



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT

Name of work:- Road carpeting work in BHEL premises for year 2012-13.

TENDER NOTICE NO. FCX / TE / 2 / 06 / R

DT 31/08/2012

## TENDER

**(TENDER No. FCX / TE / 2 / 06 / R)**

**Road Carpeting work in BHEL premises for year 2012-13**



**FACTORY CIVIL DEPARTMENT  
BHARAT HEAVY ELECTRICALS LIMITED  
(A Government of India Undertaking)  
JHANSI – 284129 (U.P.)**

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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TENDER NOTICE NO. FCX / TE / 2 / 06 / R DT 31/08/2012

**NOTICE INVITING TENDER**

From :  
DGM (Civil & Estate)  
BHEL-JHANSI,  
Pin- 284129 (UP)  
To : M/s \_\_\_\_\_  
\_\_\_\_\_

Dear Sir,

**SUB: Road Carpeting work in BHEL premises for year 2012-13**

Sealed Tenders in two parts (i) Techno-commercial bid & (ii) Price Bid are invited for the work mentioned above from bidders who fulfill the qualifying criteria as mentioned below:

Nature of work	Time of completion	Estimated tender Value	Earnest money deposit (in Rs)	Last date of issue of Tender date & time	Tender submission date & time	Tender opening (Part 1) date & time
<b>Road Carpeting work in BHEL premises for year 2012-13</b>	6 Months	Rs.75.00 Lakhs	Rs.1.50 Lakhs To be accompanied with techno-comm. bid (Part 1)	27/09/12	28/09/12 by 1.00 PM	28/09/12 by 2.00 PM

Cost of tender documents: **Rs.1135/- ( 1000 + Vat @ 13.5%)**

Address for submission & opening of Tender:

**If through courier;**

**Office of** DGM(Civil & Estate)  
BHEL JHANSI-284129(UP)  
Tel : 0510-241-2785/2385,  
Fax : 0510- 2412119

**If delivered in tender box;**

Tender Box Provided At  
Adm. Building Main Gate  
CISF Security Room,  
BHEL-JHANSI 284129(UP)

E-mail:kdg@bheljhs.co.in, rks@bheljhs.co.in

The tender document can be downloaded from our website **www.bhel.com**. Bidders downloading the tender document may enclose the cost of tender along-with the techno-commercial bid in form of DD in favour of BHEL Jhansi payable at Jhansi. Tender document can be obtained in person by contacting office of the **DGM (Civil & Estate)** along-with request letter and tender cost. Your offer is to be submitted in two parts in two separate sealed envelopes properly marked "Part-I Techno-Commercial Bid, **TENDER No. FCX / TE / 02 / 06 / R** " & "Part-II Price Bid, **TENDER No. FCX / TE / 02 / 06 / R** " respectively and these two envelopes to be put in third sealed envelope properly marked:

**"Road Carpeting work in BHEL premises for year 2012-13**

**TENDER No. FCX / TE / 02 / 06 / R Due date: "28/09/2012"**

**Part-I Techno Commercial bid:**

Part I of the sealed tenders alone will be opened by BHEL in the presence of tenderers who are present at the time & place of opening. A signed blank price-bid copy should be enclosed with this bid. The spaces for prices should be crossed (/).

NOTE: Contractor has to submit bar chart/ pert chart (L1 Chart) along with techno- commercial bid.

**Part-II Price bid:**

The price bid should contain prices only. Price bid will be opened only for the parties who qualify in techno commercial bid.

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TO BE SIGNED BY THE TENDERER

Certified that all Sections of the Tender have been read / complied & agreed to, and each page of the tender offer has been signed & stamped.

(Signature of Authorized person(s))  
Name and designation of Authorized  
Person(s)  
Signing the tender on behalf of the tenderer

Signature, seal & issuing authority

Sign, seal & date of contractor



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**Brief Description of Work**

The road carpeting work is to be done inside factory area, out side factory area and township. The work consist of repairing of existing roads, filling pit holes , making kerbing laying of tack coats , carpeting on WBM roads and existing bituminous roads . All Road carpeting work must be done by paver machine only.

**QUALIFYING CRITERIA**

The work is specialized in nature which requires skilful workmanship & timely completion. All the following criteria will have to be met and documentary proof in support of the same to be submitted along with Techno Commercial Bid. Only those parties meeting the following criteria shall be eligible for opening of price bids. The decision of BHEL in this regards shall be final.

**(I) FINANCIAL**

- (1) The Bidder should have an Average Annual financial turn over during the last 3 years, ending 31<sup>st</sup> March 2012 not less than **Rs. 22.50 Lakhs**.
- (2) The bidder should have the experience of successfully completing similar works during the last seven years ending 31.07.2012 amounting to values mentioned as under in a completed contract. ( running contract in a BHEL unit will acceptable along with certificate of satisfactory work performance from Engineer – in- Charge)
  - a) Three similar completed works each costing not less than the amount equal to **Rs. 30.00 lakhs**
  - Or**
  - b) Two similar completed works each costing not less than the amount equal to **Rs 37.50 lakhs**
  - Or**
  - c) One similar completed work costing not less than the amount equal to **Rs 60.00 lakhs**

**Definition of similar work(s):** All types of bituminous Road carpeting work .

- (3) The Bidder should possess PAN No, Service Tax Number (PAN based), TIN No. and submit a copy of the supporting documents along with tender documents.

**(II) HR and Legal**

- (1) The bidder is required to obtain PF registration, ESI registration and Central Labour License before start of work. If the bidder already has these documents, they must be submitted along with techno-commercial bid. If not, the bidder must submit affidavit of obtaining PF, ESI registrations and Central Labour License within 15 days of issue of Letter of Intent by the department. Work at site will be permitted only after all the above requirements are fulfilled and documents submitted to BHEL
- (2) The bidder must sign self declaration of compliance to all statutory and legal requirements of Appropriate Government and other Legal Authorities.
- (3) The bidder must submit self declaration of having never been blacklisted from any BHEL unit or any State / Central Government department / PSU
- (4) The bidder must submit self Certificate declaring the firm and its proprietor/partners/Directors has never been found guilty by a court for crimes of fraud , dishonesty or moral turpitude

**(III) Technical Proficiency**

- (1) The bidder must submit the list of tools, plants and machinery available with them
- (2) The bidder must submit the list of technical and skilled manpower available with them

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### REVERSE AUCTION

BHEL may go for Reverse Auction (on line bidding on Internet) instead of opening the submitted sealed price bid. The decision to go for Reverse Auction will be taken after techno-commercial evaluation. Information and general terms and conditions governing RA are given below

- (2.1) For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
- (2.2) BHEL will engage the services of a Service Provider who will provide all necessary training and assistance/ demonstration before commencement of on line bidding on internet.
- (2.3) BHEL will inform the Contractors in writing the details of Service Provider to enable them to contact for training/ demonstration.
- (2.4) Business rules like event date, time, start price, bid decrement, extensions etc. also will be communicated through Service Provider for compliance.
- (2.5) Contractors have to fax the Compliance form in the prescribed format (provided by Service provider) before start of Reverse Auction. Without this, the contractors will not be eligible to participate in the event.
- (2.6) BHEL will provide the calculation sheet which will help the Contractors to arrive at "Total Cost to BHEL" by including items like Taxes and Duties and loading factors (for non-compliance to BHEL Commercial terms & conditions, if any) for each of the Contractors to enable them to fill-in the price and keep it ready for keying in during the Auction.
- (2.7) Reverse auction will be conducted on a scheduled date & time.
- (2.8) At the end of Reverse Auction event, the lowest bid value will be known on the network.
- (2.9) The lowest bidder has to fax the duly signed filled-in prescribed format as provided to BHEL through Service Provider within 24 hours of Auction without fail.
- (2.10) Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of contractors to conduct business with BHEL as per prevailing procedure.
- (2.11) In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids already submitted and available with BHEL shall be opened as per BHEL's standard practice.

#### NOTES:

- I) No conditional tender will be accepted.
- II) Valuation will be on total of all schedules. And L1 (lowest bidder) will be decided on overall basis only
- III) BHEL reserves the right to delete any items of works or reject incomplete offers.

### INSTRUCTIONS TO TENDERERS

**1.0** The **techno-commercial bid** comprising (i) all its sections, (ii) all enclosures in support of various clauses and requirements and (iii) EMD, shall be duly signed and sent in a sealed envelope boldly super-scribing "**PART-I TECHNO COMMERCIAL BID for Road Carpeting work in BHEL premises for year 2012-13**". Similarly the **Price-Bid** must be duly signed and sent in a sealed envelope boldly super-scribing "**PART-II PRICE BID FOR Road Carpeting work in BHEL premises for year 2012-13**". Both these envelopes shall be placed inside 3<sup>rd</sup> sealed envelope super-scribing" duly signed and sent in a sealed envelope boldly super-scribing "**Road Carpeting work in BHEL premises for year 2012-13**".

The tender shall be addressed to as follows :

- i. R.K.Srivastava
- ii. DGM (Civil & Estate)
- iii. BHEL, JHANSI - 284129

Signature, seal & issuing authority

Sign, seal & date of contractor



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Sealed Tenders can be submitted (i) personally, (ii) by Courier, or (iii) by post.  
**If through courier or post; Office of DGM (Civil & Estate)** **If delivered in tender box;**

BHEL JHANSI-284129(UP)  
Tel : 0510-241-2785/2285,  
Fax : 0510- 2412119

Tender Box Provided At  
Adm. Building Main Gate  
CISF Security Room,  
BHEL-JHANSI 284129(UP)

- 2.0 Tenders should be sent/posted with due allowance for any transit/postal delay. The tenders received after due date and time of opening are liable to be rejected.
- 3.0 Tenders shall be opened by authorized officer of BHEL at his office at the time and date as specified in the tender notice in the presence of such of those tenderers or their authorized representative who may be present.
- 4.0 The tenderers shall closely peruse all the clauses, specifications and drawings indicated in the Tender Documents before quoting. If the tenderer have any doubt about the meaning of any portion of the Tender Specifications or find discrepancies / omissions in the drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect scope of work etc., he shall at once contact the authority inviting the tender for clarification before the submission of the tender and obtain clarification during the pre bid meeting.
- 5.0 Before tendering, the tenderers are advised to inspect the site of work and the environments and be acquainted with the actual working and other prevalent conditions, facilities available, position of material and labour. No claim will be entertained later on grounds of lack of knowledge after submission of the tender.
- 6.0 Tenderer must fill the schedules and furnish all the required information as per the instructions given in various sections of the tender document and specification. Each and every page of the Tender Specification must be SIGNED, STAMPED AND SUBMITTED ALONG WITH THE OFFER by the tenderer in token of complete acceptance thereof. The information furnished shall be complete by itself.
- 7.0 The tenderer shall quote the rates after visiting the site to know the site conditions. The tenderer shall quote the rates in English Language using international numerals. These rates shall be entered in figures as well as in words. In case of difference in rates between words and figures, the rate quoted in WORDS shall be treated as final rates. For the purpose of the tender, the metric system of units shall be used.
- 8.0 All entries in the tender shall either be typed or be written in ink. Erasures and overwriting are not permitted and may render such tenders liable to summary rejection. The tenderer shall duly attest all cancellations and insertions prior to submission of tender.
- 9.0 **DATA TO BE ENCLOSED.**  
Full information shall be given by the tenderer in respect of the following. Non submission of these information may lead to rejection of the offer.
- 9.1 **FINANCIAL STATUS.**  
Financial viability as per Proforma enclosed at ANNEXURE `A' including Permanent Account Number issued by Income tax department.
- 9.2 **BLANK & SIGNED PRICE-BID**  
A copy of blank & signed price-bid should be enclosed with the techno-commercial bid. The space for prices may be crossed (/).
- 9.3 **PREVIOUS EXPERIENCE:**  
A statement giving particulars (duly supported by documentary evidence) of the various services rendered/in progress for each similar works by the tenderer

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indicating the particulars and value of each work, the site location, the duration, date of completion etc. as per performa – ANNEXURE-`B`

**9.4 ORGANISATION CHART:**

9.4.1. The organization pattern indicating name, qualification and experience of engineer present at senior level in the roll of the company as on 31.10.10.

9.4.2. Details of construction equipments in support of their capability and satisfactory completion of the project.

9.5 An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole Proprietor, shall also be attached.

9.6 IN CASE OF AN INDIVIDUAL: His full name, experience, address and nature of business.

OR

IN CASE OF PARTNERSHIP FIRMS: The names of all the partners with addresses and their experience. A copy of the partnership deed/Instrument of Partnership duly certified by a Notary Public shall be enclosed.

OR

IN CASE OF COMPANIES: Date and place of registration including date of commencement certificate in case of public companies and the nature of business carried on by the Company. Certified copies of memorandum and Articles of Association are also to be furnished. Also indicate names, addresses and experience of the Directors.

9.7 Declaration sheet as per Performa enclosed at ANNEXURE`C`.

9.8 Check list and schedule of general particulars duly filled in, signed and stamped as per ANNEXURE `D`.

9.9 In addition to the above the particulars required elsewhere in tender documents.

9.10 Mention your PF code No. allotted to you by the Regional Provident Fund Commissioner.

9.11 Mention your ESI code no or any other medical policy prevailing in your company.

9.12 Mention your Service Tax Registration No.(PAN based) issued by Central Excise Department.

**Note:** In terms of clauses 9.1 to 9.12 above, all the data required to be enclosed with the tender need to be furnished neatly typed, signed and stamped in the given formats only (in the form of separate sheets) failing which the tender may be considered as incomplete and is liable for rejection. Documentary, proofs wherever necessary also need to be enclosed.

**10 EARNEST MONEY DEPOSIT:**

Every tender must be accompanied by the prescribed amount of Earnest Money Deposit in any one of the following forms.

**(Note: Cheques, Money Orders or Postal Orders will not be accepted.)**

10.1 **Cash:** The amount should be remitted by the party to the Cashier of Bharat Heavy Electricals Limited Jhansi and cash receipt issued by him shall be enclosed along with the tender as permissible under **IT, act. OR**

10.2 Demand Draft from any Nationalized Bank in favour of Bharat Heavy Electricals Limited, JHANSI.

10.3 Tenders received without Earnest Money in full in the manner prescribed above will not be considered.

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- 10.4 The Earnest Money Deposit of the successful tenderer shall be converted & adjusted against security deposit.
- 10.5 In the case of unsuccessful tenderers, the Earnest Money will be refunded to them after finalization of the tender.
- 10.6 BHEL reserves the right of forfeiture of Earnest Money in case the tenderer:
- 10.6.1 Submits false information.
- 10.6.2 After opening of Tender, revokes/withdraws his tender within the validity period or revises/alters his earlier quoted rates/conditions.
- 10.6.3 Fails to commence the work within fifteen days from the date of issue of 'letter of intent'.
- 10.6.4 Fails to submit 50% of the total security deposit before start of work.
- 10.6.5 Fails to start the work as may be indicated in the Letter of Intent.
- 10.7 EMD to be submitted along with techno commercial bid only and not in price bid .
- 10.8 No adjustment of earlier EMD/Security deposit, if any, shall be permitted.

11.0 **AUTHORISATION, ATTESTATION & VALIDITY OF OFFER:**

Tenders shall be signed by persons duly authorized /empowered to do so. Certified copies of such authority and relevant documents shall be submitted along with the tenders. The offer shall be kept open for acceptance for a minimum period of 6 months from the date of opening of tenders. In case Bharat Heavy Electricals Limited calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer, which shall be binding, on the tenderers

12.0 **RATES OFFERED & EVALUATION OF BIDS:**

- 12.1 Rates quoted should be inclusive of all taxes and duties excluding service tax as applicable against documentary proof.
- 12.2 The quantities mentioned are tentative and liable to change as per site condition at the time of execution as per description of engineer in charge.
- 12.3 Payment under this contract shall be released as per General Condition of Contract(GCC) BHEL, Jhansi as per schedule of activities on satisfactory completion of stages of work in all respects against the invoices supported by necessary documents effecting due deductions.
- 12.4 **Percentage premium or discount on DSR 2007 rates is to be quoted for item no 1 to 15 of Bill of quantity as per CPWD, DSR 2007 items in Indian Rupees.**
- 12.5 The lowest bidder will be evaluated on overall basis .
- 12.6 No advance payments will be made.
- 12.7 Rates should be kept valid for 6 months from due date of tender opening .

13.0 **EXECUTION OF CONTRACT:**

The successful Tenderer's responsibility under this contract commences from the date of issue of the Letter of Intent by Bharat Heavy Electricals Limited. The successful tenderer shall be required to execute a contract in the "Prescribed form" as per GCC with BHEL within 15 days after the acceptance of his tender and in any case before the commencement of work. The expenses for completion and stamping and registration of the agreement with prescribed authority, if necessary shall be borne by the Contractor.

14.0 **SECURITY DEPOSIT**

Upon acceptance of tender, the successful tenderer must deposit the required amount of security deposit within the time specified in the letter of intent for satisfactory completion or work.

- 14.1 The total amount of Security shall be deposited as per clause 14.2.2 .

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- 14.2 The Security Deposit will be deposited within 15 days from the date of issue of letter of intent but before start of work in any one of the following forms.
- 14.2.1 The total Security Deposit as indicated in the Letter of Intent has to be submitted in cash or as per clause 14.2.2 herewith as under :
- 14.2.2 The rate of Security Deposit will be as below:
- a)Rs 4 lakhs + 5% of the amount exceeding Rs 50 Lakhs.
  - b)The security deposit will be collected before start of the work by the contractor.
  - c)Security deposit may be furnished in any of the following forms:
    - (i) Cash (as permissible under the Income Tax Act)
    - (ii) Pay Order, Demand Draft in favour of BHEL, Jhansi.
    - (iii) Securities available from Post Offices such as National Saving Certificates, Kisan Vikas Patras etc. (Certificates should be held in the name of contractor furnishing the security and duly pledged in favour of BHEL, Jhansi and discharged on the back).
    - v) Bank Guarantee from Scheduled Banks/Public Financial Institutions as defined in the Companies Act subject to maximum of 50% of the total security deposit value. The balance 50% has to be remitted either by cash or in the other form of security. The Bank Guarantee format should have the approval of BHEL, Jhansi.
    - vi) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL Jhansi, duly discharged on the back.
    - vii) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit will be collected before start of work and the balance 50% may be recovered from the running bills
- Note:** Acceptance of the Security Deposit against SI No (iv) and (vi) above will be subject to hypothecation or endorsement on the documents in favour of BHEL, Jhansi. However BHEL, Jhansi will not be liable or responsible in any manner for the collection or interest or renewal of the documents or in any other matter connected therewith.
- 14.2.3 The validity of the Bank Guarantee furnished towards Security Deposit under 14.2.2 above shall be up to the period of completion of work as stipulated in the Letter of Intent + Guarantee period + 3 months claim period.
- 14.3 If the value of the work done at any time exceeds the accepted agreement value, the Security Deposit shall be correspondingly enhanced and the extra Security Deposit shall be immediately deposited by the Contractor or recovered from payments due to him.
- 14.4 **Stamp Duty** - Contractor should deposit stamp duty on security deposit as per Indian Stamp Act 1899 and amendment made there under ,applicable UP stamp duty rules and will have to be deposited before commencement of the contract.
- 14.5 Adjustment of Earnest Money Deposit towards part of Security Deposit shall be done as per clause 10.4 above.
- 14.6 BHEL reserves the right to forfeit the Security Deposit in addition to other claims and penalties in the event of the Contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract. BHEL reserves the right to set off the Security Deposit, against any claims of any other contracts with BHEL.
- 14.7 RETURN OF SECURITY DEPOSIT:**  
If the contractor fully performs and completes the works in all respects to the entire satisfaction of BHEL and presents an absolute "No Demand Certificate" in the prescribed form and return properties belonging to BHEL taken, borrowed or hired by him for carrying out the said works, half the amount of Security Deposit will be released to the contractor after deducting all costs, expenses and other amounts that are to be paid to BHEL under this or other contracts entered into with the contractor along with payment of final bill. It may be noted that in no case the Security Deposit shall be refunded / released prior to passing of final bill. Balance half of the amount of security deposit will be released only after 'defects liability period' of 12 months from the date of completion and on submission of proof of compliance of PF, ESI, Service tax payment and labour laws etc .

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- 15.0 No interest shall be payable by BHEL on Earnest Money, Security Deposit or on any money due to the Contractor by BHEL.
- 16.0 **REJECTION OF TENDER AND OTHER CONDITIONS:**  
The acceptance of Tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever.
- 16.1.1 To reject any or all of the tenders
- 16.1.2 To modify the time for completion suitably.
- 16.2 Conditional tenders, tenders containing absurd or unworkable rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.
- 16.3 If a tenderer expires after the submission of his tender or after the acceptance of his tender, BHEL may at its discretion, cancel such tender. If a partner of a firm expires after the submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at its discretion unless the firm retains its character.
- 16.4 BHEL will not be bound by any Power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. BHEL may, however, recognize such Power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
- 16.5 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded and forfeit the Earnest Money/Security Deposit/any other moneys due.
- 16.6 Should a tenderer or Contractor or in the case of a firm or Company of Contractors/one or more of its Partners/Shareholders/Directors have a relation or relations employed in BHEL, the authority inviting tender shall be informed of the fact along with the offer, failing this BHEL may at its sole discretion reject the tender or cancel the contract and forfeit the Earnest Money/Security Deposit.
- 16.7 The successful tenderer should not sub-contract the part or complete work detailed in the tender specification without written permission of BHEL. The tenderer is solely responsible to BHEL for the work awarded to him.
- 17.0 The following terms and expression shall have the meaning hereby assigned to them except where the context otherwise requires.
- 17.1 BHEL shall mean Bharat Heavy Electricals Limited, a Company registered under the Indian Companies Act, 1956 with its Registered Office at BHEL House, Siri Fort, New Delhi Pin – 110 049 or its authorised Officers or its Engineer or other employees authorised to deal with any matters with which these persons are concerned, on its behalf.
- 17.2 CLIENTS OF BHEL' or 'CUSTOMER' shall mean the project authorities to whom BHEL is supplying the equipment's.
- 17.3 'CONTRACTOR' shall mean the individual, firm or Company who enters into contract with BHEL and shall include their executors, administrators, successors and permitted assigns.
- 17.4 'CONTRACT' or 'CONTRACT DOCUMENT' shall mean and include the agreement, the work order, the accepted appendices of rates, schedules of quantities, if any, General Conditions of Contract, Special Conditions contract, of Instructions to Tenderers, the drawings, the technical specifications, the special specifications, if any, the tender documents and the Letter of Intent/Acceptance letter issued by BHEL. Any conditions or terms stipulated by the tenderer in the tender documents or subsequent letters shall not form part of the contract unless specifically accepted in writing by BHEL in the letter of intent and incorporated in the Agreement.
- 17.5 'TENDER DOCUMENTS' shall also include the 'General Conditions of Contract' (GCC) of BHEL. If there is any duplication or deviation between the GCC and the 'instructions and terms & conditions' mentioned in pages 12-62, the latter shall prevail. Where-ever the latter is silent; the former shall be referred to.
- 17.6 Letter of Intent shall mean the intimation by a letter/telegram /fax to the tenderer that the tender has been accepted in accordance with provision contained in that letters. The

Signature, seal & issuing authority

Sign, seal & date of contractor



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responsibility of the contractor commences from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.

- 17.7** COMPLETION TIME shall mean the period by date specified in the Letter of Intent or date mutually agreed upon for handing over the erected equipment/plant which are found acceptable by the Engineer being or required standard and conforming to the specifications of the contract.
- 17.8** 'TESTS' shall mean and include such test or tests to be carried out by the contractor as are prescribed in the contract or considered necessary by BHEL in order to ascertain the quality, workmanship, performance and efficiency of the contracted work or part thereof.
- 17.9** 'APPROVED', 'DIRECTED' or 'INSTRUCTED' shall mean approved, directed or instructed by BHEL.
- 17.10** 'WORK' or 'CONTRACT WORK' shall mean and include supply of all categories of labour, specified consumables, tools and tackles required for complete and satisfactory site transportation, handling, stacking, storing, erecting, testing and commissioning of the equipment's to the entire satisfaction of BHEL.
- 18.0** **LAW GOVERNING THE CONTRACT AND COURT OF JURISDICTION**  
The contract shall be governed by the law for the time being in force in the Republic of India. The Civil Court at Jhansi having ordinary Original Civil Jurisdiction shall alone have exclusive jurisdiction in regard to all claims in respect of this Contract.
- 19.0** **COMMENCEMENT & COMPLETION OF WORK (Pl. also refer clauses 12 & 31 of General conditions of contract of BHEL Jhansi)**  
The contractor shall commence the work within the time indicated in the Letter of intent and shall proceed with the same with due expedition without delay.
- 19.1.1** If the successful tenderer fails to commence the work within the stipulated time, BHEL, at its sole discretion, will have the right to cancel the contract. His Earnest money and/or Security Deposit will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.
- 19.1.2** All the works shall be carried out under the direction and to the satisfaction of BHEL.
- 20.0** **MEASUREMENT OF WORK AND MODE OF PAYMENT**
- 20.1** All payments due to the contractor shall be made by 'Electronic Fund Transfer'. For this purpose the contractor has to give his account details in the standard format to be provided by BHEL Jhansi.
- 20.2** All payments will be made as per "Price Schedule" only after completion of that work. The same will be entered in measurement Book as running account (RA bill) & both the party will sign in that.
- 20.3** All recoveries due from the contractor for the month/period shall be effected in full from corresponding running bills unless specific approval from competent authority is obtained to the contrary. The recoveries could be I.Tax, VAT, Water charges etc.
- 20.4** Measurement shall be restricted to that quantity for which it is required to ascertain the financial liability of BHEL under this contract.
- 20.5** The contractor shall bear the expenditure involved if any, in meeting requirements. The contractor shall, provide all the assistance with appliances and other thing necessary for measurement or re-measurement.
- 20.6** Passing of bills covered by such measurement does not amount to acceptance by BHEL of the completion of the work measured. Any left out work has to be completed by the Contractor, as directed.
- 20.7** Final measurement bill shall be prepared in the proforma prescribed for the purpose, based on the certificate issued by the Engineer that the entire work as stipulated in the tender specifications has been completed in all respect to the entire satisfaction of BHEL. The Contractor shall give unqualified 'No claim' and 'no demand' certificate. The abstract of final quantities and financial values shall also be entered in the measurement book and signed by both the parties. The final bill shall be paid within a reasonable time after completion of the work. After the payment of final bill, only the

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guarantee obligation percentage value shall remain unpaid, which will be released as per GCC.

**NOTE :** Normally it takes approximately 60 days for the payments to be released by BHEL after recording the measurements.

**21.0 RIGHTS OF BHEL**

BHEL reserves to itself the following rights in respect of this contract without entitling the contractor to any compensation.

**21.1** To get the work done through another agency at the risk and cost of contractor, in the event of poor progress or the contractor's not starting the work, after once shifting it, poor progress or inability to progress the work for completion as stipulated in the contract, poor quality of work persistent disregard of instructions of BHEL assignment, transfer, subletting of the contracted work without written permission of BHEL, non-fulfillment of any contractual obligations etc. and to claim/recover compensation for such losses from the contractor including BHEL's supervision charges and overheads from Security Deposit / other dues in addition to any other action that may be taken.

**21.2** To withdraw any portion of work and/or to restrict/alter quantum of work as indicated in the contract during the progress of erection and get it done through another agency and/or by the departmental labour to suit BHEL's commitments to its customer or in case BHEL decides to advance the completion due to other emergent reasons/BHEL's obligation to its customer.

**21.3** To terminate the contract after due notice and forfeit the Security Deposit and recover the loss sustained in getting the balance work done through other agencies in addition to liquidated damages in the event of:

**21.3.1** Contractor's continued poor progress.

**21.3.2** Withdrawal from or abandonment of the work before completion of the work

**21.3.3** Corrupt act of the contractor.

**21.3.4** Insolvency of the contractor

**21.3.5** Persistence disregard of the instructions of BHEL Assignment, transfer, subletting of the contract work without BHEL's written permission

**21.3.6** Non-fulfillment of any contractual obligations or obligations under the law

**21.4** To recover any money due from the Contractor from out of any moneys due to the contractor under this or any other contract or from the Security Deposit.

**21.5** To claim penalty or compensation for losses sustained including BHEL's supervision charges and overheads in case of termination of contract and/or to levy liquidated damages for delay in completion of work (Pl. refer cl. 32 of GCC of BHEL Jhansi).

**21.6** To restrict or increase the quantity and nature of work to suit site requirements, since the tender specification is based on preliminary documents and quantities furnished therein are indicative and approximate and the rates quoted shall not be subjected to revision.

**21.7** To deploy BHEL's skilled and semiskilled workmen in case of emergency/poor progress/deficiency in skill on the part of the employees of the contractor and to recover the expenditure on account of the same from the money due to the contractor.

**21.8** While every endeavor will be made by BHEL to this end, BHEL cannot guarantee uninterrupted work due to conditions beyond its control. The contractor will not be entitled to any compensation/extra payment on this account.

**21.9** In the event of any dispute of technical nature, the decision of BHEL shall be final and binding on the Contractor.

**22.0 CONSEQUENCES OF CANCELLATION**

Whenever BHEL exercises its authority to terminate the contract and withdraw a portion of work under clause 23, the work may be got completed, by any other means, at the contractor's risk and cost provided that in the event of the cost of completion (as certified by the Engineer which shall be final and binding on the contractor) being less than the contract value, the advantage shall accrue to BHEL. If the cost of completion exceeds the moneys due to the contractor under the contract, the contractor shall either pay the excess amount demanded by BHEL or the same shall be recovered from the contractor. This will be in

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addition to the forfeiture of Security Deposit and recovery of liquidated damages as per relevant clauses.

- 22.1 In case BHEL completes the work under the provisions of this clause, the cost of such completion to be taken into account for determining the excess cost to be charged to the contractor shall consist of cost of material purchased and/or labour provided by BHEL with an addition of such percentage to cover supervision and establishment charges as may be decided by BHEL.

**23.0 FORCE MAJEURE**

- 23.1 The following shall amount to force majeure conditions. Acts of God, act of any Government, war, sabotage, riots, civil commotion, police action, revolution, flood, fire, cyclone, earthquake, epidemic and other similar causes over which the contractor has no control.

- 23.2 If the contractor suffers delay in the due execution of the contract, due to delays caused by force majeure conditions, as defined above, the agreed time for completion of the work covered by this contract shall be extended by a period of time equal to the period of any such contingency provided the contractor immediately reports about the same to BHEL in writing supported by documentary evidence but the Contractor shall not be eligible for any compensation on this account.

**24 GUARANTEE**

The satisfactory and safe performance of the work done by the contractor shall be guaranteed up to 12 Month (One Year) from the date of the completion of work. During this period of the responsibility of contractor shall be to attend all meetings with BHEL, Jhansi and to attend & reply all the matters relating to the design / contract work as may be required. 50% of the security deposit calculated as per BHEL Policy, shall be retained by BHEL during passing of final bill against the performance guarantee during the defect liability period.

**25.0 ARBITRATION**

All disputes between the parties to the contract arising out of or in relation to the contract, other than those for which the decision of the Engineer or any other person is by the contract expressed to be final and conclusive, shall, after written notice by either party to the contract to the other party, be referred to sole arbitration of the Unit head of BHEL Jhansi or his nominee. The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration Act, 1996.

- 25.1 The parties to the contract understand and agree that there will be no objection that the Unit head of BHEL Jhansi or the person nominated as arbitrator had earlier in his official capacity to deal directly or indirectly with the matters to which the contract relates or that in the course of his official duties had expressed views on all or any of the matters in dispute or difference. The award of the arbitrator shall be final and binding on the parties to this contract.

- 25.2 In the event of the arbitrator dying, neglecting or refusing to act or resigning or being unable to act for any reason or his award being set aside by the Court for any reason, it shall be lawful for the Unit head of BHEL Jhansi or his successor, as the case may be, either to act himself as the Arbitrator or to appoint another arbitrator in place of the outgoing arbitrator in the manner aforesaid.

- 25.3 The arbitrator may, from time to time, with the consent of both the parties to the contract, enlarge the time for making the award. Work under the contract shall be continued during the arbitration proceedings. The venue of the arbitration shall be the place from which the contract is issued or such other place as the arbitrator at his discretion may determine.

- 25.4 Wherever the above sub-clauses are silent w.r.t arbitration, Cl.50 of GCC shall be referred to.

**26 Responsibilities of contractor.**

- 26.1.1 The contractor shall be fully and finally responsible for correctness and quality of his work to the entire satisfaction of the BHEL/Customer.

- 26.1.2 The work shall be executed in accordance with the directions, instructions, drawings and specifications, which shall be given to the contractor by BHEL from time to time.

- 26.1.3 If in the opinion of the contractor any work is insufficiently specified or required modifications, the contractor shall refer the same in writing to the Engineer and obtain his

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instruction/approval in writing before proceeding with the work. If contractor fails to refer such instance, any excuse for faulty erection, for poor workmanship or delay in completion shall not be entertained.

- 26.1.4 The contractor will be required to make agreement with BHEL on Non-Judicial stamp paper of Rs.100/- as per Annexure-"H" and Annexure I for Indemnity bond..
- 26.1.5 The following are the responsibilities of the contractor in respect of observance of local laws, employment of personnel, payment of taxes etc. The contractor shall engage sufficient staff to maintain the required rate of progress and quality of workmanship. If unskilled workers are required to be engaged, the same shall be engaged, as far as possible, from local areas in which the work is being executed.
- 26.1.6 Material reconciliation statement has to be submitted by the contractor as & when required by BHEL.

**TERMS & CONDITIONS OF THE TENDER**

The contractor shall comply with the following general terms, conditions and special instructions.

1. The contractor shall fully comply with the following enactments:
  - a. Contract Labour (R&A) Act, 1971. Including Payment of Bonus Act ,1965.
  - b. Wage Rates not less than that notified by State Labour department from time to time.
  - c. Payment of Wages Act.
  - d. ESI Act, 1948.
  - e. EPF Act, 1952.
  - f. Workmen's Compensation Act, 1923.
  - g. Stamp duty Act, 1898
  - h. The company's instructions as issued from time to time in regard to working hours, wages, leave, holidays etc.
  - i. Minimum wages Act,1948
2. The Contractor shall obtain license from the appropriate Labour Commissioner's office, of appropriate Government if he engages 20 (Twenty) or more workmen only.
3. The contractor shall produce the following Registers and forms before commencement of work, verification by the Executing Officer of the company.
  - a. Form XIII - Register of workmen employed by contractor (Rule 75).
  - b. Form XIV - Employment card issued by contractor (Rule 76).
  - c. Form XVI - Muster Roll (Rule 78 (1) (a) (i)).
  - d. Form XVII - Register of Wages (Rule 78 (1) (a) (i)).

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- e. Form XVII - Register of wages-cum Muster Roll (in case of weekly payment).
- f. Form XIX - Wage slip (Rule 78 (b)).
- g. Form XX - Register of deduction for damages or loss (Rule 78(1)(a) (ii)).
- h. Form XXI - Register for fines (Rule 78 (1) (a) (ii)).
- i. Form XXII - Register of advances (Rule 78 (1) (a) (ii)).
- j. Form XXIII - Register of overtime (Rule 78 (1) (a) (iii)).
- k. Form XXIV - Register to be sent by the contractor to licensing officer (Rule 82 ) (1).

The contractor shall maintain the above neatly, completely and legibly for inspection by various statutory authorities and the company officials even at short notice.

4. The contractor shall observe (a) Weekly rest day. (b)The company list of holidays.
5. Contractor shall obtain complete bio-data of the labour, employment certificate and Antecedent verification in the prescribed form for each labour and supervisor engaged by him and shall submit the same to the HR Department / IR section through the contract executing officers before commencement of the work.
6. The Entry permits are to be issued to the Contract Labour by CISF, based on the requisition submitted by Contract Executing Officer and forwarded by Head (HR).
7. Every contractor shall submit a notice regarding commencement and completion, of work in form - VI A&B [Rule 25 (VIII) & 81 (3)] to HR Department, IR section through his contract executing officer, for forwarding the same to State Labour Department.
8. The contractor shall make himself or his representative available at the work spot everyday during execution of work, for effective supervision.
9. The contractor shall attend to all inspections notified / conducted by the HR Department, Labour Department, P.F. authorities. Factory Inspectors ESI Inspectors or any other such authorities under the act.
10. Non - compliance of any provisions under the act/ rule/instructions / guidelines shall make the contractor liable for penal action including termination of contract.
11. Contractor shall furnish in a separate letter his place of residence and postal address. The delivery at the above named place or posting in a Post box regularly maintained by the post and telegraph Department or sending letters registered for acknowledgement of any notice, letter or other communication to the contractor. Change in address shall come into force at any time by an instrument executed by the contractor and delivered to the Company official who has signed the contract.
12. The contractor must satisfy himself by personal study and examination of the drawings/specifications furnished and understand thoroughly the scope of proposed work in detail

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and all conditions affecting the work before entering into the contract. There shall not be at any time dispute / complaint of any misunderstanding with regard to scope of work and interpretation of specifications or any misunderstanding with regard to nature or omission of the work to be done not shall any application for compensation in terms of time and money shall be accepted by company regarding the above.

13. Contractor shall in his absence keep competent agent constantly on the works and any directions or explanations given by the "Contract Signing Officer" or his representative to such agent shall be held to have been given to the contractor himself.
14. Contractor on the advice of company official shall immediately remove any person employed by him, who may in the opinion of the company official is incompetent or misbehaves or commits a deed of misconduct and such persons shall not be again employed on the works without permission of the company official.
15. The contractor shall erect and maintain at his own cost temporary weather proof sheds at such places approved by the company for keeping materials under cover.
16. The contractor shall give all notices required by the acts regulations, bye-laws, legal acts and pay all fees in connection therewith unless and otherwise arranged and decided in writing with the company. He shall also ensure that no attachments are made against materials or work forming part of or for the use of the contractor. In all such cases, contractor shall protect and indemnify the company against any claim or liability arising from or based on the violation of any such laws, ordinances, regulations, orders, decrees or attachments either by himself or by his employees,
17. It shall be contractor's sole responsibility to protect the public and his employees against accident from any cause and provide required safety equipments and shall indemnify, the company against any claims for damages for injury to the person or property resulting from any such accidents and shall, where the provisions of the workmen's compensation act apply, take steps to properly insure against any claims there under.
18. In the event of any accident in respect of which compensation may become payable under the Workmen's Compensation Act VIII of 1923 whether by the contractor or by the company as principal employer, it shall be lawful for the company to retain out of monies due and payable to the contractor such sum or sums of money as may, in the opinion of the company shall be final in regard to all matter arising in this clause.
19. No work shall be done on Sundays or on other declared holidays of the company without the written permission of the company officer incharge of the work. The contractor shall comply with the provisions of the Factories Act Rules framed there-under if the same are applicable.
20. The contractor shall keep his work place clean and safe to avoid injuries to men and damage to finished products / equipments.
21. On the occurrence of an accident, which results in the death of any of the workmen employed by the contractor or which is so serious as to be likely to result in the death of any such workmen, the contractor shall within 24 hours of the happening of such an accident intimate in writing to the company official incharge of the work.
22. The contractor shall indemnify the company against all losses or damages sustained by the company resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or dues if any and become payable by the company, as a consequence of failure, the company to give notice under the workmen's compensation act or otherwise confirm to the provisions of the said act in regard to such accident.
23. The contractor shall ensure adherence to all statutory requirements applicable to BHARAT HEAVY ELECTRICALS LIMITED, Jhansi.

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24. The contractor shall abide by all the labour laws especially Contract labour (R & A) Act, Payment of wages Act, Workmen's compensation act, Minimum wages Act, ESI Act and Provident Fund Act as amended from time to time.
25. The contractor shall comply with provident Fund Act either through PF code allotted to him or by the code provided by PF Department to work Centers in the FACTORY CIVIL OF B.H.E.L. Jhansi.
26. Notwithstanding the clause, in case of any financial loss incurred by the company on account of contravention of the Provident Fund regulations or any regulations of rule touching the same by the contractor, the contractor shall submit an undertaking to indemnify the company to the extent of the loss incurred by the company.
27. The contractor should engage only those labourers who shall be more than 18(eighteen) years of age.
28. The contractor shall not resort to sub-contracting without the prior approval of BHEL authority. If found sub- contracting at a later date, BHEL reserves the right to take whatever action it deems fit, including cancellation of the contract.
29. The contractor shall provide the required safety equipment to labours engaged by him.
30. Contractor shall issue "Employment Card" as per statute to all the labour and supervisors covered under the job work contract.
31. The contractor shall be responsible to settle any grievances of the labour deployed by him/her.
32. Whenever the term "CONTRACTOR" is used, it shall be understood to refer to the particular person, firm or corporation with whom an agreement has been made by the concerned company official for executing the work defined in the concerned agreement and for the purpose of instructions regarding compliance with contract conditions, it shall include the contractor's authorised agents, who are entrusted with the work by contractor.
33. The quantities mentioned in the agreement schedule are worked out from the relevant drawings in the company and may not be the actuals required for execution. The BOQ attached with this tender is tentative and may change after submission of the same by the consultant.
34. The company does not expressly or by implication agree that the actual amount of the work to be done shall correspond there with, but reserves the right to increase or decrease the quantity of any class or portion of the work as it deems necessary.
35. All the works shall be carried out in accordance with the directions and to the satisfaction of the company official in accordance with the drawings, specifications and instructions. Supplementing or explaining the same as may be, from time to time shall be done by the company official.
36. For all modifications, omissions or additions to the approved drawings and specifications, the company shall issue revised plans or written instructions.
37. The company shall have the privilege of ordering modifications, omissions, or additions at any time before completion of the work.
38. All materials, articles, and workmanship shall be the best of their respective kinds for the class of work described in the contract specifications and schedule and materials to be obtained by the contractor shall be from sources approved by the company.
39. Sample of materials shall be furnished by the contractor at his expense to the company when called for before execution of any work.

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40. The company shall have power to reject at any stage, any work which is considered to be defective in quality of materials of workmanship and shall not be debarred from rejecting wrong material by reasons of having previously passed them. Any portion of the work or materials rejected or pronounced to be inferior or not in accordance with specifications shall be removed from the work site at the contractor's expenses.
41. The decision of the company shall be final and binding on the contractor on all technical questions which may arise in the contract with respect to material, workmanship, removal; of improper work, interpretation of the working drawings, specifications, notes, procedures etc.
42. The decision of the "Contract Signing Officer" or any officer deputed by him duly authorised on his behalf, in respect of the rate of progress and the quality of work or material shall be final.
43. Contracts shall be deemed to have included in his tender, price of all the plants, Machinery and appliances required for the purpose of all operations connected to secure a satisfactory quality of work within the time specified.
44. If at any time, during the progress of work or any part of it such methods or equipment appear to the company official to be insufficient or inappropriate for ensuring the quality of work required or rate of progress, he may order the contractor to increase their efficiency or to improve their quality of work and the contractor shall comply with such order and on failure of which the company may take such action as it deems it fit to improve the quality of work of the company may take such action as it deems if fit to improve the quality of work or the rate of progress required from the contractor and all such actions taken by the company shall be at the cost and risk of the contractor.
45. It is open to the company to lend or supply to the contractor any tools, implement, material and machinery that are needed by the contractor, which in the opinion of the company is essential to improve the quality or progress of work. The contractor shall pay such deposit or charges that may be fixed or determined by the company for any such articles or machinery lent or hired to the contractor. See schedule "C"
46. Any electric power required for contractors' lighting/machinery for the purpose of work shall be supplied **FREE OF COST** by the company at the written request of the contractor at one point subject to the observance of rules and regulations of Electric board / company free of cost. If it is observed that power is being wasted, BHEL shall have the right to recover cost of such consumption including arrears. Power will **not** be allowed for **cooking** and **room (air) heating** in winter season: For this purpose, on written application chargeable power can be allowed. The rates shall be the rates applicable for industrial consumption in U.P.
47. The contractor shall confirm to the regulations and laws of central / state govt. or any local authority and that of the company with whose system the machinery is supposed to be connected.
48. All rubbish as it accumulates shall be removed from the site to the point of disposal as indicated from time to time by the company. If this is not adhered to, the company shall remove the scrap and recover the cost of these operations from the bills of the contractor.
49. Any sum due from the contractor on account of tools and plants, stores, or any other items provided by the company shall be deducted from the respective bill due to him.
50. In case of breach of any of the terms and conditions of the contract, a claim shall be lodged under the bank guarantee with the guarantor at the discretion of the competent authority of the company. On successful completion of the contract to the satisfaction of the company, the bank guarantee shall be released after due claim period.
51. In the event of any question or dispute or under this contract, the same shall be referred to a competent Authority in the company for sole arbitration and his decision shall be final and binding on the parties to the contract.

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52. In case of any suit or other legal proceeding arising under this contract, the courts at Jhansi (UP) only shall have the Jurisdiction.
53. The company reserves the right to enter into parallel agreement with one or more contractor(s) at its discretion.
54. Disputes, grievances between the contractor and his labour, will have to be settled by the contractor himself/herself.
55. The labour employed by the contractor, if found in betting with fellow labour or contractors or any BHEL employee, the same shall be considered as an act of indiscipline. Such labourers shall be removed from the services of the contractor, on the advice of BHEL. Further the contractor shall initiate every necessary action in accordance with the relevant Laws, Rules & Regulations and enactments of State and Central Government.
56. Wherever, BHEL/COMPANY standards are mentioned, same shall by strictly follow.
57. Nothing contained in the contract agreement and its conditions shall be deemed to preclude or render inoperative the service of any notice, letter or other communication upon the contractor personally.
58. The works have to be carried out as per CPWD specifications 2009, Wherever CPWD specifications are silent, the work shall carried out as per BIS specifications. In case of defective BHEL will have full right to reject the work or part there of .Such defective work if any , will have to be rectified at contractor's cost . The opinion of Engineer in charge shall be final in this matter. If the defective work is allowed to stand BHEL shall have the absolute right to reduce the rates for such items and the contractor shall have no claims over such defective work allowed on reduced rates.
59. All recoveries due from the contractor for the month/period shall be effected in full from corresponding running bills unless specific approval from competent authority is obtained to the contrary. The recoveries shall **be I.Tax ( 2.%) , VAT ( 4% )** of gross amount after cement and steel cost deduction- issued by BHEL , Water charges etc.
60. BHEL General Conditions of contract (G.C.C.) will also be applicable in addition to this tender document. The BHEL General Conditions of contract (G.C.C.) can be obtained from FCX office on any working day between 9:00 AM to 3:00 PM

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### PENALTY FOR DELAY IN WORK

1. The contractor fails to maintain the required progress as per contract or to complete the work and clear the site on or before the contract.  
Or extended date – period of completion, he shall, without prejudice to any other right or remedy of the company/ corporation on account of such breach, pay as agreed compensation amount calculated as stipulated below or such smaller amount as may be fixed by the authority on the contract value of the work for every week that the progress remains below that specified in condition 14 or that the work remains incomplete.

(a) Completion period (as originally stipulated) @ 1 percent per week  
Not exceeding 4 months. maximum 10 %

2. Provided always that the total amount of completion for delay to be paid under the condition shall not exceed the under-noted percentage of the contract value or of the contract value of the item or group of item of work for which a separate period of completion is given.
3. The amount of compensation may be adjusted or setoff against any sum payable to the contractor

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under this or any other contract with the company/ corporation

**62. Special Instructions for Rates :**

1. Contractor shall be deemed to have included in his tender price of all the plant, machinery and appliance required for the purpose of all operations connected with the work embraced under the contract to secure a satisfactory quality of work and rate of progress which in the opinion of the "Contract Signing Officer" will ensure the completion of the work within the time specified.
2. The contractor has to produce the bank guarantee (as mentioned earlier) in the prescribed proforma valid for the contract period for a value calculated at the rates mentioned towards security deposit. The claim period under the guarantee shall be valid for three months after expiry of the contract and the same will be kept valid by proper renewal till the satisfactory completion of the Guarantee period (12 months) + 3 months claim period. 10% of total value shall be withheld in case bank guarantee is not renewed.
3. This is a time bound contract for period mentioned, and does not envisage any escalation of price.
4. The rates quoted by the contractor shall be firm for the contract period.

**63. MAINTENANCE AND THE GUARANTEE:-**

- a. The above guarantees/shall be valid for a period of 12 (Twelve) calendar months after the date of final taking over by the Bharat Heavy Electricals Limited. During this period, the Contractor's liability shall be limited to the replacement immediately, or any of defective parts that may develop in structures or part of a civil structure of his own manufacturer those of his subcontractors under the conditions provided for by the Contract, and arising solely from structural detailing, workmanship or improper packing provided always that such defective parts as are not repairable at site, and not essential in the meantime in the use of the structure, are returned to the contractor's works unless otherwise arranged.
- b. All such rework of defective work mentioned above shall be made free of cost at site by the contractor . and shall be the contractor's responsibility and shall be made at his expenses. Bharat Heavy Electricals Limited, will, however, render such assistance in this matter as will expedite the same
- c. Until the final certificate has been issued, the Contractor shall have the right of entry, at the own risk and expense, by himself or his duly authorized representatives (whose names shall previously have been communicated in writing to the Executive Engineer) at all working hours to all necessary parts of the works, for the purpose of inspecting the structure and taking note there from, and if he so desires, making any tests at his own expense subject to the previous approval of the Engineer in charge.
- d. At the end of the maintenance period, the Contractor's liability ceases, except as regards workmanship which the Executive Engineer shall have previously given notice of the contractor to rectify.

**64. CERTIFICATE OF THE ENGINEER:**

- a. Every application to the Engineer-in charge. For his certificate for payment, must be accompanied by a detailed invoice, setting forth the claims in the same order as is found in the accepted Schedule of quantities and at the same rates. The said certificate will thereafter be issued by the Engineer-in charge at a reasonable time after receipt of the application.
- b. The Engineer-in charge may make any correction or modification in any previous certificate, which may have issued by him and payments, will be regulated and adjusted accordingly.

**65. CERTIFICATE IPSO FACTO NOT TO AFFECT THE RIGHTS OF THE BHARAT HEAVY ELECTRICALS LIMITED OR CONTRACTOR:**

No certificate of the Engineer in Charge on account, nor any sum paid on account by the Bharat Heavy Electricals Limited, Nor any extension of time for the execution of the works given to the

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT

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Contractor shall in any way affect or prejudice the rights of Bharat Heavy Electricals Limited against the contractor, or relieve the contractor of his obligation for the due performance of the Contract or be interpreted as approval of the work done or of the materials supplied and no certificate ipso facto shall create liability in Bharat Heavy Electricals Limited, to pay for alternations, amendments, variations or discharge in the liability of the contractor for the payment of damages whether due, ascertained, or certified or not, or any sum against the payment of which he is bound to identify the Bharat Heavy Electricals Limited, nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise, affect or prejudice rights of the contractor against Bharat Heavy Electricals Limited.

66. **CO-OPERATION WITH OTHER CONTRACTORS**

The contractor shall agree to co-operate with the Bharat Heavy Electricals Limited's other contractors for associated work and freely exchange all technical information with them to obtain the most efficient and economical execution and to avoid unnecessary duplication of work. No remuneration shall be payable by Bharat Heavy Electricals Limited for such technical co-operation.

The contractor shall forward to Bharat Heavy Electricals Limited copies of all correspondence and drawings so exchanged.

67. **TIME AND PROGRESS CHART AND PROGRESS REPORTS**

The contractor shall submit the Bar chart/PERT Chart before starting the work. Weekly monitoring of the project is to be carried out. Contractor has to submit the weekly progress reports and any delay should be sorted out so that project should be carried out as per Bar Chart/PERT Chart.

68. **ENGINEER'S SUPERVISION:**

All the work shall be carried out in co-operation with, and under the direction and to the reasonable satisfaction of the Engineer in Charge. The contractor shall be reasonable for the correctness of the positions, alignment and dimensions of the works according to the drawings, notwithstanding that he may have been assisted by the Engineer in setting out the same.

69. **CONSTRUCTION EQUIPMENT:**

The contractor shall provide all equipments and tools needed to do the work efficiently. Bharat Heavy Electricals Limited shall not be under any obligation to arrange for or give on hire, any construction or erection equipment.

70. **WORK AT SITE:**

a. In the execution of the work, no persons other than the contractor, or his duly appointed representatives, subcontractors and workman shall be allowed to do work at the site, except by the special permission, in writing of the Engineer in Charge and his representative and other authorized officials or representatives of **BHARAT HEAVY ELECTRICALS LIMITED**.

b- The work so far as it is carried out on Bharat Heavy Electricals Limited premises shall be carried out at such time as Bharat Heavy Electricals Limited, approved and so as not to interface unnecessarily with the conduct of Bharat Heavy Electricals Limited's business but Bharat Heavy Electricals Limited shall give the contractor all reasonable facilities for carry out the work.

71. **POSSESSION PRIOR TO COMPLETION:**

Bharat Heavy Electricals Limited shall have the right to take possession of, or use any completed or partially completed part of the work. Such possession or use shall not be deemed to be an acceptance of any work not in accordance with the contract.

72. **WITH HOLDING PAYMENT:**

B.H.E.Ltd., may withhold the whole or part of any payment for erection claimed by the contractor, which in the opinion of the B.H.E.Ltd. is necessary to protect itself from loss on account of:

c. Defective work not remedied or guarantees not met,

d. Claims filed against the Contractor.

e. Failure by the Contractor to make due payment for materials or labor employed him.

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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f. Damage to another contractor.

Then the grounds withholding payments are removed, payments of the amount due to the contractor shall however be made by B.H.E.L.

**73. LIENS:**

Final payment to the contractor shall not be made until the Contractor shall deliver to BHE LTD, a complete release of all lines arising out of the contract or receipts in full in lieu thereof and in either case, an affidavit that so far as he has knowledge or information, the releases and receipts include all the labor and material for which a lien could be filled. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to B.H.E.Ltd., all moneys that the latter may be completed to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

**ANNEXURE -A  
FINANCIAL VIABILITY**

1.	Owner's capital in the business (in case of partnership, please mention percentage shares and amounts)	Rs :
2.	Quantum of business done during last three financial years 2011-2012 2010-2011 2009-2010	Rs. Rs. Rs.
3.	Value of fixed Assets of the Business in last three years 2011-2012 2010-2011 2009-2010	Rs. Rs. Rs.
4.	Guarantee limits (if any) enjoyed by the firm	Rs.
5.	Over draft limits (if any) enjoyed by the firm	Rs.
6.	Please enclose audited profit and loss account and balance sheet for last 3 years (indicate no. of sheets)	
7.	Certificate from Scheduled Bank to prove contractor's financial capacity to undertake the work duly indicating the financial limits the tenderer enjoys	
8.	PERMANENT ACCOUNT NUMBER:	

**Note: All the above documents should be duly certified by auditors /Bank as may be applicable.**

Signature, seal & issuing authority  
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Sign, seal & date of contractor



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**ANNEXURE - `B`**

**ANALYSIS OF SIMILAR JOBS EXECUTED/IN PROGRESS**

Sl.No	Agency by whom awarded	Location of the Project	Particulars of the works awarded	Contract value	Date of completion

**ANNEXURE -C  
DECLARATION SHEET**

I, .....on behalf of M/s.....  
..... hereby certify that, all the information and data furnished by us with regard to this Tender No. **FCX / TE / 2 / 06 / R** are true and complete. We have gone through the specification, conditions and stipulations in detail and agree to comply with the requirements and intent of specifications.

We, further declare that, the rates quoted by us in price bid are unconditional and unambiguous.

Date

Name & signature of the bidder  
(Seal)

Signature, seal & issuing authority  
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Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT**

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**ANNEXURE – D  
CHECKLIST & SCHEDULE OF GENERAL PARTICULARS**

*NOTE: Tenderers are requested to fill in the following details and no column should be left blank.*

1.	<b>Name &amp; Address of the Tenderer</b>	
2.	E-mail ID	
3.	Phone No. (Office) & Fax No.	
4.	Name & designation of the official of the tenderer to whom all the references shall be made	
5.	Tenderer's proposal No. & date	
6.	Whether EMD submitted (By cash/bank draft). Give detail.	
7.	Validity of offer/rates quoted for six months from the date of opening of tender	Yes/No
8.	Financial Status as per Clause 9.1 (in the format Annexure `A')	Yes/No
9.	Permanent account Number as per Clause 9.1	
10.	Details of experience as per Clause 9.3 (in the format Annexure `B')	Yes/No
11.	Attested copy of power of attorney as per clause 9.5	Yes/No
12.	Details about type of the firm as per clause 9.6	
13.	Declaration sheet as per clause 9.7 (in the format Annexure `D')	Yes/No
14.	P.F. Code No	
15.	Service Tax Registration Number( PAN based )	
16.	ESI policy no-	
17.	Valid labour license no. & date	
18.	Blank price-bid, clause 9.2	
19.	Bar chart/PERT Chart (Time schedule)	
20.	Self Declaration that contractor has not been found guilty by a court of law in India for fraud, dishonesty or moral turpitude (format on page No.22 in tender)	
21.	Self certificate for not been blacklisted by any BHEL unit or any other organization where he has worked (format on page No.22 in tender)	
22.	Self certificate that contractor will abide by all statutory and regulatory requirements while carrying out the work. (format on page No.22 in tender)	

**ANNEXURE – “E”**

**Format for Details of tool/Plants Machinery**

S.No.	Tool/Pant/Machinery	Nos Available
1.		
2.		
3.		
4.		
5.		

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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**ANNEXURE – “ F ”**  
**Format for Details of Member**

S.No	Designation	No. of Employee
1		
2		
3		
4.		

**ANNEXURE – “ G “**  
**Format for self Declaration**

I < Name >..... in my capacity as <proprietor, lead partner, director> of  
M/S <Firm Name>.....Here by solemnly declare that M/S. <firm name>.....

1. Has never been found guilty by a court of law in Indian for any crimes of fraud, dishonesty or moral turpitude
2. Has never been black listed by any BHEL unit or any other organization.
3. Undertakes to abide by all statutory and regulatory requirements while carrying out work at BHEL Jhansi.

Signature, seal & issuing authority  
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Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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**ANNEXURE – “ H “  
CONTRACT**

**(To be issued in appropriate valid Non –Judicial stamp paper issued from  
State of Uttar Pradesh)**

THIS AGREEMENT MADE THIS..... DAY OF  
..... 200.... Between BHARAT HEAVY ELECTRICALS LIMITED, Jhansi (A  
Government of India Enterprise) a Company incorporated under the Companies Act  
1956, having its registered office at BHEL House, Siri Fort, New Delhi – 110 049  
(hereinafter called BHEL) of the ONE PART

AND

..... (hereinafter  
called the `Contractor') of the SECOND PART.

WHEREAS M/s ..... state that they have  
acquired and possess extensive experience in the field of  
..... and whereas in  
response to an Invitation to Tender No..... dated ..... issued by  
BHEL for the execution of ..... the Contractor submitted their offer  
dated..... And whereas BHEL has accepted the offer of the Contractor on  
terms and conditions specified in the Letter of Intent No..... dated.....  
Read with the reference cited therein.

THIS AGREEMENT WITNESSESS AND it is hereby agreed by and between the parties  
as follows:

That the Contractor shall execute the work of .....  
..... and more particularly described in Tender  
specification (hereinafter called the said works) in accordance with and subject to terms  
and conditions contained in these presents, Instructions to Tenderers, General  
Conditions of Contract, Special Conditions, annexures, Letter of Intent  
dated ..... and such other instructions, drawings, specifications given to him  
from time to time by BHEL.

The Contractor is required to furnish to BHEL Security Deposit in the forms of  
cash/approved securities / Bank Guarantee valid upto ..... for a sum of  
Rs..... (Rupees  
.....) towards satisfactory  
performance and completion of the Contract.

The Contractor has furnished a Guarantee bearing No..... Dated  
..... for a sum of Rs..... (Rupees.....  
.....) executed by .....Bank in favour of BHEL  
towards Security Deposit valid up to.....(The Contractor has furnished to  
BHEL an initial Security Deposit of Rs..... in cash /Approved Securities/BG for  
Rs..... And has agreed for recovery of the balance security deposit by

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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BHEL..... @ 10% of the value of work done from each running bill till the entire security deposit is recovered).

The contractor hereby agrees to extend the validity of the Bank Guarantee for such further period or periods as may be required by BHEL and if the contractor fails to obtain such extension (s) from the Bank, the contractor shall pay forthwith or accept recovery of Rs..... from the bills in one installment and the Contractor further agrees that failure to extend the validity of the Bank Guarantee or failure to pay the aforesaid amount in the manner specified above shall constitute breach of contract. In addition to above, BHEL shall be entitled to take such action as deemed fit and proper for recovering the said sum of Rs.....

That in consideration of the payments to be made to the contractor by BHEL in accordance with this Agreement the Contractor hereby convenience and undertakes with BHEL that they shall execute, construct, complete the works in conformity, in all respects, with the terms and conditions specified in this Agreement and the documents governing the same.

That the Contractor shall be deemed to have carefully examined this Agreement and the documents governing the same and also to have satisfied himself as to the nature and character of the works to be executed by him.

That the Contractor shall carry out and complete the execution of the said works to the entire satisfaction of the Engineer or such other officer authorised by BHEL, within agreed time schedule, the time of completion being the essence of the Contract.

That BHEL shall, after proper scrutiny of the bills submitted by the Contractor, pay to him during the progress of the said works such sum as determined by BHEL in accordance with this Agreement.

That this Agreement shall be deemed to have come into force from the date on which the letter of intent has been issued to the Contractor.

That whenever under this contract or otherwise, any sum of money shall be recoverable from a payable by the Contractor, the same may be deducted in the manner as set out in the General Conditions of Contract or other conditions governing this Agreement.

That all charges on account of Octroi, Terminal and other Taxes including sales tax or other duties on material obtained for execution of the said works shall be borne and paid by the Contractor.

That BHEL shall be entitled to deduct from the Contractor's running bills or otherwise Income Tax under Section 194(C) of the Income Tax Act, 1961.

That BHEL shall be further entitled to recover from the running bills of the contractor or otherwise such sum as may be determined by BHEL from time to time in respect of consumables supplied by BHEL, hire charges for tools and plants issued (where applicable) and any other dues owed by the contractor.

That it is hereby agreed by and between the parties that non-exercise, forbearance or omission of any of the powers conferred on BHEL and/or any of its authorities will not in any manner constitute waiver of the conditions here to contained in these presents and the liability of the Contractor with respect to compensation payable to BHEL or Contractor's obligations shall remain unaffected.

It is clearly understood by the between the parties that in the event of any conflict between the Letter of Intent and other documents governing this Agreement, the provisions in the letter of intent shall prevail.

The following documents:-

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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(a) Invitation to Tender No..... and the documents specified therein

(b) Contractor's Offer No..... date.....

(c) Letter of Intent No..... date .....

(d) .....

shall also form part of & shall govern this Agreement.

IN WITNESS HEREOF, the parties hereto have respectively set their signature in the presence of:

(CONTRACTOR)

to be signed by a person holding a valid Power of Attorney

WITNESS: -1. ....

2. ....

WITNESS: - For and on behalf of Bharat Heavy Electricals Ltd, Jhansi

1. ....

2. ....

**ANNEXURE – “ I “**

**BANK GUARANTEE**

**MODEL FORM OF BANK GUARANTEE (FOR SECURITY DEPOSIT)  
(To be issued in appropriate valid non-judicial stamp paper  
issued from State of Uttar Pradesh)**

In consideration of the Bharat Heavy Electricals Limited, having its registered Office at BHEL House, Siri Fort, New Delhi (hereinafter called BHEL), having agreed to exempt ..... (hereinafter called "the said Contractor (s)" from the demand, under the terms and conditions of the Agreement dated ..... made between BHEL and ..... for ..... (hereinafter called "the said Agreement") of Security (name of work) deposit for the due fulfillment by the said contractor(s) of the terms and conditions contained in the said Agreement, on production of a bank guarantee for Rs..... (Rupees .....Only) We .....

(indicate the name of the Bank) at the (hereinafter referred to as "the bank") request of contractor(s) do hereby undertake to pay to BHEL and amount not exceeding Rs..... against any loss or damage caused to or suffered or would be caused to or suffered by BHEL, by reason of any breach by the said contractor(s), of any of the terms or conditions contained in the said Agreement.

We, ..... do hereby undertake to pay the amounts due

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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(indicate the name of the Bank) and payable under this guarantee without any demur, merely on a demand from BHEL, stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by BHEL by reason of breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement or by reason of the contractor(s)'s failure to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.....

3. We, ..... undertake to pay to BHEL any money so

(indicate the name of the Bank) demanded notwithstanding any dispute or disputes raised by the Contractor(s) / supplier(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under these presents being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s) / supplier(s) shall have no claim against us for making such payment.

We ..... further agree that the guarantee herein (indicate the name of the Bank) contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of BHEL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till BHEL certifies 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. Unless a demand or claim under this guarantee is made on us in writing on or before ..... we shall be discharged from all liability under this guarantee thereafter.

We ..... further agree with BHEL that BHEL shall have (indicate the name of the Bank) the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time 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 the BHEL against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of BHEL or any indulgence by BHEL to the said Contractor(s) or by any such matter or thing whatsoever which under the Law relating to sureties would, but for this provision, have effect of so relieving us.

This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s) / Supplier(s).

We, ..... lastly undertake not to revoke this guarantee (indicate the name of the Bank) during its currency except with the previous consent of BHEL in writing.

Dated ..... Day..... of 200

For .....  
(indicate the name of the Bank)

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT

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Witness :

1. -----

2. -----

**Note :** The above format is drawn upon the model form jointly evolved by the Reserve Bank of India, the Indian Banker's Association and the Ministry of Finance, Government of India as circulated by Indian Banker's Association, Bombay vide their letter No. LA/14-61/7808 dated 1/5/1980 as such no deviations are acceptable.

To be issued in appropriate valid non-judicial stamp paper prevalent in the state where the same is executed which is to be certified by the Notary Public or any other competent officer of that state.

**(TO BE ISSUED IN NON-JUDICIAL STAMP PAPER OF Rs. 100/- issued from State of Uttar Pradesh)**

**ROAD WORK SPECIFICATION**

**1.0 Terminology**

**Asphalt:** A natural or artificial mixture in which bitumen is associated with mineral matter. The word 'Asphalt' should always be qualified by indication of its origin or nature.

**Asphalt Mastic:** An intimate mixture of mineral fillers, well graded sand and / or stone chippings with a hard grade of bitumen, cooked and laid hot manually by means of wooden float. The mixture settles to a coherent, voidless and impermeable solid or semi-solid mass under normal temperature condition.

**Bitumen:** A noncrystalline solid or viscous material, having adhesive properties derived from petroleum either by natural or refinery processes and substantially soluble in carbon disulphide.

**Bitumen-Cutback:** Bitumen, the viscosity of which has been reduced by a volatile diluent when blended with kerosene or naphtha type diluent or fuel oil, is called, medium or rapid or slow curing cut backs respectively.

**Bitumen-Emulsion:** A liquid product in which a substantial amount of bitumen is suspended in a finely divided condition in an aqueous medium containing an emulsifier and stabiliser. The emulsion is termed 'Anionic' when the bitumen particles are negatively charged and the aqueous phase is alkaline. The emulsion is termed 'cationic' when the particles are positively charged and the aqueous phase is acidic.

**Bitumen Mastic:**

Filler: Inorganic mineral material all of which will pass through specified IS: sieve used in admixture with solid or semi-solid bituminous material.

Road Tar: A product obtained by treating at high temperature coal tar in such a manner that it conforms to a specification which defines its suitability for road construction.

Tar: A viscous material having adhesive properties and resulting from the distinctive distillation of certain type of organic material. The term Tar should be preceded by the name of the material from which it is produced e.g. coal, shale, peat, vegetable matter and its mode of production shall be indicated.

Flash Point: The lowest temperature at which the vapour of a substance can be ignited in air by a flame under specified conditions of test. The substance itself does not continue to burn.

Tack Coat: It shall consist of application of a single coat of low viscosity liquid bituminous material to an existing road surface preparatory to further bituminous construction.

**1.1 Materials**

**1.1.1 Aggregate Coarse**

Coarse aggregate as specified in the item shall be either crushed / broken stone, hard blue granite or one of the naturally occurring aggregates such as kankar or laterite of suitable quality as stated hereinafter and approved by the Engineer-in-charge.

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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The stone aggregate shall conform to the physical requirements set forth in Table 1.1. The type and size range of the aggregate shall be specified in the contract.

**TABLE 1.1  
PHYSICAL REQUIREMENTS OF COARSE AGGREGATE**

Sl.No.	Type of Constn.	Test of W.B.M.	Test method	Requirements
1.	Sub-base	Los Angeles Abrasion value or Aggregate impact value	IS: 2386 (Pt.IV) IS: 2386 (Pt.IV) IS: 5640***	60% max. *50% max.
2.	Base	(a) Los Angles Abrasion value of aggregate impact value (b)	IS 2386 (Pt. IV) IS 2336 (Pt. IV) IS 5640*** IS 2386 F (1)	50% max. *40% max. ** 15% max.
3.	Surface Course	(a) Los Angles Abrasion value or Aggregate impact value (b) Flakiness Index	IS 2386 (Pt. IV) IS 2386 (Pt. IV) IS 2386 F (1)	40% max. 30% max.

The coarse aggregate shall conform to one of the gradings given in Table 1.2 as specified. For crushable type of aggregates such as kankar and laterite, hard blue granite grading shall not be regarded as very important, but the materials should generally be within the specified range.

**TABLE 1.2  
GRADING REQUIREMENTS OF COARSE AGGREGATE FOR W.B.M.**

Grading No.	Size Range	Sieve designation	% by weight passing the sieve
1.	90mm to 45mm (suitable for sub base courses of compacted layer of not less than 90mm thickness)	125mm	100
		90mm	90 – 100
		63mm	25 – 60
		45mm	0 – 15
		22.4mm	0 - 5
2.	63mm to 45mm	90mm	100
		63mm	90 – 100
		53mm	25 – 75
		45mm	0 – 15
		22.4mm	0 – 5
3	53mm to 22.4mm	63mm	100
		53mm	95 – 100
		45mm	65 – 90
		22.4mm	0 – 10
		11.2mm	0 - 5

1.1.1.1 Crushed or Broken Stone: When crushed or broken stone is specified as the coarse aggregate, it shall be hard, durable and free from excess of flat, elongated, soft, disintegrated particles, dirt and other objectionable matter. The total quantity of such deleterious material including clay lumps, soft fragment, foreign material etc., shall not exceed 5% of the weight of the aggregate.

1.1.1.2 Kankar: Kankar shall be tough, having a blue almost opalescent fracture. It shall not contain any clay in the cavities between nodules.

1.1.1.3 Laterite: Laterite shall be hard, compact, heavy and of dark colour. The light coloured sandy laterite as well as those containing much ochreous clay shall be rejected.

The sum of the percentages of all deleterious material shall not exceed 5%. Tests for estimation of deleterious materials and organic impurities shall be done as per IS : 2386 (Pt.II).

**1.1.3 Binding Material**

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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Binding materials to prevent ravelling of water bound macadam construction shall consist of a fine grained material possessing plasticity index value of 4 to 9 when the water bound macadam is to be used as a wearing course, and 4 to 6 when W.B.M. is being adopted as a sub-base/base course with bituminous surfacing on top of it. The plasticity index shall be determined in accordance with IS:2720 (Pt.V). The quantity of binding material used in each layer shall be as per direction of the Engineer-in-charge, where screening consisting of crushable type material like morrum or gravel are used. Where earth cut for sub-grade formation is used as binder with the approval of Engineer-in-charge, no separate payment shall be made for collection of this binder material.

**1.1.4 Bitumen Straight run**

A range of grades, from a very soft to a very hard consistency, can be produced by varying the temperature and the rate of flow during distilling process. It shall conform to IS:73. Grades of bitumen for different uses is given in Table 1.3

**TABLE 1.3  
BITUMEN GRADES**

**Note:** For premix carpeting with paving asphalt, extra shall be paid if solvent is used.

	Grade	Temperature to which it shall be heated
I	FOR PAINTING (Surface Dressing)	
1	Paving bitumen from Assam Petroleum A 90	177 deg. C to 190 deg. C
2	Paving bitumen from other sources 80/100 – S90	177 deg. C to 190 deg. C
3	Bitumen Emulsion min. 50% bitumen content: RS grade IS:8837	(Cold application)
4	Cut backs RC-3 (rapid curing) IS:217	-do-
II	FOR PREMIX CARPETING	
1	Paving Asphalt 30/40 s-35 OR 80/100 S-90	149 deg C to 177 deg. C
2	Bitumen Emulsion min. 60% bitumen contents RS grade IS:8837	(Cold application)
3	Cut back MC (medium curing) IS:4545	(Cold application)
III	FOR ASPHALTIC CONCRETE STRAIGHT RUN BITUMEN 60/70 (S-65) CONFIRMING TO IS : 73	150 deg. C to 177 deg. C

**Note:** For premix carpeting with paving asphalt, extra shall be paid if solvent is used.

**1.1.5 Filler**

The filler, where specified, shall be an inert material, the whole of which passes through a 710 micron sieve, atleast 90 percent passing through a 180 micron sieve and not less than 70 percent passing through a 90 micron sieve. The filler shall be cement, stone dust, hydrated lime, lime stone dust, fly ash or any other non-plastic mineral matter approved by the Engineer-in-charge.

**TABLE 1.4  
AGGREGATE GRADATION INCLUDING FILLER**

. Sieve designation	Percent by weight passing the sieve	
	For 25mm thickness	For 20mm thickness
20.0 mm	100	--
12.5mm	75 -100	100
10.0mm	60 - 85	75 - 100
4.75mm	35 - 55	35 - 55
2.36mm	20 - 35	20 - 35
600 micron	10 - 22	10 - 22
300 micron	6 - 16	6 - 16
150 micron	4 - 12	4 - 12
75 micron	2 - 8	2 – 8

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Flyash shall conform to IS 3812 (Pt.III)

**1.1.7 Lime**

1.1.7.1 Lime used shall conform to IS:712-1984 Building limes are classified as follows:

Class A : Eminently hydraulic lime used for structural purposes.

Class B : Semi hydraulic lime used for masonry mortars.

Class C : Fat Lime used for finishing coat in plastering, white washing etc., and addition of Pozzolanic material for Masonry Mortar.

Class D : Magnesium lime used for finishing coat in plastering, white washing etc.

Class E : Kankar lime used for masonry mortars.

1.1.7.2 Quick Lime: Quick Lime shall be supplied in the form of lumps and not in powder. Soon after delivery, lump lime shall be separate from powder and all underburnt/overburnt lumps and the powder removed. Quick lime shall not be used directly in the work and shall invariably be slaked and converted to lime putty before use.

1.1.7.3 Hydrated Lime: Hydrated lime shall be in the form of a fine dry powder. It shall be supplied in suitable containers such as jute bags lined with water proofing membrane. The bags shall bear marking indicating the class of lime, net weight, date of manufacture and the brand name. It shall be used within 4 months of its date of manufacture.

1.1.7.4 Storage: Lime shall be stored in weather proof sheds. Hydrated lime shall be stored in the same manner as cement. Lime which has been damaged by moisture or air-slaking shall not be used. All damaged and rejected lime shall be removed from the site of work forthwith.

1.1.7.5 Testing: Chemical and physical requirements of building limes are as per Physical and chemical requirements specified in CPWD Specification Vol.I. Laboratory tests shall be carried out to check the quality of lime to be used.

**1.1.8 Moorum**

It shall be obtained from pits of weathered disintegrated rocks. It should preferably contain silicious material and natural mixture of clay of calcarious origin. The size of moorum shall not be more than 20mm.

**1.1.9 Soil**

Soil having a plasticity index (PI) between 5 and 20 shall be suitable. Atleast one test for 200 cubic metre of soil for determining P.I. shall be conducted.

**1.1.10 Stones**

These shall be clean, hard, sound and durable stones, free from decay and weathering, They shall be in blocks and hammer dressed on all sides. The size of pitching stones shall be approximately 22.5 cm in depth and not less than 15cm in any other direction.

**1.1.11 Stone Chipping for Surface Dressing/Painting**

The stone chipping shall consist of fairly cubical fragment of clean, hard, tough and durable rock of uniform quality throughout. These shall be obtained by crushing stone river gravel (shingle) or other approved materials. Rounded gravel shall be used only if specifically permitted by the Engineer-in-charge. The chipping shall be free of elongated or flaky pieces, soft or disintegrated stone, salt, alkali, vegetable matter, dust and adherent coatings. They shall conform to the quality requirements of Table 1.5.

However, the total quantity of such deleterious material including clay lumps, soft fragments, foreign material shall not exceed 5% of the weight of the aggregate.

The aggregate shall be got tested to ensure the requirements specified in Table 1.5.

**TABLE 1.5  
PHYSICAL REQUIREMENTS OF AGGREGATES FOR SURFACE DRESSING / ASPHALTIC  
CONCRETE**

Sl.No.	Test	Test method	Requirements
1.	Los Angeles Abrasion Value	IS:2386 (Pt.IV)	40% max
2.	Aggregate Impact Value*	IS:2386 (Pt.IV)	30% max
3.	Flakiness Index	IS:2386 (Pt.I)	25% max
4.	Stripping Value	Vide method given in appendix	25% max

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5.	Water Absorption	IS:2386 (Pt.III)	1% max
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\* Aggregates may satisfy requirements of either of the two tests.

## 1.2 Supplying and Stacking of Materials

### 1.2.1 Aggregates / Red Bajri

1.2.1.0 The item of work shall specify stone aggregate / Red bajri, as the case may be.

1.2.1.1 Stacking : Ground where stacks are proposed to be made shall be cleared, leveled or dressed to a uniform slope and all lumps, depressions etc., shall be removed. The rate stacked metal shall be free from vegetation and other foreign matter. Coarse aggregates stack shall be made at places as directed

by the Engineer-in-charge. All rejected stone metal shall be removed from the site.

The aggregates shall be stacked in convenient units of one metre top width, 2.2m bottom width, .60cm height and of length in multiples of 3m for new roads. Where berm width is limited or for repair works it shall be stacked in units of 40cm top width 1.4m bottom width, 50cm height and length in multiples of 3m. Template of steel shall be used for making the stacks and shall always be kept at site for check measurements. The Engineer-in-charge may permit stacking in different sizes and height ranging between 45 to 75cm for new roads and 40 to 60cm for repair work, in case the site conditions so demand, in a particular reach of road as decided by the Engineer-in-charge, the quantity of stacked material shall be comparable to the theoretical quantity required for W.B.M. to be laid in the reach.

The stacks shall be uniformly distributed along the roads and shall be numbered serially. The number plate shall be planted on each stack, which shall remain in position until the stack is used in the work. A register showing daily consumption of stacks shall be maintained at site of work. The collection of stone metal shall be for completed length of one km (for each layer of W.B. Macadam) or as directed by the Engineer-in-charge in writing,

1.2.1.2 Measurements: Length, breadth and height shall be measured correct to a cm. The total quantity so arrived shall be reduced by 7.5% to arrive at the net quantity for payment, in case of aggregates. NO such reduction shall be made in case of fine aggregate i.e. Red bajri & screening etc., as defined under Clause 1.1.2

### 1.2.2 Binder

1.2.2.1 Stacking: Specified binder shall be brought to the site of work in the sealed original containers. Binder brought in damaged containers shall not be allowed. The material shall be stacked in fenced enclosures, as directed by the Engineer-in-charge, on one side of the roadway. The material shall be purchased from reputed firms or their authorised dealer. All the drums brought to site shall be serially numbered and used in the same order. The materials shall be brought in at a time in adequate quantities to suffice for the whole work or for atleast a fortnight's work.

For major bituminous road works, supply of bitumen in bulk may be taken for economical reasons, or if the contingencies of the work so require. Sufficient storage arrangement shall be made at site for atleast ten days requirement.

Materials shall be kept in the joint custody of the contractor and the representative of the Engineer-in-charge. The empty containers shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the Engineer-in-charge. A few drums may be removed before completion of work for heating bitumen and mixing aggregate etc., with the permission to the Engineer-in-charge.

1.2.2.2 Measurement: The materials shall be recorded as per standard weights of different type of container as intimated by manufacturers. The material shall be weighed where containers are found leaking.

### 1.2.3 Moorum / Stone Chipping:

1.2.3.0 The item of work shall specify moorum / stone chipping, as the case may be.

1.2.3.1 Stacking: Ground where stacks are proposed to be made, shall be dressed to a uniform slope and all lumps, depressions etc., shall be removed. Sample of moorum shall be got approved from the Engineer-in-charge, before the material in bulk is brought to site.

Moorum shall be stacked in convenient units of one cubic metre in between aggregate stacks in each length of 100m as per requirement. The stacks shall be made with wooden boxes open at both ends and of 2 x 2 x 0.25m dimensions. These shall always be kept at site for stacking and check measurement.

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The stacks shall be uniformly distributed along the road. The supply of moorum shall be completed for the entire work or for a complete length of one km as directed by the Engineer-in-charge in writing.

**1.2.3.2 Measurements:** Length and breadth of boxes shall be measured correct to a cm. Volume shall be calculated in cubic metres, correct to two places of decimal.

**1.3 Water Bound Macadam with Stone Aggregate (of size 90mm to 45mm)**

**1.3.1 Quantities of Materials:** Quantities of coarse aggregate, screening and binding material required to be stacked for 100mm approximate compacted thickness of W.B.M. sub-base course for 10 Sq.m. shall be Tab 1.6.

**TABLE 1.6**

Note:- Net

Coarse Aggregate			Stone screening		Binding Material
Classification	Size range	Net Quantities	Grading / Classification and size		Quantity
Grading I	90mm to 45mm	1.21 Cum to 1.28 Cum	Type A	0.27 Cum to 0.30 Cum	0.08 Cum to 0.10 Cum

**Note:-** Net quantity = Loose quantity measured in stacks minus 7.5%.

**1.3.2 Preparation of Foundation:** In the case of an existing unsurfaced road, where new material is to be laid, the surface shall be scarified and reshaped to the required grade, camber and shape as necessary. Weak places shall be strengthened, corrugations removed and depressions and pot holes made good with suitable materials, before spreading the aggregate for W.B.M.

Where the existing surface over which the sub base of W.B.M. is to be laid is black topped, to ensure effective internal drainage, furrows 50mm x 50mm (depth of furrows increased to reach bottom of bituminous layer where necessary) at one metre intervals shall be cut in the existing bituminous surface at 45 degree C to the central line of the carriage way before the W.B.M. is laid.

**1.3.3 Provision of lateral confinement of aggregates:** Before starting with W.B.M. construction, necessary arrangements shall be made for lateral confinement of aggregates. One method is to construct side shoulders in advance to a compacted layer of the W.B.M coarse. Inside edges may be trimmed vertical and the included area cleaned off all spilled materials thereby setting the stage for spreading the coarse aggregate.

The practice of laying W.B.M. after excavating a trench section in the finished formation must be completely avoided.

**1.3.4 Spreading Aggregate:** The coarse aggregate shall be spread uniformly and evenly upon the prepared base in required quantities with a twisting motion to avoid segregation. 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 base be permitted. The aggregates shall be spread uniformly to proper profile by using templates placed across the road six metres apart. Where specified, approved mechanical devices may be used to spread the aggregates uniformly. The levels along the longitudinal direction upto which the metal shall be laid, shall be first obtained at site to the satisfaction of Engineer-in-charge, and these shall be adhered to.

The surface of the aggregate spread shall be carefully trued up and all high or low spots remedied by removing or adding aggregates as may be required.

The W.B.M. sub-base shall be normally constructed in layer of 100mm compacted thickness. No segregation of large or fine particles shall be allowed and the coarse aggregate as spread shall be of uniform gradation with no pockets of fine material.

The coarse aggregate shall normally not be spread in lengths exceeding three days average work ahead of the rolling and blending of the proceeding section.

**1.3.5 Rolling:** Immediately following at spreading of the coarse aggregate, it shall be compacted to the full width by rolling with either the three-wheel-power-roller of 8 to 10 tonnes capacity or an equivalent vibratory roller. Initially, light rolling is to be done, which shall be discontinued when the aggregate is partially compacted with sufficient void space in them to permit application of screenings.

The rolling shall begin from the edges with the roller running forward and backward and adding the screenings simultaneously until the edges have been firmly compacted. The roller shall then progress gradually from the edges to the centre, parallel to the centre line of the road and overlapping uniformly

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each preceding rear wheel track by one half width and shall continue until the entire area of the course has been rolled by the rear wheel. Rolling shall continue until the road metal is thoroughly keyed with no creeping of metal ahead of the roller. Only slight sprinkling of water may be done during rolling, if required. On super elevated curves, the rolling shall proceed from the lower edge and progress gradually continuing towards the upper edge of the pavement.

Rolling shall not be done when the sub-grade is soft or yielding or when the rolling causes a wave like motion in the sub-base or sub-grade. When rolling develops irregularities that exceed 12mm when tested with a three metre straight edge, the irregular surface shall be loosened and then aggregate added to or removed from it as required and the area rolled until it gives a uniform surface conforming to the desired cross-section and grade. The surface shall also be checked transversely by template for camber and any irregularities corrected in the manner described above. In no case shall the use of screenings to make up depressions be permitted.

**1.3.6 Application of Screenings:** After the coarse aggregate has been lightly rolled to the required true surface, screenings shall be applied gradually over the surface to completely fill the interstices. Dry rolling shall be continued while the screenings are being spread so that the jarring effect of the roller causes them to settle into the voids of the coarse aggregates. The screenings shall not be dumped in piles on the coarse aggregate but shall be spread uniformly in successive thin layers either by the spreading motion of the hand, shovels or a mechanical spreader.

The screenings shall be applied at a slow rate (in three or more applications) so as to ensure filling of all voids. Rolling and brooming shall continue with the spreading of the screenings. Either mechanical brooms or hand brooms or both may be used. In no case shall the screenings be applied, so fast and thick as to form cakes, ridges on the surface making the filling of voids difficult, or to prevent the direct bearing of the roller on the coarse aggregates. The spreading, rolling and brooming of screenings shall be performed on sections which can be completed within one day's operation and shall continue until no more screenings can be forced into the voids of the coarse aggregate. Damp and wet screenings shall not be used under any circumstances.

**1.3.7 Sprinkling and Grouting:** After spreading the screening and rolling the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screening into the voids and to distribute them evenly. The sprinkling, sweeping and rolling operations shall be continued and additional screenings applied where necessary until the coarse aggregate are well bonded and firmly set for the entire depth and until a grout has been formed of screenings and water that will fill all voids and form a wave of grout ahead of the wheels of the roller. The quantity of water to be used during the construction shall not be excessive so as to cause damage to the sub-base or sub-grade.

**1.3.8 Application of Binding Material:** After the application of screenings and rolling, a suitable binding material shall be applied at a uniform and slow rate in two or more successive thin layers. After each application of binding material, the surface shall be copiously sprinkled with water and the resulting slurry swept in with hand brooms or mechanical brooms or both so as to fill the voids properly.

The surface shall then be rolled by a 8 – 10 tonne roller, water being applied to the wheels in order to wash down the binding material that may get stuck to the wheels. The spreading of binding material, sprinkling of water, sweeping with brooms and rolling shall continue until the slurry that is formed will, after filling the voids form a wave ahead of wheels of the moving roller.

**1.3.9 Setting and Drying:** After final compaction of the course, the road shall be allowed to cure overnight. Next morning defective spots shall be filled with screenings or binding material. Lightly sprinkled with water, if necessary and rolled. No traffic shall be allowed till the macadam sets.

**1.3.10 Surface Evenness:** The surface evenness of completed W,B,M, sub-base in the longitudinal and transverse directions shall be as specified in Table 1.7.

**Table 1.7**

Size of coarse aggregate	Longitudinal profile measured with a 3m straight edge			Cross Profile
	Maximum permissible	Max. Undulations permitted 300m	No. in any length	of

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		exceeding		
		12mm	10mm	
90-45mm	15mm	30	--	12mm

The longitudinal profile shall be checked using 3m long straight edge and graduated wedge at the middle of each traffic lane along a line parallel to the centre line of the road. The transverse profile shall be checked with adjustable template at intervals of 10metres.

**1.3.11 Rectification of Defective Construction:** Where the surface irregularity of the W.B.M. sub-base course exceeds the tolerances specified in Table 1.7 or where the course is otherwise defective due to sub grade soil mixing with the aggregates, the layer to its full thickness shall be scarified over the attached area, reshaped with added material or removal and replaced with fresh materials as applicable, and recomputed. The area treated in the aforesaid manner shall not be less than 10 Sq.m. In no case shall depressions be filled up with screenings and binding materials.

**1.3.12 Measurement:** The length and breadth shall be taken to the nearest centimeter. The depth of consolidated layer shall be computed to nearest half centimeter by taking average of depths at the centre and at 30cm from the left and right edges at a cross section taken at 100 metre interval or less as decided by the Engineer-in-charge by making small pits. The consolidated cubical contents calculated in cubic metres correct to two places of decimal. The cubical contents for each 100 metre length should be compared with the volume of aggregate collected less 7.5% .

**1.4 Bases**

**1.4.0** The base course may consist of any one of the following (of size 63mm – 45mm or 53mm – 22.4 mm)

(a) Water Bound Macadam with Stone Aggregate: The stone aggregate of size 63mm to 45mm or 53mm to 22.4mm as specified shall be used. This is standard type of base course used in road work. In important roads such as national Highways and City Roads, this may form the lower part of the base course overlaid by a bitumen bound base.

(b) Water Bound Macadam Surfacing / Wearing Course with Stone Aggregate: Water Bound Macadam when laid as a surfacing / wearing course needs timely and constant maintenance. This will include patching pot holes, removal of ruts and blinding of surface with blinding material. This course is generally used only in roads of temporary nature.

**1.4.1 Water Bound Macadam (Base or Surfacing course)**

**1.4.1.1** Quantities of Materials: (Quantities of coarse aggregates and screenings required to be stacked for 75mm (approximate) compacted thickness of W.B.M. base courses for 10 Sq.m. shall be as specified in Table 1.8

**Table 1.8**

Coarse Aggregate			Stone screening		
Classification	Size range	Net Quantity	Gradings/ classification & size	For W.B.M. base course	For W.B.M. surface course
Grading 2	63-45mm	0.91 cum to 0.96 cum	Type A 13.2mm	0.12 cum to 0.15 cum	0.10 cum to 0.12 cum
Do	63-45mm	0.91 cum to 0.96 cum	Type B 11.2mm	0.20 cum to 0.22 cum	0.16 cum to 0.18 cum
Grading 3	53-22.4mm	0.91 cum to 0.96 cum	Type B 11.2mm	0.18 cum to 0.21 cum	0.14 cum to 0.17 cum

The quantity of binding material required for 75mm (approximate) compacted thickness will be 0.09 cum / 10 sqm in the case of W.B.M. base course and 0.13 cum / 10 sqm when the W.B.M. is to function as a surface course.

\* Net quantity means: The quantity of metal measured in stacks and reduced by 7.5%

**1.4.1.2** Preparation of foundation: Shall be specified in 1.3.2.

**1.4.1.3** Spreading coarse aggregate shall be as specified in 1.3.4 except that the W.B.M. base course shall be normally constructed in layers of not more than 75mm compacted thickness.

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**1.4.1.4** Rolling: Application of Screening, Sprinkling and grouting and application of blending material shall be as specified under 1.3.5 to 1.3.8.

**1.4.1.5** Setting and Drying: After final compaction of the course, the road shall be allowed to cure overnight. The next morning, defective spots shall be filled with screenings or binding material, lightly sprinkled with water, if necessary and rolled. No traffic shall be allowed till the macadam sets.

**1.4.1.6** Surface Evenness: The surface evenness of completed W.B.M. courses in the longitudinal and transverse directions shall be within the tolerance specified in Table 1.9.

**TABLE 1.9**

Size of coarse aggregate	Longitudinal profile measured with a 3m straight edge			Cross Profile
	Maximum permissible	No. of Undulations permitted in any length exceeding		Max. permissible undulation when measured with a camber template
		12mm	10mm	
63-45mm and 53 - 22.4 mm	12mm	--	30	8mm

The longitudinal profile shall be checked with a three metre long straight edge and graduated wedge at the middle of each traffic lane along a line parallel to the centre line of the road. The transverse profile shall be checked with adjustable templates at intervals of 10 metres

**1.5 Surface Course**

**1.5.0** The main functions of surface course are :

- To provide a dust free wearing course over base course such as water-bound macadam, or bitumen macadam.
- To provide water-proof surface.
- To protect water-bound macadam by preventing removal of binder between aggregate pieces.
- To prevent disintegration of an old bitumen surface.
- To provide a non-skid riding surface. This type of treatment is normally done for roads with medium density, rubber tyred traffic.

The surface course may consist of any one of the following:

- Surface dressing using hot bitumen Two coats
- Surface dressing on new surface with hot bitumen One coat
- Surface dressing on old surface with hot bitumen One coat
- Surface dressing on new surface with bitumen emulsion One coat
- Surface dressing on old surface with bitumen emulsion One coat
- Premix carpet with hot bitumen
- Premix carpet with bitumen emulsion
- Bituminous Macadam using hot-mix plant and paver equipment

**1.5.1 Surface Dressing using Hot Bitumen – Two Coats**

**1.5.1.0** This consists of the application of two coats of surface dressing each coat consisting of a layer of bituminous binder sprayed on a base prepared previously, followed by a cover of stone chippings properly rolled to form a wearing course. The existing water-bound macadam, kankar or gravel surface shall be rolled to form a wearing course. The existing water-bound macadam, kankar or gravel surface shall be cleaned thoroughly before application of bituminous binder. The work shall be carried out only when the atmospheric temperature in shade is 16 deg. C or above. No bituminous material shall normally be applied when the road surface or materials is damp, when the weather is foggy or rainy, or during dust storms.

**1.5.1.1** Materials: Binder shall be as specified and shall conform to Table 1.10 and stone chippings shall conform to grading as the Table 1.10. Unless otherwise specified or directed by the Engineer-in-charge the quantities of materials shall be as specified in Table 1.10. A proper record will be kept to ensure that the daily out-turn of work is co-related with the quantity of bitumen used.

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**TABLE 1.10**

Stone Chipping			Bitumen Quantity	
Nominal Size		Specification	Quantity	
First coat	13.2mm	100 percent passing through IS:22.4mm square mesh and retained on IS: 11.2mm square mesh	1.5 cum/ 100 sqm	1.8 kgm per sqm
Second coat	11.2mm	100 percent passing through 13.2mm square mesh and retained on 5.6mm square mesh	1.0 cum/ 100 sqm	1.1 kgm per sqm

**1.5.1.2 First Coat:**

**(a) Preparation of Surface:**

Repairs: Pot holes or patches and ruts in the water bound macadam base or surface course which is to be surface treated, shall be repaired by removal of all loose and defective material by cutting in rectangular patches and replacement with suitable materials.

For the purpose of repairs the area of pot holes shall be taken upto 0.75 sqm and depth upto 5cm. All pot holes, patches and ruts upto 2.5cm deep shall be repaired and brought to level with premix as specified in 1.5.7 and properly consolidated while those of depths greater than 2.5cm shall be repaired with similar specifications as adopted originally.

Cleaning: Prior to the application of the binder, all dust, dirt, caked mud, animal dung, loose and foreign material etc., shall be removed 30cm on either side, beyond the full width to be treated, by means of mechanical sweepers and blowers, if available or otherwise with wire brushes, small picks, brooms etc. The material so removed shall be disposed off as directed by the Engineer-in-charge.

For a water bound macadam surface, the interstices between the road metal shall be exposed upto a depth of about 10mm by means of wire brushes. The surface shall then be brushed with soft brooms to remove all loose aggregate. Finally the traces of fine dust which get accumulated while brushing shall be thoroughly removed from the surface by blowing with gunny bags. The prepared surface shall be closed to traffic and maintained fully clean till the binder is applied.

**(b) Applying Binder (hot bitumen)**

The binder shall be heated in a boiler to a temperature as specified under 1.1.4 for the grade used and maintained at the temperature, the use of a thermometer being essential.

The binder shall be applied evenly to the clean dry surface by means of a pressure sprayer at the rate specified. The binder shall be applied longitudinally along the length of the road and never across it. The edges of the binder surface shall be defined by wire or a rope stretched in position.

Heating in cut out drums and pouring from perforated tins, cans and such other methods shall not be permitted. Except in the case of petty works and repairs with the specific approval of the Engineer-in-charge.

Excessive deposits of binder cause by stopping or starting of the sprayer or through leakage or any other reason shall be suitably corrected before the stone chippings are spread.

**(c) Blinding or Spreading Stone Chippings**

Immediately after the binder is applied and while it is still hot, stone chippings free from dust and in a dry and clean state shall be spread evenly over the surface at the rate specified above. Spreading shall be done preferably by means of a mechanical gritter, otherwise manually with a twisting motion to avoid segregation which otherwise shall have to be removed by brushing the excess stone chippings over the surface into hungry spots to obtain a uniform surface, free from waviness, depressions and other irregularities. The surface shall be checked by means of a camber board laid across the road and a three metre straight edge laid parallel to the centre line of the road, and undulations if any shall be corrected by addition or removal of blindage till a surface free from undulation is obtained.

If a uniform surface is assured at this stage the completed surface should be normally free from undulations and unevenness.

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**(d) Consolidation of Blindage**

Immediately following the application of the stone chipping and light brooming, the road surface shall be compacted by a power roller of 6 to 8 tonnes, starting at edges and working towards the centre (or to the outside edge in case of super elevated curve). Each pass of the roller shall uniformly overlap not less than one third of the track made in preceding pass. The roller shall be worked or started and stopped without jerks and shall not be stopped or reversed each time at the same location to cause displacement of stone and other irregularities, Consolidation shall be considered complete when the stone chippings are firmly embedded.

Generally five to six trips shall be made thorough compaction of the surface or as may be specified by the Engineer-in-Charge.

Along kerbs, manholes and all places not accessible to the roller, compaction shall be secured by means of steel rammers or hand rollers.

**1.5.1.3 Second Coat:**

**(a) Cleaning the road surface**

The surface shall be examined and any loose material and foreign matter shall be removed by brooming or blowing off by fanning with gunny bags, care being taken not to loosen the blindage already set.

**(b) Applying binder (hot Bitumen)**

The second coat of binder shall be applied immediately after the blinding has been set and the surface has been cleaned. The binder shall be applied at the specified rate in the manner specified for the first coat (1.5.1.2 b)

**(c) Blinding of spreading stone chippings**

Immediately after the second application of binder, the stone chippings shall be spread at the specified rate in the manner described in 1.5.1.2 c.

**(d) Consolidation of blindage**

The specifications described in 1.5.1.2 (d) shall apply. Further the prepared finished surface shall be protected from traffic for 24 hours or such period as may be specified by the Engineer-in-charge.

**1.5.1.4 Surface Finishing:** The finished surface shall be uniform and conform to the lines, grades and typical cross-sections shown in the drawings.

**1.5.1.5** The finished surface shall be thrown open to traffic on the following day. Controlling traffic shall be done by suitable methods like barricading, posting of watchman etc.

**1.5.1.6 Measurements:** The length and width of the finished work shall be measured correct to a cm along the finished surface of the road. The area shall be calculated in square metre, correct to two places of decimal.

For record purposes, the measurement for binder and stone chippings shall be taken as specified in 1.2.2 and 1.2.3 before they are actually used on the work. Premeasurements of materials taken for record purposes shall simply serve as a guide and shall not form the basis for payment.

**1.5.1.7 Rate:** The rate shall include the cost of materials and labour involved in all the operations described above, except for requires described under 1.5.1.2 (a)

**1.5.2 Surface Dressing on New Surface with Hot Bitumen One Coat**

**1.5.2.0** This type of treatment shall consist of cleaning the existing water bound macadam kankar or gravel surfaces, and applying one coat of hot bitumen on the prepared base, blinding it with stone chippings of 12.5mm nominal size and consolidation with a road roller. This type of treatment is normally done for a road with light density rubber tyred traffic and roads for temporary construction. This treatment is also done on existing water bound macadam before applying the final surface treatment. In the latter case, after applying a coat of painting the roads is thrown open to traffic till the road is consolidated. The final treatment is then given after making good the undulations etc., in the road surface.

**1.5.2.1** Preparation of Surface (Repairs and Cleaning) shall be specified under 1.5.1.2 (a).

**1.5.2.2** Applying binder, blinding, consolidation, surface finishing, measurements and rates shall be as specified under 1.5.1 except that binder shall be applied at the rate of 2.25 kg per sqm and stone chippings of size 13.2mm at 1.65 cum per 100 Sqm unless otherwise specified.

**1.5.3 Surface Dressing on Old Surface with Hot Bitumen One Coat**

**1.5.3.0** This treatment consists of cleaning old painted surfaces and applying a coat of hot bitumen on the prepared base, blinding with stone chippings and consolidation with road roller.

**1.5.3.1 Materials:** Binder shall be as specified and conform to 1.1.4 , stone chipping shall conform to grading given in Table 1.10 for 11.2mm. Unless otherwise specified or directed by the Engineer-in-charge stone chippings of 11.2mm nominal size shall be used @ 1.5 cum 100 sqm area and bitumen @ 1.95 kg per square

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metre area. A proper record shall be kept to ensure that the daily out turn of work is co-related with the quantity of bitumen used.

**1.5.3.2** Preparation of Surface (Repairs and cleaning) shall be as purified under 1.5.1.2(a).

**1.5.3.3** Applying binder, Blinding, Consolidation, Surface Finishing, Measurement and Rate shall be as specified under 1.5.1 except that the binder and chippings shall be applied at the specified rate.

**1.5.4 Surface Dressing on New Surface with Bitumen Emulsion – One Coat**

**1.5.4.0** This treatment consists of cleaning the existing water bound macadam, kankar gravel or stabilised base and other black top surfaces, applying a coat of bitumen emulsion at atmospheric temperature, blinding it with stone chippings including consolidation with a road roller.

This type of treatment is normally applied under damp conditions and for minor repair works during rainy season for roads with medium density, rubber tyred traffic such as service roads. This treatment is also done on existing water bound macadam before applying the final surface treatment. In the latter case, the road is consolidated. The final treatment is then given after making good the undulations depressions etc., in the road surface.

**1.5.4.1** Materials: Binder shall be specified and shall conform to RS grade IS:8837. Stone chipping of 13.2mm size shall conform to Table 1.10. Unless otherwise specified or directed by the Engineer-in-charge 13.2mm stone chippings shall be used @ 1.5 cum per 100 sqm area and bitumen @ 1.95 kg/sq.m. area. A proper record shall be kept to ensure that the daily out turn of work is corelated with the quantity of bitumen used.

**1.5.4.2** Preparation of Surface: The specification described in 1.5.1.2 (a) shall apply except that the binder used for patch repairs etc. shall be bitumen emulsion.

**1.5.4.3** Applying Binder: The specification described in 1.5.1.2(b) shall apply except that bitumen emulsion is not heated in boilers but it shall be spread at atmospheric temperature at the specified rate. In case the road surface is very dry the surface shall be very lightly sprinkled with water just before applying the binder.

**1.5.4.4** Blinding including consolidation, Measurements and Rate shall be as specified under 1.5.1 except that the stone chippings shall be spread at the specified rate immediately after the bitumen emulsion on application breaks i.e. changes colour from brown to black.

**1.5.5 Surface Dressing on Old Surface with Bitumen Emulsion – One Coat.**

**1.5.5.0** This treatment consists of cleaning old painted surfaces and applying a coat of bitumen emulsion on the prepared base, blinding with stone chippings and consolidation with a road roller. This type of treatment is normally done under damp conditions.

**1.5.5.1** Materials: Binder shall be as specified and shall conform to RS grade IS:8837.unless otherwise specified or directed by the Engineer-in-charge 11.2mm stone chippings shall be used @ 1.10cum per 100 sqm area and bitumen @ 1.22kg per sqm area. A proper record shall be kept to ensure that the daily out turn of work is corelated with the quantity of bitumen used.

**1.5.5.2** Preparation of surface shall be as specified in 1.5.1 except that the binder used for patch repairs etc. shall be bitumen emulsion.

**1.5.5.3** Applying binder, bitumen emulsion, blinding or Spreading to it including consolidation of blindage, measurement etc. shall be as specified under 1.5.1 except for preparation of surface and that the binder and stone chippings shall be used at the rates prescribed in 1.5.5.1.

**1.5.6 Tack coat of hot straight run bitumen**

**1.5.6.0** The rate of application of binder which shall be as specified and which shall conform to 1.1.5 shall depend on the surface on which the premix carpet is to be laid.

(a) 0.75 kg/sqm on W.B.M surface.

(b) 0.50 kg/sqm on existing black topped surface.

**1.5.6.1** Materials:

Bitumen: This shall be straight-run bitumen of penetration value 80/100 conforming to IS:73 Specifications.

**1.5.6.2** Preparation of surface:

**1.5.6.3** Cleaning: Prior to the application of bitumen, all vegetation, loose sealing compound, caked mud, animal dung, dust, dirt and foreign material shall be removed from the entire surface of the pavement and from existing dummy, construction and expansion joints (wherever existing) by means of mechanical sweepers and blows, otherwise with steel wire brushes, small picks, brooms or other implements as approved by the Engineer-in-charge. The material so removed shall be disposed off as directed by the Engineer-in-charge.

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**1.5.6.4** Weather and seasonal limitations: The tack coat shall not be applied nor any bitumen work done during rainy weather or when the surface is damp or wet or when the atmospheric temperature in the shade is 16 deg. C or below.

**1.5.6.5** Application of Tack Coat:

**1.5.6.5.1** Heating: Bitumen shall be heated in a boiler to a temperature of 165 deg. C to 175 deg. C and maintained at that temperature. Temperature shall be checked at regular intervals with the help of a thermometer.

**1.5.6.5.2** Application of Bitumen: Hot bitumen shall be applied evenly to the clean, dry surface by means of a pressure sprayer at specified rate. Even and uniform distribution of bitumen shall be ensured. Bitumen shall be applied longitudinally along the length of the pavement and never across it. Excessive deposits of bitumen caused by stopping or starting of the sprayer or through leakage or any other reason shall be suitably rectified.

**1.5.6.6** Measurements: Length and breadth shall be measured correct to a cm, along and surface of pavement. Area shall be worked out in sqm correct to two places of decimal.

**1.5.6.7** Rate: Rate shall include the cost of all materials and labour involved in all the operations described above.

**1.5.7.0** Premix carpet with hot bitumen: This type of treatment is normally applied on roads where the motor traffic is of medium intensity, but bullock cart traffic is fairly heavy. This treatment is suitable for district roads and for internal and service road in colonies. The consolidated thickness of this type of treatment shall be 2cm or 2.5cm as specified.

This treatment consists of applying a tack coat on the prepared base followed immediately by spreading aggregates precoated with specified binder to camber and consolidated.

Premix carpet shall not be laid during rainy weather or when the base course is damp or wet or when the atmospheric temperature in the shade is 16 deg. C or below:

**1.5.7.1** Preparation of Surface: This shall be done as described in 1.5.1

**1.5.7.2** Materials: Quantities of Binder, stone chipping and grading of stone chipping shall be as per Table 1.11. Binder shall be as specified and shall conform to Table 1.11. Stone chippings shall conform to grading as per Table 1.11. Quantities of materials shall be as given in Table 1.11. A proper record shall be kept to ensure that the daily out turn of work is correlated with the quantity of bitumen.

**TABLE 1.11**

Consolidated thickness of premix carpet	Binder hot bitumen		Stone chippings (in cum/100 Sq.m).	
	Carpet	13.2mm size	11.2mm size	
2.00 cm	52 kg/cum of 1.32mm size and 56 kg per cum of 11.2mm		1.8	0.90
2.50 cm	-do-		2.25	1.12

**1.5.7.3** Tack coat: The rate of application of binder for tack coat shall be as specified. The rate will be depending upon the surface on which the premix carpet is to be laid i.e. water bound macadam surface or existing black topped surface. Tack coat shall be applied as described in 1.5.6.

**1.5.7.4** Preparation of Premix: The aggregate shall be dry and suitably heated to temperature as directed by Engineer-in-charge before these are placed in the mixer to facilitate mixing with the binder.

Mixers of approved type shall be employed for mixing the aggregates with the bituminous binder.

The binder shall be heated to the temperature appropriate to the grade of bitumen approved by the Engineer-in-charge, in boiler of suitable design avoiding local overheating and ensuring a continuous supply.

The aggregates shall be dry and suitably heated to a temperature as directed by Engineer-in-charge before these are placed in the mixer. After about 15 seconds of dry mixing, the heated binder shall be distributed over the aggregates at the rate specified.

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The mixing of binder with chippings shall be continued until the chippings are thoroughly coated with the binder. The mix shall be immediately transported from the mixer to the point of use in suitable vehicles or wheel barrows. The vehicles employed for transport shall be cleaned and be covered over in transit if so directed.

**1.5.7.5 Spreading and Rolling:** The premixed material shall be spread on the road surface with rakes to the required thickness and camber or distributed evenly with the help of a drag spreader, without any undue loss of time. The camber shall be checked by means of camber boards and inequalities evened out. As soon as sufficient length of bituminous material has been laid, rolling shall commence with 6 to 9 tonne power rollers, preferably of smooth wheel tandon type, or other approved plant. Rolling shall begin at the edges and progress towards the centre longitudinally. Except on the super elevated portions rolling shall progress from the lower to upper edge. Parallel to the centre line of the pavement. The consolidated thickness shall in no place be less than the specified thickness by more than 25%. However, the average thickness shall not be less than that specified in the item).

When the roller has passed over the whole area once , any high spots or depressions which become apparent shall be corrected by removing or adding premixed materials. Rolling shall then be continued until the entire surface has been rolled to compaction and all the roller marks eliminated. In each pass of the roller, preceding track shall be overlapped uniformly by at least 1/3 width, The roller wheels shall be kept damp to prevent the premix from adhering to the wheels and being picked up. In no case shall fuel/lubricating oil be used for this purpose.

Rollers shall not stand on newly laid material as it may get deformed thereby.

The edges along the transverse of the carpet, laid and compacted earlier shall be cut to their full depth so as to expose fresh surface which shall be painted with a thin surface coat of appropriate binder before the new mix is placed against it.

Further, the prepared finished surface shall be protected from traffic for 24 hours or such period as may be specified by the Engineer-in-charge.

**1.5.7.6 Surface Finishing:** The surface regularity both in longitudinal and transverse directions shall be within the tolerances specified in Table 1.12

**TABLE 1.12**

Longitudinal profile	Cross profile
Max. permissible undulation when measured with 3M straight edge	Max. permissible variation from specified profile when measured with a camber template
10mm	6mm

The longitudinal profile shall be checked during rolling with a three metres long straight edge and graduated wedge at the middle of each traffic lane along the road. Similarly the transverse profile shall be checked with adjustable templates at intervals of 10 metres.

**1.5.7.7 Rectification:** Where the surface irregularity fall outside the specified tolerances the contractor shall be liable to rectify it to the satisfaction of Engineer-in-charge by adding fresh material and re-compacting to specifications where the surface is low. Where the surface is high the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications.

**1.5.7.8 Measurements:** The length and width of he finished work shall be measured correct to a cm along the finished surface of the road. The area shall be calculated in square metre, correct to two places of decimal.

For record purposes, the measurement for binder and stone chippings shall be taken as specified in 1.2.2 and 1.2.3 before they are actually used on the work. Premeasurements of the materials taken for record purposes shall simply serve as a guide and shall not form the basis for payment.

**1.5.7.9 Rate :** The rate shall include the cost of materials and labour involved in all the operations described above for the particular item, except for the cost of "Repairs described under para 1.5.1.2(a)".

**1.5.8 Premix Carpet with Bitumen Emulsion**

**1.5.8.0** This type of work is not ordinarily recommended but may be done in case of urgent repairs under damp conditions.

**1.5.8.1. Materials:** Binder shall be as specified and shall conform to RS grade IS: 8837 grading of 11.2mm stone chipping shall be as per Table 1.12. Quantities of bitumen emulsion and stone

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chippings shall be as specified in Table 1.13. A proper record shall be kept to ensure that the daily out turn of works is correlated with the quantity of bitumen used.

**TABLE 1.13**

**1.5**

Consolidated thickness of premix carpet	Bitumen Emulsion	Stone Chippings
	For Carpet in cum of chippings	Cum per 100 sqm
2 cm	96	2.4 (11.2mm nominal size)
2.5cm	96	3.0 (11.2mm nominal size)

**1.5.8.2.** Preparation of surface and binder application shall be as specified under 17.5.4 except that the rate of application of bitumen for tack coat shall be 0.75 kg per sqm on water bound macadam surface and 0.5 kg per sqm on black topped surface.

**1.5.8.3.** Preparation, spreading, consolidating mix, surface finishing, measurements and rate shall be as specified under 1.5.7 except that the bitumen emulsion shall not be heated but it shall be poured over the aggregate at atmospheric temperature at the correct rate before spreading on the road surface, the rolling shall commence 24 hours after spreading the mixture. The surface shall be protected by a suitable device such as barricading and posting of watchmen for closing the traffic.

**1.5.9.0 Bituminous Macadam using hot mix Plant and Paver Equipment 1.5.9.1** General: This shall consist of construction of a single or more courses of compacted crushed aggregates premixed with bitumen laid immediately after application of the tack coat. The thickness of single compacted course shall not exceed 75 mm.

**1.5.9.2** Materials :

**1.5.9.2.1** Aggregates

(a) These shall be crushed or broken from hard stones 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. These shall also be free from dirt, organic, deleterious and any other foreign matter and adherent coatings. These shall conform to the physical requirements laid down in Table 1.5 under this item.

(b) Grading: Aggregates shall conform to grading specified in Table 1.14

**TABLE 1.14**

Sieve Designation (IS: 460)	Percentage of wt. Passing the sieve	
	For 75 mm compacted thickness	For 50 mm compacted thickness
63mm	100	--
53mm	95 – 100	100
45mm	50 – 90	90 – 100
26.5mm	30 – 45	60 – 95
22.4mm	--	--
13.2mm	10 – 25	15 – 35
11.2mm	--	--
5.6mm	--	--
2.8MM	--	--
90 microns	0 – 5	0 – 5

**1.5.9.2.2** Bitumen : it shall be straight run bitumen of penetration value 80/100 conforming to IS : 73.

**1.5.9.3** Mixing : **1.5.9.3.1** Weather & Seasonal limitations : Bitumen macadam shall not be laid during rainy weather or when the surface is damp or wet or when the temperature is less than 16 deg. C under shade.

**1.5.9.4** Plant : A hot mix Plant of adequate capacity not less than 30 tonne per hr. Capacity and capable of producing a proper and uniform quality mix shall be used for preparing the mix. The plant may be either a batch type or a continuous one, having a co-ordinated set of essential units such as a drier for heating the aggregates, device for batching/ feeding by weight or volume the required

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quantities of aggregate, a binder heating and control unit for metering out the correct quantity of heated binder together with a mechanical mixer for thorough mixing of the binder and aggregates.

**1.5.9.5 Temperature:** The temperature of the binder at the time of mixing shall be in the range of 150 deg. C – 177 deg. C and of aggregates in the range of 155 deg. C – 163 deg. C. At no time, however, shall the difference in temperature between the aggregates and the binder exceed 14 deg. C. At no time shall bitumen of aggregates be over heated.

**1.5.9.6** The hot graded aggregates and bitumen shall be measured separately and as accurately as practicable, to the proportion in which they are to be mixed. Mixing shall be done thoroughly so that a homogeneous mixture is obtained in which all the particles are uniformly coated.

If feasible, a suitable site as approved by the Engineer-in-charge near the works site for the mixer and for the storage of materials shall be provided free of rent to the contractor. No claim whatsoever on this account shall be entertained by the Department.

**1.5.9.7 Transporting Mixed Materials:**

**1.5.9.7.1** The mixed materials shall be transported from mixing plant to the point of use in clean vehicles. Every precaution shall be taken to avoid segregation of mixed materials and to ensure that they do not become contaminated with dust or foreign matter. In order to maintain satisfactory temperature of materials in transit, particularly in cold weather, and to prevent undue loss of heat, adequate precautions shall be taken by covering the materials to ensure that the materials are properly protected during transportation.

The temperature of the mix in every transporting vehicle shall be checked immediately prior to discharge into the spreader. If the temperature of any batch is below the laying temperature specified in para 1.5.9.8.1 the mix shall be rejected and shall be removed from site immediately.

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**1.5.9.8 Laying:**

**1.5.9.8.1** The mix transported from the hot mix plant to the site shall be spread by means of a self propelled mechanical paver with suitable screeds capable of spreading, tamping and finishing the mixture to specified width and profile without causing segregation, dragging, burning, irregularities or other surface defects. The paver shall be capable of being operated at spread consistent with the character of the mix and the thickness of the course being laid, so as to produce a surface having a uniform density and surface texture. Where not operated on side forms, the spreader shall employ equalizing runners, evener arms or other devices to adjust the profile and confine the edges of the course to true lines. The temperature of the mix at the time of laying shall be in the range of 110 deg. C to 135 deg. C

**1.5.9.8.2** Hand spreading is prohibited.

**1.5.9.9 Rolling:**

**1.5.9.9.1** After spreading of the mix consolidation shall be done by an approved power driven roller or rollers weighing not less than 8/10 tonnes each. Rolling shall start as soon as possible after the material has been spread. Rolling shall be done with care to keep from unduly roughening of the pavement surface. Rolling shall start longitudinally at the sides and proceed towards the centre of the pavement, over lapping on each successive trip by atleast one half the width of a rear wheel. End stop channel boards may have to be used if the middle portion of the pavement is taken first. Alternate strips of the roller shall be slightly different lengths.

**1.5.9.9.2** The speed of the roller shall not exceed 5 km per hour and shall at all points be slow enough to avoid displacement of the mixture and, any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall at once be corrected by the use of rakes and addition of fresh mixture where required.

**1.5.9.9.3** When the roller has passed over the whole area once, any high spots or depressions which become apparent shall be corrected by removing or adding fresh material. Rolling shall then proceed continuously with at least 10 passes of the roller till no further compaction is possible. To prevent adhesion of the mixture to the wheels of the roller, the wheel shall be kept damp with water, but excess of water shall not be permitted. In no case shall fuel lubricating oil be used for this purpose.

**1.5.9.10 Joints:**

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**1.5.9.10.1** Longitudinal joints and edge 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 are 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 minimum of one and a half times the layer thickness, whichever is the greater. 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 lane continues. Nothing extra shall be paid on this account.

**1.5.9.10.2** Transverse Joints: They shall be formed at right angles to the longitudinal joints, and truly vertical. The exposed vertical edges of the transverse joint shall be cut back and trimmed to firm material or for a distance of not less than 1.5 times the thickness of layer whichever is greater. 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 land continues. Nothing extra shall be paid on this account.

**1.5.9.11** Pavement Edges: Pavement shall be laid to correct width and alignment. To achieve straight and vertical edges, 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.

**BITUMEN**

**(Surface course and Base course)**

**Do**

- ⌚ Specific Gravity test to confirm the bitumen is adulterated or not
- ⌚ Penetration test to know the grade of bitumen
- ⌚ Softening point test to know whether the bitumen is CRMB or not
- ⌚ Unit weight test to fix the binder content for PCSC
- ⌚ Sieve test for ascertaining the gradation of aggregates
- ⌚ Binder content test for the mix conveyed to the site before laying, to know the correct binder content.
- ⌚ Proper overlaps while rolling
- ⌚ Density check for ascertaining the compaction
- ⌚ Maintain Q.C, registers and list of tests frequency quoted
- ⌚ Proper compaction for pipe laid portion of culverts to avoid sinking

**Do not**

- ⌚ Put dust over the compacted surface since it will bleed and reduce the binder content
- ⌚ Over heat the bitumen since it will loose all its properties
- ⌚ Allow many loads to stand unloaded at the site, if so engage more rollers or monitor through mobile phone or return the mix.
- ⌚ Add water to the bitumen emulsion during prime coat or tack coat application
- ⌚ Allow the roller to run fast
- ⌚ Allow wheel tracks while rolling
- ⌚ Tack coat excess at the center of the two lane, since it will bleed and possible skidding will occur.
- ⌚ Forget to maintain camber and super elevation
- ⌚ Forget to edge pack the B.T. edges immediately after laying

**(SPECIAL CONDITIONS – SAFETY)**

1. The following are a few safety measures suggested while carrying the work. However all the items of work should be carried out in safe working manner taking all precautions .
2. Proper and necessary precautions shall have to be taken wherever the work involves breaking of old road/ cement concrete and dismantling of brick work. These items of work will have to be carried in the presence of the Engineer-in-charge.

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- 3 The contractor shall keep supply all safety equipment like safety boots, goggles, helmets and safety belts, to all the workers.
- 4 The contractor shall keep a supervisor always at work site.
- 5 Power shut down shall be taken before commencement of the work wherever power cables are running.
- 6 The contractor shall take all necessary safety precautions and arrange for appropriate appliance to its authorized officials to prevent loss of human lives, injuries to personnel engaged and damage to property.
- 7 The Contractor shall provide to the work force and ensure the use of the following personnel Protective Equipment as found necessary and as directed by the authorized BHEL Officials.
  - i) Safety Helmets conforming to IS: 2925, 1981
  - ii) Safety shoes conforming to IS: 1.4544. 1998
  - iii) Eye, and face protection devices conforming to IS: 1179, 1967.
  - iv) Hand and body protection devices conforming to IS: 2573 - 1975, IS: 6994 - 1973 and IS 8520 - 1978, IS: 578-1985 and IS 6694.

**SAFETY IN CIVIL ENGINEERING WORKS**

1. While working at heights, a safe foot holds and hands holds should be provided.
2. No loose material should be allowed to remain in the vicinity of persons working at Heights due to which they may inadvertently loose there balance and fall down.
3. Wherever, it is reasonable practical, workers should be made to use safety belts.

**DEMOLITION:**

1. Safe access should be provided to every place at which any person has to work. Scaffolds to be provided for all work that cement safety be done otherwise.
2. Shoring or either steps are to be taken to prevent accidental collapse of the building or part of the building being dismantled.
3. Similar precautions are to be taken against collapse of any adjacent building, if this would involve danger.
4. No steel work or iron work is to be cut or released unless precautions are taken to avoid danger from sudden twist, spring or collapse.
5. No framing is to be removed unless all practicable steps are taken to avoid collapse of the structure.
6. Demolition work is to be placed under the supervision of a competent person experienced in demolition work.

**EXCAVATIONS:**

1. Barriers are to be provided round excavations, shafts, pits and opening into which persons can fall a vertical distance of 1.98 meters. These barriers are to be as close as practicable to the edge of the excavations and are to be erected as soon as practicable after excavating begins. They are to be maintained in position except when necessarily removed for the access of persons or materials.
2. Adequate and suitable timbering should be used to prevent danger from falls or dislodgement of sides of excavations etc., or materials adjacent to it. Timbering is to be done as early as practicable in the course of work.

**SAFETY DURING WORK.**

1. Contractor must provide safety equipment (PPE) to his workers during work at site.
2. Contractor must depute a qualified supervisor at all times during the work. He shall be responsible for ensuring safety at site.

**MATERIAL HANDLING AND STORAGE**

Adequate arrangement be made for material handling & storage taking due care against damages.

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT

Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
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**ACCOUNTING**

Proper method of accounting of material be followed. The books of such accounting be offered for auditing by BHEL at pre-decided regular interval.

If the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipments or to carry out instructions issued by the authorized BHEL officials, BHEL shall have the right to take corrective steps at the risk and cost of the contractors.

In case of a fatal or disabling injury accident to any person due to lapses by the contractor. BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim or his/her dependents. Before imposing the penalty, appropriate enquiry shall be held by BHEL.

In case of any damage to propriety due to the lapses by the contractor, BHEL shall have the right to recover the cost of such damages from the contractor after holding an appropriate enquiry.

In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL, shall have the right to recover cost of such delay from the payments due to the contractor after notifying the contractor suitably.

If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so. BHEL shall have the right to terminate the contract and get the job completed at the risk and cost of the sub contractors.

The carpeting work on the site shall be deemed to have been taken over by the Bharat Heavy Electricals Limited when the Executive Engineer will have certified in writing that the work has satisfied the contract conditions and such certificate shall not unreasonably be withheld, nor shall delay the issue of such certificate solely on account of minor omissions or defects, which do not affect its functional utility without any serious risk to the original civil structure, provided always that the contractor undertakes to make good such omissions and defects at the earliest possible moment. Such certificates, however, shall be deemed to be on account and shall in no way release the Contractor from his liabilities and responsibilities in respect of such structure.

**SCHEDULE 'B'**  
**MATERIALS FOR ISSUE TO THE CONTRACTOR**

Sl.No.	Materials	Rates
1.	CEMENT	Rs.200/- per bag

**SCHEDULE 'C'**  
**TOOLS & PLANT TO BE HIRED TO THE CONTRACTOR**

Sl.No.	T & P	Rates
1.	Jack Hammer (only if working & available in civil deptt.)	Rs.20/- per hour

Important condition: Work cannot be delayed on the pretext that BHEL has not been able to provide the above equipment. Contractor will have to make his own arrangement if the above T&P is not available.

Signature, seal & issuing authority

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BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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**SPECIAL CONDITIONS**

1. These special conditions supplement the conditions to tenders and contract and the general conditions of contract and form part of the contract documents. Where these special conditions are at variance with the general conditions of contract these special conditions shall prevail.
2. All rates quoted shall be for finished work in-situ inclusive of all leads, lifts and other incidental charges and those general conditions.
3. The tenderer is not allowed to alter the specifications of the unit of work noted in the Schedule ( Bill of quantity ) . For the sake of uniformity in comparison of tenders, tenders should not add any conditions of their own. Tenders not complying with these conditions are liable for rejection.
4. The issues of materials are governed by the conditions specified in Schedule B &C. all other materials shall be supplied by the contractor himself and the rates for the relevant items are inclusive of all such supplies.
5. The works shall be executed as per the technical specifications and drawings. A tentative sketch / drawing of the work is available in the office, which is intended to give a general idea of the work to be executed and is liable for modifications during the actual execution based on the designs prepared and approved by the Competent authority. The detailed drawings shall be provided after obtaining from the consultants.
6. The quantities shown above are approximate and liable for variations and no rate variation is acceptable on this account.
7. The rates quoted by the contractor shall be firm in all respects. Any statutory increase in the labor wages and materials during the period of execution shall be borne by the contractor. The contractor shall quote the rates considering the above.
8. The tenderer should specify the plant and machinery such as a road roller, Hot mixed plant paver machine etc. that he possesses and is going to use them on the work.
9. Contractor shall execute work as per specifications in the Price Schedule A. if the specifications found wanting relevant Technical specifications along with the tender shall be followed. Further missing details relevant CPWD and IS specifications shall be followed. Wherever, there is difference in between CPWD and IS specifications latter shall prevail.
10. The BHEL reserves the right to deviate either by additions or by deductions from the schedule of items of work given in the tender document after awarding work.
11. In case of any difference between agreement wording and detailed drawings the interpretation of the BHEL shall be final and binding on the contractor.
12. The final acceptance of work in all items are subject to proper performance after testing regardless of whether the items are paid for or not.
13. All debris and surplus materials shall be cleared from the site as and when directed by the Engineer-in-charge. Any temporary structure / stores made by the contractor for the work shall be demolished and site cleared before payment of final bill.
14. Rates tendered by contractors shall be for complete item of the work covering all materials, labor, carriage, royalties, work contract, sales tax, octroi, wastage, tools & plants including all other taxes on temporary construction, overhead charges, profits, general royalties, risks etc., and rate shall be applied to all heights, levels, depths, leads and lifts etc. (Please refer schedule B for free issue items and chargeable items)
15. If discrepancy in specifications observed between schedule of quantities and general / technical conditions, the specifications in schedule of quantities will have precedence over the general / technical conditions.
16. Water will be supplied at one point and will be charged @ **1% of gross value of the bill.**
17. Construction equipment shall not be provided by BHEL and they are in scope of contractor.
18. Quantity/Quality records of Bitument ,aggregates , test records shall be prepared, maintained and submitted by contractor during the course of execution.
19. Rate for supplementary items, which are not covered in Schedule A, will be finalized as per CPWD Specifications.
20. Specialized works are to be executed by specialized agency with the approval of BHEL.
21. Test Certificates are to be supplied for all bought-out items as required by the Engineer-in-charge.

Signature, seal & issuing authority

Sign, seal & date of contractor



BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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22. Any electric power required for contractors' lighting/machinery for the purpose of work shall be supplied **FREE OF COST** by the company at the written request of the contractor at one point subject to the observance of rules and regulations of Electric board / company free of cost. If it is observed that power is being wasted, BHEL shall have the right to recover cost of such consumption including arrears. Power will **not** be allowed for **cooking** and **room (air) heating** in winter season: For this purpose, on written application chargeable power can be allowed. The rates shall be the rates applicable for industrial consumption in U.P.
23. Water and power will be given at one point. All other things to be arranged by Contractor.
24. In execution of all scheduled items shall be done as per CPWD latest specification, if CPWD specification does not provide details of specification **of any item of work then best** of the other specification to be followed. execution of all scheduled items CPWD SPECIFICATIONS AND RELEVANT IS CODES ARE TO BE FOLLOWED
25. All materials issued by Bharat Heavy Electricals Limited either as free issues or on cost recovery basis should be returned in kind and in good condition as detailed in respective Clauses.
26. No extra claim or condition in regard to wages or materials escalation will be entertained and any tender containing such stipulation will be rejected.
27. All rates quoted shall be for finished work in-situ inclusive of all leads, lifts and other incidental charges etc., and those in general conditions of contract.

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT**

Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
TENDER NOTICE NO. FCX / TE / 2 / 06 / R DT 31/08/2012

**BLANK PRICE BID**

**SCHEDULE A ( Schedule of Quantity )**

S. No.	CPWD DSR 2007 item No.	Description of items	Unit	Qty	Rate as per DSR 2007	Amount (Rs)	Rate offered by contractor in %
1	16.13.1/241	Cutting road and making good the same including supply of extra quantities of materials i.e. aggregate, moorum screening, red bajri and labour required. bituminous portion	m3	12	1081.80	12981.60	.....% (Above / below ) over DSR 2007 rates for items no. 1 to 15
2	16.3.1/240	Supplying and stacking at site. 90 mm to 45 mm size stone aggregate.	m3	1	742.30	742.30	
3	16.3.2/240	Supplying and stacking at site. 63 mm to 45 mm size stone aggregate.	m3	1	768.45	768.45	
4	16.3.10/240	Supply and stacking at site. Moorum.	m3	1	421.85	421.85	
5	16.4/240	Laying spreading and compacting stone aggregate of specified sizes to WBM specifications including spreading in uniform thickness, hand picking , rolling with 3 wheeled road / vibratory roller 8-10 tonne in stages to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate watering and compacting to the required density .	m3	2	192.55	385.10	
6	16.30.2/243	Providing and applying tack coat using hot straight run bitumen of grade 80/ 100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications : On bituminous surface @ 0.50 Kg / sqm.	sq m	24665	17.15	423004.75	
<b>Total "A1" ( Item no 1 to Item no.6 )</b>					<b>Rs.</b>	<b>438304.05</b>	

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT**

Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
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S. No.	CPWD DSR 2007 item No.	Description of items	Unit	Qty	Rate as per DSR 2007	Amount (Rs)	Rate offered by contractor in %
7	16.55.1/248	Providing and laying Bituminous Macadam on prepared surface with specified graded crushed stone aggregate for profile corrective base/ binder course including loading of aggregate with F.E. loader , hot mixing of stone aggregates and bitumen in hot mix plant, transporting the mixed material by tippers to paver and laying the mixed material with paver finisher fitted with electronic sensing device to the required level and grade and rolling with road rollers, as per MORTH specification to achieve the desired density and compaction but excluding the cost of primer/ tack coat. 50mm / 75mm average compacted thickness with bitumen of 60/70 grade @ 3.5% (Percentage by weight of total mix)	M <sup>3</sup>	566	4450.85	2519181.10	.....% (Above / below ) over DSR 2007 rates for items no. 1 to 15
8	16.56.1/249	Providing and laying Dense Bituminous concrete on prepared surface with specified graded stone aggregate for wearing course including loading of aggregate with F.E. loader , and hot mixing of bitumen with filler and stone aggregate in hot mix plant , transporting the mixed material by tippers to paver and laying the mixed material with mechanical paver finisher fitted with electronic sensing device to the required level and grade and rolling with road rollers, as per MORTH specification, to achieve the desired density and compaction but excluding cost of primer/ tack coat. 40 mm/50mm compacted thickness with bitumen of grade 60/ 70 @ 5.5% and lime @3% (percentage by weight of total mix).	m3	415	5856.10	2430260.75	
9	16.37.1/245	Providing and laying bitumen mastic wearing course (as per specifications) with industrial bitumen of grade 85/25 conforming to IS : 702 prepared by using mastic cooker and laid to required level and slope including providing antiskid surface with bitumen precoated fine grained hard stone chipping of approved size at the rate of 0.005 cum per 10 sqm and at approximates spacing of 10cm centre to centre in both directions, pressed into surface protruding 1mm to 4mm over mastic surface, including cleaning the surface, removal of debris etc. all complete. ( Considering bitumen using 10.2% as per MORTH specification.) 25mm thick.	M <sup>2</sup>	150	493.45	74017.50	
<b>Total "A2" ( Item no 7 to Item no.9 )</b>						<b>Rs.</b>	

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
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S. No.	CPWD DSR 2007 item No.	Description of items	Unit	Qty	Rate as per DSR 2007	Amount (Rs)	Rate offered by contractor in %	
10	16.37.2/245	Providing and laying bitumen mastic wearing course (as per specifications) with industrial bitumen of grade 85/25 conforming to IS : 702 prepared by using mastic cooker and laid to required level and slope including providing antiskid surface with bitumen precoated fine grained hard stone chipping of approved size at the rate of 0.005 cum per 10 sqm and at approximates spacing of 10cm centre to centre in both directions, pressed into surface protruding 1mm to 4mm over mastic surface, including cleaning the surface, removal of debris etc. all complete. ( Considering bitumen using 10.2% as per MORTH specification.) 40mm thick.	M <sup>2</sup>	1500	789.50	1184250.00	.....% (Above / below ) over DSR 2007 rates for items no. 1 to 15	
11	16.62/250	Providing and applying 2.5mm thick road marking strips (retro-reflective) of specified shade/ colour using hot thermoplastic material by fully/ semi automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour ,T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-incharge and accordance with applicable specifications.	M <sup>2</sup>	140	497.30	69622		
12	16.50/247	Providing and fixing Glow studs of size 100x20 mm made of heavy duty body shall be moulded ASA (Acrylic styrene Acryloretrite ) or HIP (High impact polystyrene) or ABS having electronically welded micro- prismatic lens with abrasion resistant coating as approved by Engineer in charge. The glow stud shall support a load of 13635 kg tested in accordance with ASTM D4280. The slope of retro- reflective surface shall be 35 +/-5 degrees to base .The reflective panels on both sides with at least 12 cm of reflective area up each side. The luminance intensity should be as per the specification and shall be tested as described in ASTM I: 809 as recommended in BS: 873 part 4 : 1973. The studs shall be fixed to the Road surface using the adhesive conforming to IS, as per procedure recommended by the manufacturer complete and as per direction of engineer incharge.	each	355	536.60	190493.00		
<b>Total "A3" ( Item no 10 to Item no.12 )</b>						<b>Rs.</b>	<b>1444365.00</b>	

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT**

Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
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S. No.	CPWD DSR 2007 item No.	Description of items	Unit	Qty	Rate as per DSR 2007	Amount (Rs)	Rate offered by contractor in %
13	16.61/250	Providing Retro-reflective regulatory sign board of size 900mm dia meter made out of 2mm thick aluminium sheet, face to be fully covered with high intensity encapsulated lens type retro -reflective sheeting as approved by Engineer-in-charge . Letter, symbols, borders etc. will be as per IRC - 67 with required colour scheme on the boards and with the high intensity grade A. The aluminium sheet to be riveted to M.S. frame of angle iron of size 40x40x4mm The boards will be fixed to 1 No. 50x50mm square post made of M.S. angle 50x50x4m, 4m long welded to the frame with adequate anti-theft arrangement .Sheet work to be painted with two or more coats of synthetic enamel paint over an under coat (primer) and back side of aluminium sheet to be painted with two or more coats of epoxy paint including appropriate priming coat complete in all respects as per direction of Engineer-in-charge.	M <sup>2</sup>	7	4119.40	28835.80	.....% (Above / below ) over DSR 2007 rates for items no. 1 to 15
14	16.65/251	Providing and fixing post delineators made of ABS round body fitted with 2 nos 100mm dia high reflective, reflectors and mounted on MS pipe of 65mm dia duly powder coated anti-rust and anti theft steel to be installed as per direction of Engineer-in-charge.	each	4	786.35	3145.40	
15		Any other DSR 2007 items not covered above .	LS	As Required	DSR RATE	250000.00	
		<b>Total "A 4" ( Item no 13 to Item no.15 )</b>			<b>Rs.</b>	<b>281981.20</b>	
		<b>Sub Total " A" =( A1 + A2 + A3 + A4 )</b>			<b>Rs.</b>	<b>7188109.60</b>	
		(...% (Above / below ) over DSR 2007 rates for items no. 1 to 15 ) Amount Sub total B ( A ± Ax ...%)			<b>Rs</b>		
		<b>Grand total C( A ±B)</b>			<b>Rs</b>		
		<b>Service tax extra as applicable</b>					

**Note:- Contractor Should not offer Rates in Blank Price Bid**

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
FACTORY CIVIL DEPARTMENT**

Name of work:- Road carpeting work in BHEL premises for year 2012-13.  
TENDER NOTICE NO. FCX / TE / 2 / 06 / R DT 31/08/2012

**PRICE BID**

**SCHEDULE A ( Schedule of Quantity )**

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6	16.30.2/243	Providing and applying tack coat using hot straight run bitumen of grade 80/ 100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications : On bituminous surface @ 0.50 Kg / sqm.	sq m	24665	17.15	423004.75	
<b>Total "A1" ( Item no 1 to Item no.6 )</b>					<b>Rs.</b>	<b>438304.05</b>	

Signature, seal & issuing authority

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**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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<b>Total "A2" ( Item no 7 to Item no.9 )</b>						<b>Rs. 5023459.35</b>	

Signature, seal & issuing authority

Sign, seal & date of contractor



**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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12	16.50/247	Providing and fixing Glow studs of size 100x20 mm made of heavy duty body shall be moulded ASA (Acrylic styrene Acryloretrite ) or HIP (High impact polystyrene) or ABS having electronically welded micro- prismatic lens with abrasion resistant coating as approved by Engineer in charge. The glow stud shall support a load of 13635 kg tested in accordance with ASTM D4280. The slope of retro- reflective surface shall be 35 +/-5 degrees to base .The reflective panels on both sides with at least 12 cm of reflective area up each side. The luminance intensity should be as per the specification and shall be tested as described in ASTM I: 809 as recommended in BS: 873 part 4 : 1973. The studs shall be fixed to the Road surface using the adhesive conforming to IS, as per procedure recommended by the manufacturer complete and as per direction of engineer incharge.	each	355	536.60	190493.00		
<b>Total "A3" ( Item no 10 to Item no.12 )</b>						<b>Rs.</b>	<b>1444365.00</b>	

Signature, seal & issuing authority

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**BHARAT HEAVY ELECTRICALS LIMITED , JHANSI  
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15		Any other DSR 2007 items not covered above .	LS	As Required	DSR RATE	250000.00	
		<b>Total "A 4" ( Item no 13 to Item no.15 )</b>			<b>Rs.</b>	<b>281981.20</b>	
		<b>Sub Total " A" =( A1 + A2 + A3 + A4 )</b>			<b>Rs.</b>	<b>7188109.60</b>	
		(...% (Above / below ) over DSR 2007 rates for items no. 1 to 15 ) Amount Sub total B ( A ± Ax ...% )			<b>Rs</b>		
		<b>Grand total C( A ±B)</b>			<b>Rs</b>		
		<b>Service tax extra as applicable</b>					

Signature, seal & issuing authority

Sign, seal & date of contractor