pressure NP4 class (Heavy duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete : 600mm dia. R.C.C. pipe	140.00	Meter
14	Providing and laying non-pressure NP4 class (Heavy duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete : 450mm dia. R.C.C. pipe	90.00	Metre
15	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	226.00	Cum
16	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement. All works upto plinth level - Concrete of M25 grade with minimum cement content of 330 kg /cum	945.00	Cum
17	Steel reinforcement for R.C.C. work including straightening, cutting,bending, placing in position and binding all complete upto plinth level.: Thermo-Mechanically Treated bars of grade Fe-500D or more.	113400.00	Kg
18	Providing and placing in position 100 mm thick factory made machine batched & machine mixed Precast RCC Rectangular Covers on drains of footpath of various sizes, of M-25 grade cement concrete for RCC work, including cost of centering, shuttering, reinforcement of 8 mm dia TMT bars of Fe 500 grade @ maximum 100mm c/c on both ways , neat cement punning on finished surface, properly encased on all edges with 1.6 mm thick , 100 mm wide MS sheet duly painted over priming coat , reinforcement to be welded at edges with MS sheet and providing 2 Nos. 12 mm dia bar for hooks etc i/c cost of cartage, all leads & lift, handling at site etc. all complete as per direction of Engineer-in-Charge.	3600.00	Sqm
19	Centering and shuttering including strutting, propping etc. and removal of form work for :Foundations, footings, bases for columns etc. for mass concrete.	8410.00	Sqm
20	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design : Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total weight of cover and frame to be not less than 208 kg (weight of cover 108 kg and weight of frame 100 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5.	10.00	Each
21	Carrying out CBR test (Soaked & unsoaked) at sugrade level or at locations decided by the Engineer-In-Charge as per IS Code 2720 (Part 16): 1987 and submission of test results as per direction of Engineer -in- Charge. The test should be carried out by the specialised agency/ firm as approved by the Engineer -In Charge.	21.00	Nos
22	Preparation and submission of Structural Design-Study/3 set-Drawings of RCC Drain of approx. 3000m, Pipe Culvert and other related structures at various locations of Airfield pavement along with soft copy,hard copy of Design/Drawings, layout as well as duly vetted them from Govt. Engineering College/NITs/IITs all complete as per direction and satisfaction of Engineer-In-Charge.	1.00	Job
23	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 and for all lift.	2658.00	Cum
24	Extra for depth for manholes : Size 120x90 cm, With common burnt clay F.P.S. (non modular) bricks of class designation 7.5.	10.00	meter

25	Dimantling of flexible pavement (bituminous courses) by mechanical means and disposal of dismanlted material up to a lead of 1 kilometre, as per direction of Engineer-in-charge.	3300.00	cum
26.01	**PAPI Works** Supply, Installation, Testing and Commissioning of 3/4 lamps 01 Set (04 Units) Precision Approach Path Indicator light with totally corrosion proof material, totally enclosed dust and vermin proof IP 54 enclosed made of phosphate aluminum alloy wity powder coated painting in aviation yellow, 6.6 amps series system complete with 200 watt 6.6 amp halogen lamps including lamp assembly, lamp holder/pins, frangible coupling at top and bottom of all legs, aluminium allloy veritcally adjustable legs, anodize aluminium reflectors, toughened front glass, red dichroic filter, secondary leads of length (min 5.0 mtr) with plug and dust proof housing with air filter etc. complete as required and including providing 01 set of all tools etc., Clinometer (02 nos), spirit level, Calibration checking stick with its 04 nos. Base plates for mounting of checking stick etc,complete as required confirming to particular specification, frangibility, calibration report, photometric requirement etc. as per ICAO/FAA/DGCA CAR standard with latest amendment as required and also supplying following spares: (a) 200 watt halogen lamps- 10 Nos (b) Breakable coupling for top & bottom of legs - 4 Nos. (c) Red filters - 4 Nos. (d) Lamp holders - 4 Nos	2.00	Set
26.02	Supply, Installation, Testing and Commissioning of 4KW indoor type, air cooled Constant Current Regulator (CCR) having thyristor control electronic type suitable for use on 230/415V input AC supply with following mentioned output power at 6.6 Amp with 5-step variation of current output and suitable for local & remote control operation with 24/48V DC control supply complete with ammeter, voltmeter, OC, OV, Earth fault protection & earth leakage meter, positive feed back indication equipments, relay contactor etc. as required.	3.00	Set
26.03	Design, Supply, Installation, Testing and Commissioning of Remote Control Panel having provision for control of 02 nos CCRS's, PAPI along with selector switch, Landing T and windsock and 1 CCR spare i/c MIMIC display etc. complete as required.	1.00	Each
26.04	Supply of 1C x 6 sq.mm, 5 KV grade, AFL cable, stranded copper conductor, XLPE insulated PE sheathed, anti-termite & anti rodent treated Airfield Ground Lighting series cable generally confirming to IS 7098 as ammended up to date in conformity with ICAO/DGCA-CAR, complete as required as per specifications.	2850.00	Mtr
26.05	SITC of CI housing box of size 330 mm dia and depth up to 450 mm as per drawing i/c excavation of hard rock/pavement of all types/ concrete/bitumen etc. as required.	37.00	Each
26.06	SITC of completely enclosed rubber covered isolating transformer for use of 6.6 amps series airport lighting circuits having nominal voltage rating of 5KV rated for operation on 50 Hz. Rating: 200 W.	35.00	Each
26.07	Supply, Installation, Testing and Commissioning of IGBT Three level PWM Design based, modular type, true online double conversion type 15 KVA UPS System with harmonic filter suitable to drive constant current regulator (CCR) with 100% unbalanced load at output at full load condition, working on 3 phase, 4 wire, 415Volt, 50Hz and delivering output 3 phase, 4 wire, 415 Volt, 50 Hz, High Efficiency, having SMF Batteries to supporting minimum 30 minutes back up with each UPS, THD less than 3%, Power Factor not less than 0.90, having transfer time of 0 msec., up along with all accessories i.e. breakers, DC cables, cabinets, battery racks, interconnecting links and related items etc. as per site requirement for making the UPS operational and meeting the standard of IEC and as per specification complete as required.	2.00	Job
27.01	**WDI, SNI, WGS, Guidance Signages and Misc. Items** Supply, installation, testing and commissioning of hinged type bottom tiltable LED illuminated wind directional indicator (WDI) confirming to ICAO Annex 14, volume I with upto date ammendments and suitable for operation on 230 V, 50 Hz, single phase AC supply and consists of following complete as required. (a) 5 mtr height FRP frangible lattice type pole/ mast. The frangibility shall confirm to ICAO Annex 14 & Aerodrome design manual part-6/ FAA/DGCA CAR with latest ammendments. The color of pole/ mast shall be preferably aviation yellow or red/white. (b) Wind sock assembly, Truncated fabric wind sock nominal length of 3600 mm and 900 mm dia. (at the larger end) complying ICAO standard including supply of all required materials with SS hardware, slip rings, drum, bracket for drum, bearing, carbon brush with holder etc. (c) Four way Aluminium casting junction box with arm for fixing external lights. Four Each, 20 W nominal capacity LED down light with drivers (having minimum IP65 protection). (d) One no. LED Aviation obstruction light meeting with photometric requirement,having aluminium cast body and red polycarbonate dome, as per requirements of ICAO/DGCA CAR. (e) Internal copper wiring, connection/ interconnection provision for remote control operation. (f) Providing and laying suitable dimension cement concrete foundation of grade 1:2:4 with anchor bolts for installation of WDI as per OEM recommandations and white circular paint around the WDI. (g) Minor civil works including concrete foundation,circular band.The wind direction indicator should be marked by a circular band 15 m in diameter and 1.2 m wide. The band should be centred about the wind direction indicator support and should be in a colour chosen to give adequate conspicuity, preferably white. (h) Any other component required for commissioning of WDI. I/C required contactor or relays for controlling through remote control desk.	1.00	Set
27.02	Design, manufacture, supply, installation, testing and commissioning of slim type edge lit LED Stand Number Indicator sign face size approximate 800 mm x 600 mm to made out of 2 mm thick aluminum frame with suitable angle support, 1.5 mm thick aluminum back cover, 4 mm thick polycarbonate sheet with glare free face, computerized cut letter & symbol on self adhesive vinylsheet(3M/Avery) applied on the inside face of polycarbonate sheet, internally illuminated with required LED module (IP66 Grade) to achieve the required illumination level, 4 mm thick light guide panel for uniform illumination, convertor/ driver, operate on single phase 230 V, 50 Hz AC supply without flickering and conforming ICAO annex 14, including suitable mounting arrangement on existing poles, provision of day night sensor switch for automatic ON and OFF for sign board, supply and laying of 3C 1.5 sqmm power cable from junction box to sign, connection, I/C required contactor or relays for controlling through remote control desk etc. complete as required as per technical specifications.	2.00	Each
27.03	Design, manufacture, supply, installation, testing and commissioning of slim type edge lit LED aircraft stand coordinates sign board of face size approximate 1000 mm x 500 mm made out of 2 mm thick aluminum frame with suitable angle support, 1.5 mm thick aluminum back cover, 4 mm thick polycarbonate sheet with glare free face, computerized cut letter & symbol on self adhesive vinyl sheet (3M/Avery) applied on the inside face of polycarbonate sheet, internally illuminated with required LED module (IP66 Grade) to achieve the required illumination level, 4 mm thick light guide panel for uniform illumination, convertor/ driver, suitable to operate on single phase 230 V, 50 Hz AC supply without flickering and conforming ICAO annex 14, including suitable mounting arrangement on existing poles, provision of day night sensor switch for automatic ON and OFF for sign board, supply and laying of 3C 1.5 sqmm power cable from junction box to sign, connection, I/C required contactor or relays for controlling through remote control desk etc. complete as required as per technical specifications.	2.00	Each
27.04	Design, manufacture, supply and installation of mounting poles/mounting structure as per site requirement suitable for aircraft stand coordinates sign board & Stand Number Indicator sign board for Item Sr. No. 2.02 & 2.03 above including power & communication cable termination boxes etc. including foundation work, finishing etc. complete as required.	4.00	Each
27.05	Supply of non-illuminated Guidance Sign Board of various sizes made out of anodized 3 mm corrosive resistant aluminum extrusion frame (thickness of signboard should be less than 45 mm) and Facia should not be more than 50 mm at all sides of the display. The extrusions frame should be interlocked/bolted with each other creating a sealed unit and 2 mm thick aluminium backcover, 4 mm thick polycarbonate sheet with glare free front face, the letter & symbol should be made by of vinyl and pasted on 4mm thick polycarbonate sheet at the inner side of the sign face with required colouring, 4mm acrylic LGP sheet, suitable arrangement shall be made for water tightness & locking arrangement, including supporting frangible legs & frame etc., complete as required and as specified in ICAO Annex. 14 Vol. I (legends as approved by Engineer-in-Charge).	10.00	Sq.mtr
27.06	Installation, testing & commissioning of Guidance Sign Boards of various size as required and providing all around 150 mm thick PCC of 1500 mm from the edge of sign board.	5.00	Job
27.07	Supply Installation, testing & commissioning of LED Type twin dome red aviation obstruction light fitting made of Die-cast aluminum housing with Red polycarbonate dome with Integral driver and provided with Protection against short-circuit and surge suitable to operate for input voltage range 100 – 270 VAC with LED life time of 50,000 Hrs and fitting Ingress Protection of IP 65 as required.	1.00	Each
28.01	**Perimeter lighting works** Design, Fabrication & Supply of 3 mtrs. OCTAGONAL street light pole with single arm GI bracket (length and tilt angle of bracket shall be based on design) for installation of LED street light luminaire, suitable for wind velocity not less than 47 m/sec., fabricated out of 3 mm thick high tensile sheet steel in single piece construction having 130 mm bottom, 70 mm top, with supply of 4 nos. of foundation bolts & anchor plate, bakelite sheet with 32 Amp heavy duty connector for loop in loop out cable terminations suitable for upto two numbers 4 core 16 Sq.mm cables, suitable for fixing of 2A, 10kA, DP, C series, DP MCB for each fixture connections, earthing bolts for continuous earth connection complete, as required as per technical specifications.	161.00	Each
28.02	Design, Supply & Erection of Energy Efficient 50W or above LED Street Light of efficacy not less than 110 LPW with sufficient number of LEDs, control gear / driver and all other associated accessories and conforming to the degree of protection IP65 complete as required and as specified.	161.00	Nos
28.03	Erection of metallic pole (as mentioned in item No. 3.01) in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling, supply and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, DP miniature circuit breaker suitable for inductive load in the existing MCB DB complete and providing and laying of 3c x 1.5 sqmm PVC insulated flexible copper conductor cable from terminal box to fitting and installation, testing and commissioning of pole, MCB and street light fixtures on street light pole complete etc. as required.	161.00	Job
28.04	Numbering of Perimeter lightning poles etc. as required as per the direction of Engineer-In-Charge.	161.00	Each

29.01	Design, manufacture, supply, installation, erection, testing & commissioning of 16 meter height integral type hot dipped galvanised high mast (as per approved make list of AAI) with in built power tool suitable for wind velocity (apprx. 47m/s)as per IS -875 , luminaries carriage suitable to install luminaries as per lighting design complying ICAO/DGCA CAR standards complete with all accessories like lightning finial, double/triple drum winch, compensating disc, counter weight (of suitable no. LED Flood light luminiaries, but not less than 120W or as approved by E-I-C) etc., head frame, SS wire rope, trailing cable, connectors, mannual handle, junction box complete as required as per manufacturer design. This item also includes following: i) Necessary design & costing of suitable foundation with M25 grade concrete as per site condition or OEM recommended along with all civil materials/supplies i/c supply and erection of suitable nos of foundation bolts, anchor plates, common template, nuts wahsers etc. complete as required. ii) Supply of suitable no. aesthetically designed LED Flood lights as per the lighting design approved by E-I-C to acheive minimum lux level in the area as per ICAO/DGCA CAR standards complete and as per techinical specifications for each high mast. iii)Supply of LED Type low intensity aviation obstruction light suitable for single phase, 230 V, 50 HZ AC supply and as per ICAO standard etc. complete as required for each high mast. iv) Installation, testing and commisioning of all required luminaries including obstruction light as per design with switch gears, lighting protection, required wiring/cabling,cable connection from panel to mast top & fitting, cable connection with lantern carriage & aviation obstruction light, connection and interconnection complete as required I/C required contactor or relays for controlling through remote control desk and as per technical specificaions enclosed. Lux level to be maintained is : Aircraft stand: -horizontal illuminance—20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and -Vertical illuminance—20 lux at a height of 2 m above the apron in relevant directions. Other apron areas: -horizontal illuminance—50 percent of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1 (V)SITC of light starter panel (High Mast outdoor Feeder Pillar Panel) Supply, installation, testing and commissioning of dust & vermin proof ourdoor, IP-54, floor mounted feeder pillar of suitable size on cement concrete foundations generally conforming to IS 5039 and to withstand rough usage and weather, with canopy & suitable for 415V+/-10%, 3 Phase, 4 wire 50 Hz AC supply system. The panel shall be fabricated with 14 SWG M.S.sheet with hinged door on front side with locking arrangement, suitable angle/ channels frame in the bottom, legs for grouting in foundation, openable cable protection covers at bottom portion, painting etc. including supplying and fixing of following accessories and making inter connection, earth connection, neutral link, suitable TPN Bus bars of Aluminium alloy, etc. **Incomer:** (i) 40 Amps.4P,MCCB, C-Series, 10kA - 1 No. MCCB with Thermal magnetic Based releases having O/C, S/C & E/F with spreader links suitable termination of aluminium armoured cable (ii) LED type indicating Lamp with suitable rating 2 Amp SP MCB:- 1 Set (each set comprise of R,Y,B) (iii)Digital type 3 phase Multi-function Meter with suitable rating of MCB & 3 Nos. of single core epoxy resin cast type CTs of 100/5 Amps, 10 VA, CL 1.0 ratings -1 Set. (iv) Auto Manual Switch (v) Power Contactor of 32 Amp with necessary timer & relay for automatic switching of Luminaries. **Outgoing :** (i)1 Nos. of 32 A 4P MCB, C Curve, 10KA. alongwith 01 nos. AC3 Rating 4P ,415V AC, power contactors alongwith 2 nos. auxiliary contact power terminals (1NO+1NC) not less than 32A capacity. 24 Hrs analog type daily timer suitable for 230 V, 50Hz single phase AC supply.- 4 sets (ii)2 Nos. of 16 A TPN MCB, C Curve, 10KA. (iii)1 Nos. of 32 Amps, 415V, 35kA, 4 Pole MCCB with Thermal magnetic Based releases having O/C, S/C & E/F. (iv)LED type indicating Lamp with suitable rating 2 Amp SP MCB:- 1 Set (each set comprise of Red and Green) (v) 15 Amps Socket and switch -1 set	2.00	Job
30.01	**Panels and Feeder Pillars** Supply, installation, testing and commissioning of dust, damp and vermin proof cubicle free floor, Outdor type, IP-65, double door, factory built sheet steel enclosed generally conforming to IS 5039 and to withstand rough usage and weather, suitable for operation on 415 ±10% volts, 50 Hz AC 3 phase 4 wire supply system fabricated out of CRCA sheet steel of 2.0 mm thick for frame work and 2.0 mm thick for doors/ covers, 3mm thick for gland plates i/c cleaning & finishing complete with powder coating in approved shade, having TPN Aluminium bus bars of high conductivity, DMC/SMC bus bar supports, bottom base channel of section not less than ISMC 75mm, entire panel shall have a common copper earth bar of suitable size with 2 nos earth studs, including control wiring with 2.5 sq.mm PVC insulated FRLS copper conductor Single Core cable, cable alleys, cable gland plates, danger notice plates, etc. necessary metering protections & indications and mounted with the following switch gears:- **INCOMER:** i) 125 Amps. 4P , MCCB, 25KA, (Ics = Icu) with thermal magnetic release having O/L & S/C protection equiped with extendable rotary Handle and Spreader Terminals - 2 Set (ii) ON-OFF indication lamps (LED type) with 2 Amp control MCBs. - 2 Set iii) R,Y,B Phase indication LED lamps with 2Amp MCB - 2 Set iv) Multifunction meter, class 0.5 with LCD Display shown V, A, Hz & PF with suitable CL-1 Current transformer- 2 Nos. **BUS-COUPLER:** i) 125 Amps. 4P , MCCB 25, KA (Ics = Icu) with thermal magnetic release having O/L & S/C protection equiped with extendable rotary Handle and Spreader Terminals - 1 Set (ii) ON-OFF indication lamps (LED type) with 2 Amp control MCBs. - 1 Set (iii) Electrical and Mechanical interlocking **BUS-BAR:** TPN aluminium main bus bars of minimum of 200 Amp capacity with heat shrinkable coloured sleeves and i/c DMC/SMC bus bars supports at required intervals complete. **OUTGOING:** (i) 63 Amps. 4P, MCCB, 25KA, (Ics = Icu= 25KA) with thermal magnetic release equiped extendable rotary Handle and Spreader Terminals - 05 Set (ii) 16 Amps. 4P, MCCB, 25KA, (Ics = Icu= 25KA) with thermal magnetic release equiped extendable rotary Handle and Spreader Terminals - 06 Set (iII) ON-OFF indication lamps (LED type) with 2 Amp control MCBs. - 11 Set	1.00	Job
30.02	**Street Light outdoor Feeder Pillar Panel** Supply, installation, testing and commissioning of dust & vermin proof ourdoor, floor mounted feeder pillar of suitable size on cement concrete foundations generally conforming to IS 5039 and to withstand rough usage and weather, with canopy & suitable for 415V+/-10%, 3 Phase, 4 wire 50 Hz AC supply system. The panel shall be fabricated with 14 SWG M.S.sheet with hinged door on front side with locking arrangement, suitable angle/ channels frame in the bottom, legs for grouting in foundation, openable cable protection covers at bottom portion, painting etc. including supplying and fixing of following accessories and making inter connection, earth connection, neutral link, suitable TPN Bus bars of Aluminium alloy, etc. **INCOMER:** i) 63 Amps. 4P , MCCB '25KA, (Ics = Icu) with thermal magnetic release having O/L & S/C protection equiped with extendable rotary Handle and Spreader Terminals - 1 Set (ii) ON-OFF indication lamps (LED type) with 2 Amp control MCBs. - 1 Set iii) R,Y,G Phase indication LED lamps with 2Amp MCB - 1 Set iv) Multifunction meter, class 0.5 with LCD Display shown V, A, Hz & PF with suitable CL-1 Current transformer- 1 No. **BUS-BAR:** TPN aluminium main bus bars of minimum of 100 Amp capacity with heat shrinkable coloured sleeves and i/c DMC/SMC bus bars supports at required intervals complete. **OUTGOING:** (i) 32 Amps. 4P, MCCB, 25KA, (Ics = Icu) with thermal magnetic release equiped extendable rotary Handle and Spreader Terminals - 03 Set (ii) 16 Amps. 4P, MCCB, 25KA, (Ics = Icu) with thermal magnetic release equiped extendable rotary Handle and Spreader Terminals - 01 Set (iii) ON-OFF indication lamps (LED type) with 2 Amp control MCBs. - 4 Set (iv) 24 Hrs Astro timer - 4 No. (v) Contactor and Relay - 4 Set	3.00	Job
31.01	**Cables and HDPE Pipes** Supply of following sizes of XLPE insulated and PVC sheathed XLPE aluminnum conductor armoured cable of 1.1KV grade conforming to IS 7098 (Part-I) with up to date amendments as required 3.5C x 150 Sq.mm	440.00	Meter
31.02	Supply of following sizes of XLPE insulated and PVC sheathed XLPE aluminnum conductor armoured cable of 1.1KV grade conforming to IS 7098 (Part-I) with up to date amendments as required 3.5C x 120 Sq.mm	1320.00	Meter
31.03	Supply of following sizes of XLPE insulated and PVC sheathed XLPE aluminnum conductor armoured cable of 1.1KV grade conforming to IS 7098 (Part-I) with up to date amendments as required 3.5C x 16 Sq.mm	154.00	Meter
31.04	Supply of following sizes of XLPE insulated and PVC sheathed XLPE aluminnum conductor armoured cable of 1.1KV grade conforming to IS 7098 (Part-I) with up to date amendments as required 4C X 10 Sq.mm	5000.00	Meter
31.05	Supply of following sizes of XLPE insulated and PVC sleathed XLPE Copper conductor armoured cable of 1. 1KV grade conforming to IS 7095 (part-I) with up to date amendment as required. 24C X 2.5 Sqmm	200.00	Meter
31.06	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc. , complete as required. 120 mm dia (OD-120 mm & ID-103 mm nominal)	1760.00	Meter

31.07	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (150 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc. , complete as required. 40 mm dia (OD-40 mm & ID-32 mm nominal)	2850.00	Meter
31.08	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc. , complete as required. 40 mm dia (OD-40 mm & ID-32 mm nominal)	5154.00	Meter
31.09	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL/HDPE pipe as required. Above 95 sq. mm and upto 185 sq. mm	1760.00	Meter
31.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL/HDPE pipe as required. Upto 35 sq. mm	8204.00	Meter
31.11	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing masonry open duct as required. Above 95 sq. mm and upto 185 sq. mm	50.00	Meter
31.12	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/ XLPE aluminium conductor cable of 1.1 KV grade as required. 3.5 X 150 sq. mm	4.00	Set
31.13	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/ XLPE aluminium conductor cable of 1.1 KV grade as required. 3.5 X 120 sq. mm	6.00	Set
31.14	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/ XLPE aluminium conductor cable of 1.1 KV grade as required. 4 X 16 sq. mm	8.00	Set
31.15	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/ XLPE aluminium conductor cable of 1.1 KV grade as required. 4 X 10 sq. mm	13.00	Set
31.16	Supplying, and making cable route marker with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) of size 60 cm X 60 cm at the bottom and 50 cm X 50 cm at the top with a thickness of 10 cm including inscription duly engraved as required	185.00	Set
32.01	**Earthings** Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	2.00	Each
32.02	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. (with charcoal/ coke and salt) as required.	27.00	Each
32.03	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	50.00	Mtrs
32.04	Providing and fixing 6 SWG dia G.I. wire below ground level for loop earthing along with existing cable as required.	5000.00	Mtrs
32.05	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	100.00	Mtrs

TYPICAL X-SECTIONS

(A) Pavement Section of Runway/ Apron/ Link Taxiway

DAC =50 mm thick
SDAC= 50 mm thick
WMM =175 mm thick
GSBC= 150 mm thick
Subgrade CBR =5.5%

(B) Combined Pavement Section of Perimeter Road & Shoulder

SDAC=50 mm thick
DBM= 50 mm thick
WMM =175 mm thick
GSBC= 150 mm thick

(C) Pavement Section of Emergency Exit Road/ Vehicular Lane/ GSE Area/ Hard Stand

SDAC =50 mm thick
DBM= 50 mm thick
WMM= 175 mm thick
GSBC= 150 mm thick
Subgrade CBR= 5.5%

(D) Pavement Section for RESA

Suitable material of lesser strength = 150 mm Soaked CBR value of min. 4% and un-soaked CBR value of max. 10% to be achieved with suitable material (for deceleration of Aircraft)
GSBC= 225 mm thick
Subgrade CBR= 5.5%

The above pavement section is based on the following data/ assumptions:

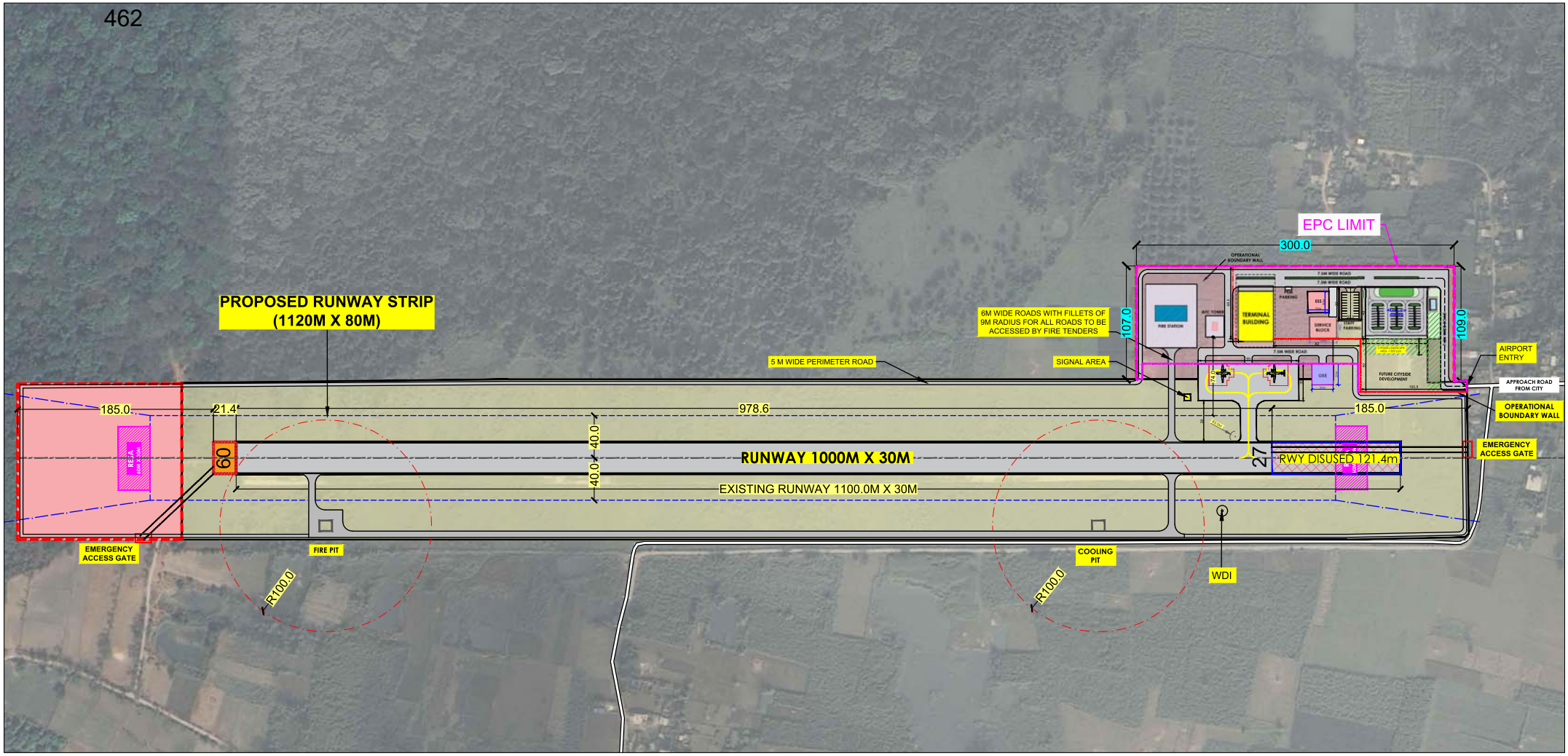
i) Airplane Information:

No.	Name	Gross Wt. tonnes	Annual Departures
1	ATR-72-600	22.68	1200

ii) Structural Design Life = 20 Yrs.
iii) Soaked CBR value = 5.5%
iv) Design traffic assumed = 2.0 msa

Notes:

1. The above cross sections of pavement are of indicative nature and issued for tendering purpose with the purpose to enable the tenderer to make an offer in line with the requirements of AAI.
2. In all pavements, not less than 98% relative compaction as percentage of maximum dry density (MDD), shall be ensured at the subgrade level pavements.
3. Thickness calculated from structural consideration should be examined with that required to satisfy geometrical requirements, drainage including meeting of grade of other adjacent pavements.
4. Proper drainage arrangements may be made as per the site conditions.
5. Soaked CBR value at Subgrade level needs to be check before execution of work.
6. If there is any variation in the above considered parameters/data/ assumptions in the design, then Engineer-in-Charge may be informed for review of design before execution.
7. Discrepancies, noticed if any, shall be brought to the notice of Engineer-in-Charge before execution of work.
8. Contractor should get approval of final Pavement Cross Sections from Engineer-in-Charge before execution of the work.



AREA STATEMENT	
	EXISTING AREA OF AIRPORT (AS PER GoB survey) = 47.57 ACRES (A)
	LAND IDENTIFIED FOR OPERATION OF CODE 2B AIRCRAFT IN VFR = 12 ACRES (B)
	TOTAL LAND REQUIRED FOR CODE 2B IN VFR (A+B) = 59.57 ACRES

PROPOSED AIRPORT DETAILS
RUNWAY - 1000m x 30m
APRON - 2 Nos. Code-2B
TERMINAL BUILDING - 1580 sqm. (GF - 1250 sqm., FF - 330 sqm.)
ATC Tower - 165 sq.m.
Fire Station - 451 sq.m.

* Perimeter roads to be of 5 m width

PROPOSED MASTER PLAN FOR VALMIKI NAGAR AIRPORT (CODE 2B)

AIRPORTS AUTHORITY OF INDIA
DIRECTORATE OF PLANNING
ARCHITECTURAL CELL
'C' BLOCK, RAJIV GANDHI BHAWAN, NEW DELHI