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**Centre of Plasma Physics - Institute for Plasma Research
Nazirakhat, Tepesia, Sonapur, Kamrup (M)
Pincode – 782402, Assam, India
Tel.: + 91 - 361 - 2220010
Fax: +91 - 361 - 2238240**

TECHNICAL BID

Name of work:

**Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and
Construction of Canteen Building including Plumbing and Electrification
at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam - 782402**

Tender No. CPP-IPR/NIT/2015-16/22 DATED 09.07.2015

Name and Address of Tender Inviting Authority:

Centre Director

Centre of Plasma Physics – Institute for Plasma Research

Nazirakhat, Tepesia, Sonapur, Kamrup (M)

Pincode – 782402

Assam, India

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SECTION 1: NOTICE INVITING TENDER

Centre of Plasma Physics - Institute for Plasma Research
Nazirakhat, Tepesia, Sonapur, Kamrup (M)
Pincode – 782402, Assam, India
Tel.: + 91 - 361 - 2220010
Fax: +91 - 361 - 2238240

Advt. No.: 5/2015

Notice Inviting Tender (NIT)

Sealed item rate tenders are invited by the Centre Director, Centre of Plasma Physics – Institute for Plasma Research, Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402, in **TWO BID** (Technical Bid & Price Bid) from eligible contractors, as per details given below for the following work:

NIT No.: CPP-IPR/NIT/2015-16/22 DATED 09.07.2015

Name of Work:

Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402

Estimated cost put to tender: Rs. 4,52,65,000.00

Completion Period: 12 Months

Earnest Money Deposit: EMD of Rs. 9,05,300.00 to be submitted in the form of DD/BG by Scheduled Bank in favour of Institute for Plasma Research, A/c CPP Payable at Sonapur

Fee of Tender Document: Rs. 1,500.00

Bids are available for sale at the office of: **Centre of Plasma Physics - Institute for Plasma Research**
Nazirakhat, Tepesia, Sonapur, Kamrup (M)
Pincode – 782402, Assam, India
From **13/07/2015 (10:00 Hrs.)** to **10/08/2015 (15:00 Hrs.)**

The complete bidding document is also available on the website www.cppipr.in. Bidders desirous to submit their bid on the basis of downloaded document shall pay the cost of bidding document by crossed Demand Draft along with the Techno Commercial Bid.

Date and Time for submission of Tenders: On or Before **11/08/2015 13:30 Hours**

Date and Time of opening of Technical Bid: On **11/08/2015 at 14:00 Hours**

The Centre Director, CPP-IPR, reserves the right to accept or reject the tender(s) in full or in part, of any or all tenderers, or to cancel the tender in Toto without assigning any reason thereof.

Sd/-
Centre Director, CPP-IPR

PART A - INFORMATION AND INSTRUCTIONS FOR TENDERING

DETAILED NOTICE INVITING TENDER (NIT):

Sealed item rate tenders are invited by Centre of Plasma Physics – Institute for Plasma Research, Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402, in **TWO BID** (Technical Bid & Price Bid) from eligible contractors, as per details given below for the following work:

1	NIT No.	Tender No.: CPP-IPR/NIT/2015-16/22 DATED 09.07.2015
2	Name of work	Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402
3	Estimated cost put to tender	Rs. 4,52,65,000.00
4	Earnest Money Deposit (EMD)	EMD of Rs. 9,05,300.00 (Rupees Nine Lakh Five Thousand Three Hundred Only) to be submitted in the form of Demand Draft / Bank Guarantee by Scheduled Bank in favour of Institute for Plasma Research, A/c CPP Payable at Sonapur Note: 1) EMD in the form of cheque will not be accepted. Bids received without requisite EMD shall be summarily rejected.
5	Completion period	12 months (including monsoon period)
6	Fee of Tender Document	Rs. 1,500.00 (Rupees One Thousand Five Hundred Only) to be submitted in the form of Demand Draft in favour of Institute for Plasma Research, A/c CPP Payable at Sonapur
7	Performance Guarantee	5.0 % of Tendered Value

8	Security Deposit	2.5 % of Tendered Value
9	Issue of Tender Documents	<p>Bids are available for sale at the office of</p> <p>Centre of Plasma Physics - Institute for Plasma Research Nazirakhat, Tepesia, Sonapur, Kamrup (M) Pincode – 782402, Assam, India</p> <p>From 13/07/2015 (10:00 Hrs.) to 10/08/2015 (15:00 Hrs.) During Office Hours only (Monday to Friday)</p> <p>The complete bidding document is also available on the website www.cppipr.in; bidders desirous to submit their bid on the basis of downloaded document shall pay the cost of bidding document by crossed Demand Draft in favour of</p> <p>Institute for Plasma Research, A/c CPP Payable at Sonapur</p> <p>along with the Techno Commercial Bid, failing which, their bid shall not be considered for opening/evaluation.</p>
10	Site visits by Bidders, if any	<p>Up to 07/08/2015 (17:00 Hours) Contact: +91 361 2220010</p>
11	Date for seeking Pre-Bid Clarification	On 29/07/2015 From 10:00 Hrs. to 15:00 Hrs.
12	Date and Time for Submission of tenders	On or Before 11/08/2015 (13:30 Hours) at the Office of CPP-IPR, Nazirakhat, Sonapur, Kamrup (M), Assam - 782402
13	Date and time of opening of Technical Bid	On 11/08/2015 at 14:00 Hours in the presence of Bidders' Authorized representative.
14	Date and time of opening of Price Bid of Qualified Bidders	Will be notified at a later date.
15	Place of Submission of Bid	Centre of Plasma Physics - Institute for Plasma Research Nazirakhat, Tepesia, Sonapur, Kamrup (M) Pincode – 782402, Assam, India

NOTE:

1	Estimated Cost is given merely as a rough guide.
2	Agreement shall be drawn with the successful bidders on prescribed / Standard Form as specified in the Tender Documents. Bidder shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3	The time allowed for carrying out the work will be from the date of start as defined in schedule 'F' of Performa of schedules or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4	The site for the work is available.
5	The bid document consisting of Technical Bid, Price Bid (the schedule of quantities of various types of items to be executed) Technical bid contains Conditions of Contract , Technical Specifications, Drawings , Time Schedule, etc.
6	The contractor whose bid is accepted will be required to furnish performance guarantee of 5% (Five Percent) of the TENDERED amount within the period specified in Schedule F of Technical Bid .
7	Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost, all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidders implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.
8	The competent authority does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
9	Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
10	The contractor shall not be permitted to bid for works in the CPP-IPR, responsible for award and execution of contracts, in which his near relative is posted as equivalent to Accounts Officer or as an officer in the capacity of grades Scientific Officer "C" and above. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relative to any officer in the Institute for Plasma Research. Any breach of this condition by the contractor would render him liable to be barred from tendering in the Institute.
11	No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government Services, without the previous permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.

12	Validity of Tender: The tender for the work shall remain open for acceptance for a period of 120 days from the last date of submission of tenders . If any tenderer withdraws his tender before the said period, or issue of Letter of Intent, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the Institute, then the Institute shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money absolutely. Further the tenderer shall not be allowed to participate in the re-tendering process of the work.
13	Tender documents & signing of contract: The Notice Inviting Tender shall form a part of the contract document. The successful tenderer/ contractor, on acceptance of his tender by the Accepting Authority, shall within 15 days from the stipulated date of start of the work, sign the contract.
14	Director, CPP-IPR does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without assigning any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
15	Director, CPP-IPR reserves the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16	Institute reserves the right to accept or reject the tender(s) in full or in part, without assigning any reason thereof. Tenders with any conditions including conditional rebate shall be rejected forthwith

INFORMATION AND INSTRUCTIONS:

1.0 GENERAL:

- 1.1.** All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a “Nil” or “no such case” entry should be made in that column. If any particulars/queries are not applicable in case of the Bidder, it should be stated as “Not Applicable”. The Bidders may please note that giving incomplete/unclear information called for in the forms, or making any change in the prescribed forms, or deliberately suppressing any information, may result in disqualification of the Bidder summarily.
- 1.2.** The Bidder should sign each page on the application along with enclosures with rubber stamp before submitting the bid.
- 1.3.** Overwriting should be avoided. Corrections, if any, should be made by neatly crossing out and shall be rewritten with initials and date. Pages of the pre-qualification document are numbered. Additional sheets, if any added by the Bidder, should also be numbered by him. They should be submitted along with letter of transmittal.
- 1.4.** References, information and certificates from the respective clients certifying suitability, technical knowhow or capability of the Bidder should be signed by an officer not below the rank of Executive Engineer or equivalent.
- 1.5.** The Bidder may furnish any additional information, which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of tender document unless the Institute calls for it.
- 1.6.** Any information furnished by the Bidder found to be incorrect either immediately or at a later date, would render him liable to be debarred from tendering/taking up of work in **CPP-IPR**.
- 1.7.** Any clarification given by the Institute on the basis of queries raised by the Bidders shall be uploaded on the website and shall become part of the tender condition.

1.8. Confidentiality Clauses: -

i) Confidentiality:

No party shall disclose any information to any ‘Third party’ concerning the matters under this contract generally. In particular, any information identified as " Proprietary" in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

This clause shall apply to the sub-contractors, consultants, advisors or the employees engaged by a party with equal force.

ii) "Restricted Information":

Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, adviser or the employees of a contractor, will invite penal consequences under the above said legislation.

iii) Prohibition against use of **CPP-IPR's** name without permission for publicity purposes: The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use **CPP-IPR's** name for any publicity purpose through any public media like Press, Radio, TV or Internet without the prior written approval of CPP-IPR.

2.0 FINAL DECISION MAKING AUTHORITY:

The Center Director, **CPP-IPR** reserves the right to accept or reject any application/s and to annul the pre-qualification process and reject all applications at any time, without assigning any reason or incurring any liability to the Bidders.

GENERAL RULES & DIRECTIONS

1.0 Scope of Bid:

The Institute invites bids for the work. The successful bidder should provide the services during the period of work as per the terms and conditions specified in the NIT, General Conditions of Contract, Technical Specifications, Special Conditions of Contract and Schedules.

2.0 Eligible Bidders

- 2.1 Bidding is open to all eligible bidders meeting the eligibility criteria as defined. Bidders are advised to note the eligibility criteria specified in the Notice Inviting Tender.
- 2.2 Incomplete bids and bidders not meeting the minimum qualification criteria shall be summarily rejected. It may be noted that mere submission of bid does not imply that your offer shall be considered. Tenders are considered only after **CPP-IPR** themselves assess the document submitted along with the bid by the bidder meets the eligibility criteria as specified in Notice Inviting Tender during evaluation of bid.
- 2.3 The bidder who has been blacklisted/de-registered/holidayed at any of the sites of IPR or any other government department, shall not be eligible for participation in tenders of **CPP-IPR** for that period.

3.0 One Bid per Bidder

- 3.1 Each bidder shall submit only one bid. A bidder who submits or participates in more than one bid will cause the bidder's participation to be disqualified for all the proposals.

4.0 Cost of Bidding

- 4.1 The bidder shall bear all costs associated with the preparation and submission of his bid and the corporation will in no case be responsible and liable for these costs.

5.0 Site visit

- 5.1 The bidder and any of his authorized personnel or agents will be granted permission by **CPP-IPR** to enter upon its premises and lands for the purpose of site visit. The Bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings by himself, collect all information that he considers necessary for proper assessment of the prospective assignment. He may contact **CPP-IPR** (Tel. +91 361 2220010) for fixing appointment prior to visiting the site. However, the bidder,

his personnel and agents will be responsible against all liability in respect thereof, including death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

- 5.2 The bidder should inform the Institute at least Two days in advance about the proposed site visit.
- 5.3 The bidder, at his own responsibility and risk is encouraged to visit, inspect and survey the site and its surroundings and satisfy himself before submitting his bid as to the form and nature of the site, the means of access to the site, the accommodation he may require, etc.
- 5.4 In general, bidders shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site, whether he inspects it or not and no extra claims due to any misunderstanding or otherwise shall be allowed.
- 5.5 The costs of visiting the site shall be at the bidders' own expense. Any report shared at the site, by the corporation is subject to verification by the contractor. Any deviations of information in the report and the actual site will not be the responsibility of the **CPP-IPR**.
- 5.6 The bidders are requested to bring photo identification like passport, voters' identity card, and driving license, PAN card, identity card issued by employer etc. for security regulations. Any electronic devices like mobiles, radio, transistors camera etc. are not allowed inside **CPP-IPR** premises and the same shall be left at security gate at the risk of bidders.
- 5.7 The bidder shall seek clarifications for any query/question on the stipulated date and time given in the NIT. The clarification given by **CPP- IPR** shall be visible to all the bidders without disclosing the identity of the bidder raising the query. The questions/query received after stipulated date and time shall not be entertained and no response shall be forwarded. The submission of bid shall mean that the bidder has seen the response and accepts the content.

6.0 Content of Bidding Documents

- 6.1 Submission of a bid by a bidder implies that he has read this notice and all other contract documents, clarification, addendum, corrigendum and has made himself aware of the scope and specifications of the work to be executed and of conditions.
- 6.2 The bidder shall submit the bid, which satisfies each and every condition laid down in the bid documents, failing which, the bid is liable to be rejected.

7.0 Amendment of Bid Documents

- 7.1 Before the deadline for submission of bids, **CPP-IPR** may modify the bidding documents by issuing addenda on their web site.

- 7.2 Any addendum so issued shall be part of the bid documents as well as contract document.
- 7.3 To give prospective bidders reasonable time to take an addendum into account in preparing their bids, **CPP-IPR** may extend the date for submission of bids, if necessary.
- 7.4 Corrigendum, addendum or any other information regarding tender shall be uploaded on web site. Hence, the bidders are requested to visit the web site regularly. The above documents shall become part of bid and agreement. Submission of bid shall imply that bidder has noted and accepted content of all the corrigendum/addendum/clarifications and affect of same has been included in price bid.

8.0 Language of the Bid

- 8.1 All documents relating to the bid shall be in the English language, unless stated otherwise.

9.0 Earnest Money Deposit

- 9.1 The Earnest Money Deposit amount may be paid in the modes described in this Document. The **CPP-IPR** shall not pay interest on the same in any case. The bidder is responsible for timely payment of Earnest Money Deposit, so that **CPP-IPR** receives the same before stipulated date and time. Even if the payment made by the bidder within the stipulated date and time is not received by **CPP-IPR** due to reasons beyond control of the bidder, the bid will be considered as non-responsive and rejected. If the Earnest Money Deposit amount paid by bidder is less than stipulated, the bid shall be rejected.

The bidder is solely responsible for timely deposition of Earnest Money Deposit in the correct account.

- 9.2 (a) In case of two part bid, the Earnest Money Deposit of technically unqualified bidders after technical evaluation shall be returned.
- (b) Earnest Money Deposit of qualified unsuccessful bidders will be returned to them within a month (30 days) from the date of acceptance of bid of the successful bidder.
- (c) Earnest Money Deposit of successful bidder will be returned after submission of the performance guarantee amount.
- (d) Earnest Money Deposit of the bidder who has withdrawn the bid before opening shall be returned after opening of the bid.
- 9.3 The Earnest Money Deposit shall be forfeited, if;
- (a) The bidder withdraws/modifies his bid or any item thereof after opening of bid.

(b) The successful bidder fails within the specified time limit to submit the performance guarantee and commence the work.

- 9.4 The CPP-IPR at its discretion shall refund the Earnest Money Deposit by RTGS/NEFT or through any other electronic mode to the account number as registered by the bidder. Bidders are required to furnish Bank Details to CPP-IPR for the same.

10.0 Bid Prices, Rates & Taxes

10.1 The bidder should quote his rates in figures & words both.

10.2 In the case of item rate tenders, only rates quoted shall be considered.

10.3 The rates, prices and total bid price submitted by the contractor shall be inclusive of terminal or other duties, VAT, CST, turnover tax, work contract tax, octroi, cess, or any other similar tax applicable under the existing laws or levy by the statutory authorities/state/central government in performance of this contract except service tax.

10.4 Tax Deduction at Source

At the time of its payments due to the contractor under this contract, the statutory deduction of income tax at source (IT TDS) shall be made from time to time as may be required.

CPP-IPR shall provide the necessary withholding tax certificates to the contractor within the time stipulated by the relevant law to enable the contractor to file the same with the government.

10.5 The evaluation of price bid will be done strictly on the basis of rates quoted by bidder in the price bid format plus service tax as applicable.

11.0 Currencies of Bid and Payment

11.1 The unit rates and the prices shall be quoted by the bidder in Indian rupees, unless otherwise specified in the special conditions of contract.

12.0 Bid Validity

12.1 The bids submitted shall remain valid for acceptance for a period of **120 days** from the date of opening of the bid. The bidder shall not be entitled during the period of validity, to revoke or cancel his bid or vary/modify the bid given or any item thereof. In case of bidder revoking or canceling his bid, varying any terms in regard thereof, the full amount of Earnest Money Deposit paid by the bidder along with the bid shall be forfeited by **CPP-IPR**.

12.2 In exceptional circumstances, prior to expiry of the original bid validity period, CPP-IPR may request the bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting its Earnest Money Deposit but his bid will not be considered. A bidder agreeing to the request will not be required or permitted to modify its bid, but will be required to extend the validity of its Earnest Money Deposit for the period of the extension.

13.0 Alternative Proposals by Bidders

13.1 Bidders shall submit offers that comply with the requirements of the bidding documents, including the basic technical design as indicated in the drawing and specifications. Alternatives will not be considered.

14.0 Submission of the Bids

14.1 The date and time of bid submission shall remain unaltered even if the specified date for the submission of the bid is declared as holiday for the office inviting tender.

14.2 **CPP-IPR** may extend the deadline for submission of bids by issuing an amendment, in which case, all rights and obligations of the corporation and the bidders previously subject to the original deadline will then be subject to the new deadline.

14.3 Any bid received by **CPP-IPR** after the deadline prescribed above will be rejected.

15.0 Bid Opening

15.1 Tender opening shall be done at CPP-IPR. If the date of opening is declared as holiday then bid will be opened on next working day. In exceptional cases opening of tenders can be done on any day or time after scheduled date and time of opening. Corrigendum issued for opening of tender shall be uploaded on website.

15.2 The bids without stipulated Earnest Money Deposit amount and other mandatory documents as per NIT shall be summarily rejected.

15.3 In two part tenders financial bid of only qualified bidder shall be opened.

16.0 Clarification of Bids

16.1 To assist in the examination and comparison of bids, the CPP-IPR may, at its discretion, ask any bidder for clarification of his bid, including breakdown of unit rates. The request for clarification and

the response shall be in writing or by email/fax, but no change in the price or substance of the bid shall be sought, offered, or permitted. If the bidder does not respond within the stipulated time, then the bid of the bidder will be evaluated on its own merit.

- 16.2 Bidder shall not contact **CPP-IPR** on any matter relating to his bid from the time of the bid opening to the time the contract is awarded.
- 16.3 Any effort by the bidder to influence **CPP-IPR** bid evaluation, bid comparison or contract award decisions, may result in the rejection of his bid.

17.0 Examination of Bids and Determination of Responsiveness

- 17.1 Prior to detailed evaluation of bids, **CPP-IPR** will determine whether each bid(s) meets (a) the minimum requirements as per pre-qualification criteria (b) is accompanied by the required Earnest Money Deposit (c) is responsive to the requirements of the bidding documents (d) has been properly signed by authorized signatory.
- 17.2 A responsive bid is one which conforms to all the terms, conditions and specification of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial change in scope, quality or performance of the works; (b) which limits in any substantial way, the **CPP-IPR**'s rights or the bidder's obligations under the contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting responsive bids.

18.0 Notification of Award and Signing of Agreement

- 18.1 The bidder whose bid has been accepted will be notified of the award by the **CPP-IPR** prior to expiration of the bid validity period by issue of work order. The notification may also be made through letter of intent, wherein the work order shall follow.
- 18.2 The details of award can be seen on web site. The bidders can request for debriefing in writing within fifteen days of award. They shall be informed about suitable days to visit the office of the concerned officer. Requests beyond deadline shall not be entertained.
- 18.3 An agreement shall be made and signed by both the parties. The agreement will incorporate all correspondence between **CPP-IPR** and the successful bidder, bid documents etc. The bid documents as uploaded on the web site will be forming a part of the agreement. The successful bidder shall be responsible for compliance at his own cost with the stamp duty act of the state where the agreement is being executed. The non-judicial stamp paper of appropriate value after adjudication shall be submitted by the successful bidder at his own cost.

19.0 Corrupt or Fraudulent Practices

19.1 **CPP-IPR** requires that bidders/suppliers/contractors under this contract, observe the highest standard of ethics during the procurement and execution of this contract. In pursuance of this policy, **CPP-IPR**:

- (a) Defines, for the purpose of these provisions, the terms set forth below as follows:
 - (i) “corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
 - (ii) “fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the **CPP-IPR**, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive **CPP-IPR** of the benefits of free and open competition.
- (b) Will reject a proposal for award of work if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.
- (c) Will declare a bidder ineligible, either indefinitely or for a stated period of time, to be awarded a contract/contracts if at any time it determines that the bidder has engaged in corrupt or fraudulent practices in competing for, or in executing, the contract.

19.2 The bidder may make representation in connection with processing of tender directly and only to the competent authority (calling tender) as mentioned in the tender document. However, if such representation is found to be un-sustentative and/or frivolous and if the tender has to be closed because of the delays/disruptions caused by such representations and the job has to be re-tendered, then such bidder will not be allowed to participate in the re-invited tender.

In case, any bidder while making such representation to competent authority also involves other officials of **CPP-IPR** and/or solicits/invokes external intervention other than as may be permitted under the law and if the tender has to be closed because of the delays/disruptions caused by such interventions and has to be re-tendered, then the particular bidder will not be allowed to participate in the re-invited tender.

20.0 Disclosures

21.1 Any change in the constitution of the contractor’s firm, where it is a partnership firm, joint venture or consortium partnerships as declared in the bid should be disclosed to **CPP-IPR**, at any time between the submission of bids and the signing of the contract.

PART – B BID EVALUATION CRITERIA AND INSTRUCTION TO BIDDERS

SUBMISSION OF BIDS:

The Bid shall be submitted in the following manner in separately sealed envelopes duly super scribed:

a) PART – I: TECHNICAL BID

b) PART – II: PRICE BID

PART – I of the bid shall contain the following:

a) Documentary Proof of fulfilling Eligibility Criteria

b) Bid/Offer in hard copy as per the requirement of the Bidding Document duly signed and stamped on each page.

c) Master Index enclosed with Request for Quotation duly signed and stamped by the bidders in token of having received and read all parts of bidding documents and having accepted and considered the same in preparing and submitting the bid.

d) Earnest Money deposit as specified in Instructions to Bidders (ITB)

PART – II of the bid shall contain the following:

Bidder shall fill price in Schedule of Prices. In this part of bid, the bidder shall not stipulate any conditions. There shall not be any over writing.

REQUIREMENTS AND ELIGIBILITY CRITERIA:

The Bidders who fulfill the following requirements on their own shall only be eligible to apply. Joint ventures for this work are not accepted.

1.	<p>Should have successfully executed similar nature of Road Works in the previous seven years to be reckoned from the due date of submission of bid:</p> <ul style="list-style-type: none">i. At least one single contract having value not less than Rs. 129.19 Lakh (Rupees One Hundred Twenty Nine point One Nine Lakh Only)ORii. At least two separate contracts having value not less than Rs. 96.89 Lakh (Rupees Ninety Six point Eight Nine Lakh Only) in each case.ORiii. At least three separate contracts having value not less than Rs. 64.60 Lakh (Rupees Sixty Four point Six Lakh Only) in each case. However, of the three contracts, at least one should have been completed within the last three years reckoned from the due date of submission of bid. <p>Note:</p> <ul style="list-style-type: none">a. A copy of Work Order and Completion Certificate for each work shall be submitted.b. Cost of works shall mean gross value of the completed work excluding those materials supplied by the client free of cost.
2.	<p>Should have successfully executed similar nature of Civil Works (Residential/Public Buildings) in the previous seven years to be reckoned from the due date of submission of bid:</p> <ul style="list-style-type: none">i. At least one single contract having value not less than Rs. 232.93 Lakh (Rupees Two Hundred Thirty Two point Nine Three Lakh Only)ORii. At least two separate contracts having value not less than Rs. 174.70 Lakh (Rupees One Hundred Seventy Four point Seven Lakh Only) in each case.ORiii. At least three separate contracts having value not less than Rs. 116.46 Lakh (Rupees One Hundred Sixteen point Four Six Lakh Only) in each case. However, of the three contracts, at least one should have been completed within the last three years reckoned from the due date of submission of bid. <p>Note:</p> <ul style="list-style-type: none">a. A copy of Work Order and Completion Certificate for each work shall be submitted.b. Cost of works shall mean gross value of the completed work excluding those materials supplied by the client free of cost.

3.	Should have successfully executed at least one work (any type of construction) costing not less Rs. 100.00 Lakh (Rupees One Hundred Lakh Only) for Government / Semi Government / Government Undertaking / Autonomous Bodies of Government during the last seven years to be reckoned from the due date of submission of bid.
4.	Should have a minimum of 5 (Five) years of experience in building construction to be reckoned from the due date of submission of bid.
5.	Should have had minimum average annual turnover of Rs. 452.65 Lakh (Rupees Four Hundred Fifty Two point Six Five Lakh Only) during the last five years ending 31 st March, 2015.
6.	Should have valid minimum bank solvency of a Nationalized Bank/Scheduled Bank of Rs.181.06 Lakh (Rupees One Hundred Eighty One point Zero Six Lakh Only).
7.	Should not have incurred any loss in more than two years during the last five financial years ending on 31 st March, 2015.
8.	<p>The bidding capacity of the Bidder should be equal to or more than the cost of the work. The bidding capacity shall be worked out by the following formula:</p> <p>Bidding Capacity = (A x N x 2) - B</p> <p>Where,</p> <p>A = Maximum value of construction works executed in any one year during the last seven years. The works considered for evaluating this value shall be detailed in Form–III.</p> <p>N = Number of years prescribed for completion of work for which tender application has been invited.</p> <p>B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which tender has been invited. The works considered for evaluating this value shall be detailed in Form–IV.</p> <p>The Bidder shall work out the bidding capacity as per above procedure and Submit the same with the bid.</p>

Note:

1. Bidder to submit all documents duly attested by Gazetted Officer/Notarized towards the proof of meeting the Bid Evaluation Criteria
2. In case the audited financial report of 2014-15 is not available, the bidder has an option to submit the audited financial reports for FY 2009-10, 2010-11, 2011-12, 2012-13 and 2013-14.
3. CPP-IPR reserves the right to complete the evaluation based on the details furnished without seeking any additional information.

SUBMISSION OF ATTESTED COPIES OF CERTIFICATES/DOCUMENTARY EVIDENCES

In addition to the supporting documents for the eligibility criteria, information for the following to be submitted:

1.	List of Completed works during last 7 years ending on 31 st January 2015 (As per Form-III)
2.	List of all ongoing Works. All works of any nature in hand must be furnished. No works shall be left out. (As per Form-IV)
3.	List of construction plant, machinery, equipments, accessories & infrastructure facilities possessed by the Bidder and that proposed to complete the work in time. (As per Form-VIII)
4.	List of Administrative & Technical staff available with the Bidder and that proposed to be deployed to complete this work in time. (As per Form-VII)
5.	DOCUMENTS: A copy of the same to be submitted along with bid.
	i) PAN (Permanent Account Number) Registration
	ii) Attested copy (ies) of partnership deed (in case of partnership firm) and power of attorney.
	iii) Attested copies of all the relevant documents viz. Work Order(s), Execution Certificate(s), Annual Report / Balance Sheet and Profit & Loss Account and other documents as mentioned in Exhibit 'A'.
	iv) Attested copy of P. F. certificate

Undertaking to be submitted:

6.	Undertaking as per Form-IX of Tender document should be submitted.
	<p>The Bidder may furnish any additional information, which they think necessary to establish their capabilities to successfully complete the envisaged work. No information shall be entertained after last date of submission of tenders unless it is called by the Institute.</p> <p>Short listing of the bidders shall be subject to thorough verification of their credentials and inspection of works carried out by them (if required), through a Technical Evaluation Committee, constituted by CPP-IPR. After evaluation of applications, a list of qualified bidders shall be prepared for further opening of financial bid.</p>

	If any information furnished by the Bidder is found incorrect at a later stage, they shall be liable to be debarred from tendering/taking up of work in CPP-IPR. CPP-IPR reserves the right to verify the particulars furnished by the bidders independently and reject any application without assigning any reason.
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NOTE:

1. Prospective bidders shall satisfy themselves of fulfilling all the eligibility criteria before submission of the tender. The Institute reserves the right to not consider the tender documents of the bidders not fulfilling the stipulated criteria.
2. Bids complete in all respect must reach this office not later than 15:00 Hours on the notified date of closing of the tender.
3. The Bidder is required to submit the bid along with their covering letter under letter head disclosing the name and designation of authorized person signing the bid, complete postal address of firm/company, telephone no., fax no., e-mail, etc.
4. Bidder to submit all documents duly attested by Gazetted Officer/Notarized towards the proof of meeting the Bid Evaluation Criteria

BID EVALUATION METHODOLOGY

Bidders will be evaluated in the following manner:

- i) The **REQUIREMENTS AND ELIGIBILITY CRITERIA** prescribed in **PART – B: BID EVALUATION CRITERIA AND INSTRUCTION TO BIDDERS** will be scrutinized and the bidder's eligibility for pre-qualification determined.
- ii) The bidders qualifying the **REQUIREMENTS AND ELIGIBILITY CRITERIA** prescribed in **PART – B: BID EVALUATION CRITERIA AND INSTRUCTION TO BIDDERS** of this documents will be evaluated for the following criteria by scoring method on the basis of the following details furnished by them:

i)	Financial Strength (Form I and Form II)	:	20 Marks
ii)	Experience in similar nature of works during the last seven years (Form III)	:	20 Marks
iii)	Performance on Works (Form V) - Time Overrun	:	20 Marks
iv)	Performance on Works (Form V) - Quality	:	15 Marks
v)	Personnel and Establishment (Form VI and Form VII)	:	10 Marks
vi)	Plants and Equipments (Form VIII)	:	15 Marks
	Total	:	100 Marks

To qualify, the bidder must secure at least 50 percent marks in each and at least 60 percent marks in aggregate.

The Institute, however, reserves the right to restrict the list of pre-qualified contractors to any number deemed suitable by it.

The break –up of the above scoring method is indicated in the table below:

Sl.No.	Attributes		Evaluation				
(a)	Financial strength	(20 marks)					
	(I) Average annual turnover	16 marks	(i) 60% marks for minimum eligibility criteria				
	(II) Solvency Certificate	4 marks	(ii) 100% marks for twice the minimum eligibility criteria or more				
			In between (i) & (ii)-on prorata basis				
(b)	Experience in similar class of works	(20 marks)					
			(i) 60% marks for minimum eligibility criteria				
			(ii) 100% marks for twice the minimum eligibility criteria or more				
			In between (i) & (ii)-on prorata basis				
(c)	Performance on works (time over run=TOR)	(20 marks)					
	Parameter	Calculation for point	Score				Max Marks
		If TOR =	1.00	2.00	3.00	> 3.50	20
	(i) Without levy of compensation		20	15	10	10	
	(ii) With levy of compensation		20	5	0	- 5	
	(iii) Levy of compensation not decided		20	10	0	0	
TOR = AT /ST, where AT = Actual Time; ST = Stipulated Time							
Note : Marks for value in between the stage indicated above is to be determined by straight line variation basis.							
(d)	Performance on works (Quality)	(15 marks)					
	(i) Very Good	15					
	(ii) Good	10					
	(iii) Fair	5					
	(iv) Poor	0					

(e)	Personnel and Establishment	(Max. 10 marks)
	(i) Graduate Engineer	2marks for each Max. 6 Marks
	(ii) Diploma holder Engineer	1marks for each upto Max.3 marks
	(iii) Supervisory / Foreman	1mark for each upto Max. 1 mark
(f)	Plant & Equipment	(Max. 15 marks)
	(i) Hopper Mixer	1marks for each upto Max.2 marks
	(ii) Truck / Tippers / Transit mixer	1marks for each upto Max.2 marks
	(iii) Steel shuttering	2marks for each 800 sqm upto max 4 marks
	(iv) Tower Crane	2marks for each upto Max.4 marks
	(v) Building Hoist	1mark for each upto Max. 2 marks
	(vi) Excavator	1mark for each upto Max. 2 marks
	(vii) Batch Mix Plant	2marks for each upto Max.4 marks
	(viii) Vibrators	1mark for each upto Max. 2 marks
	(ix) Vibration Compactor	1mark for each upto Max. 2 marks
	(x) Paver Finisher	2mark for each upto Max. 4 marks
	(xi) welding equipments	2mark for each upto Max. 4 marks

- iii) Even though a bidder may satisfy the above requirements, he would be liable for disqualification if he has:
- Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the pre-qualification document.
 - Record of poor performance such as abandoning work, not properly completing the contract, or financial failures /weaknesses etc.
- iv) Institute reserves the right to reject the applications of the agencies who are not fulfilling the NIT stipulations and/or having adverse report on the works carried out by them in the past.

SHORTLISTING OF BIDDERS

Technical Evaluation Committee, constituted by the Institute shall verify the credentials submitted by the bidders and prepare preliminary evaluation reports. The Committee may inspect the works of those bidders who qualify in preliminary evaluation. The committee shall recommend the bidders for technical eligibility based on inspection of works according to the above criteria.

After completing the evaluation process a list of short listed bidders shall be prepared, who only will be eligible for further tendering process and price bid of the technically eligible parties will be opened.

NOTE: The Institute reserves the right, without being liable for any damages or obligation to inform the bidder, to:

- (a) Amend the scope and value of contract to the bidder.
- (b) Reject any or all the bidder(s) without assigning any reason.

Any effort on the part of the applicant or his agent to exercise influence or to pressurize the Institute would result in rejection of his bid. Canvassing of any kind is prohibited.

**Centre Director
Centre of Plasma Physics
Institute for Plasma Research
Nazirakhat, Tepesia, Sonapur, Kamrup (M)
Pincode – 782402
Assam, India**

NOTE:

1. Bidders are requested to fill all the Annexure as enclosed in the tender documents.
2. Bidders must sign & stamp on each page of tender document.

EXHIBIT 'A': CONFIRMATION OF BIDDERS FOR MEETING BEC AND OTHER REQUIREMENTS OF TENDER:

Sl. No.	TENDER REQUIREMENT	BIDDER'S REPLY / CONFIRMATION
1.	<p>Should have successfully executed similar nature of Road Works in the previous seven years to be reckoned from the due date of submission of bid:</p> <p>At least one single contract having value not less than Rs. 129.19 Lakh (Rupees One Hundred Twenty Nine point One Nine Lakh Only)</p> <p align="center">OR</p> <p>At least two separate contracts having value not less than Rs. 96.89 Lakh (Rupees Ninety Six point Eight Nine Lakh Only) in each case.</p> <p align="center">OR</p> <p>At least three separate contracts having value not less than Rs. 64.60 Lakh (Rupees Sixty Four point Six Lakh Only) in each case. However, of the three contracts, at least one should have been completed within the last three years reckoned from the due date of submission of bid.</p> <p>Note:</p> <p>a. A copy of Work Order and Completion Certificate for each work shall be submitted.</p> <p>b. Cost of works shall mean gross value of the completed work excluding those materials supplied by the client free of cost.</p>	<p>Reference of attested copies of documents furnished:</p> <p>1.</p> <p>2.</p>
2.	<p>Should have successfully executed similar nature of Civil Works (Residential/Public Buildings) in the previous seven years to be reckoned from the due date of submission of bid:</p>	<p>Reference of attested copies of documents furnished:</p>

	<p>At least one single contract having value not less than Rs. 232.93 Lakh (Rupees Two Hundred Thirty Two point Nine Three Lakh Only)</p> <p>OR</p> <p>At least two separate contracts having value not less than Rs. 174.70 Lakh (Rupees One Hundred Seventy Four point Seven Lakh Only) in each case.</p> <p>OR</p> <p>At least three separate contracts having value not less than Rs. 116.46 Lakh (Rupees One Hundred Sixteen point Four Six Lakh Only) in each case. However, of the three contracts, at least one should have been completed within the last three years reckoned from the due date of submission of bid.</p> <p>Note:</p> <ol style="list-style-type: none"> A copy of Work Order and Completion Certificate for each work shall be submitted. Cost of works shall mean gross value of the completed work excluding those materials supplied by the client free of cost. 	<p>1.</p> <p>2.</p>
3.	Should have successfully executed at least one work (any type of construction) costing not less Rs. 100.00 Lakh (Rupees One Hundred Lakh Only) for Government / Semi Government / Government Undertaking / Autonomous Bodies of Government during the last seven years to be reckoned from the due date of submission of bid.	<p>Reference of attested copies of documents furnished:</p> <p>1.</p>
4.	Should have a minimum of 5 (Five) years of experience in building construction to be reckoned from the due date of submission of bid.	<p>Reference of attested copies of documents furnished:</p> <p>1.</p>

5.	Should have had minimum average annual turnover of Rs. 452.65 Lakh (Rupees Four Hundred Fifty Two point Six Five Lakh Only) during the last five years ending 31 st March, 2015.	Reference of attested copies of documents furnished: 1.
6.	Should not have incurred any loss in more than two years during the last five financial years ending on 31 st March 2015.	Reference of attested copies of documents furnished: 1.
7.	The Bidding Capacity of the bidder should be equal to more than the cost of the work. For details, refer to 'Requirements and Eligibility Criteria'.	Reference of attested copies of documents furnished: 1.
6.	Should have valid minimum bank solvency of a Nationalized Bank/Scheduled Bank of Rs.181.06 Lakh (Rupees One Hundred Eighty One point Zero Six Lakh Only).	Reference of attested copies of documents furnished: 1.
7.	The bidder should have a valid E.P.F. Registration No. / Certificate and copy (duly attested) of the same should be submitted along with their un-priced offer at the time of submission of bid.	Reference of attested copies of documents furnished: 1.
8.	Power of Attorney in favour of person who has signed the offer in stamp paper of appropriate value.	
9.	Undertaking as per FORM-IX.	
10.	Attested copy of PAN card.	

Note:

Please note that the documents listed by you above only shall be considered for evaluation of your claim of meeting Bidder Evaluation Criteria & other requirements of the tender. Any other documents, not included above shall not be considered. Further please note that all the documents submitted should be attested by a Gazetted officer/Notarized.

Date:

Bidder's signature _____

CHECK LIST FOR SUBMISSION OF DOCUMENTS

Bidder is requested to fill this check list and ensure that all detail / documents have been furnished as called for in the Bidding Document along with duly filled in, signed & stamped checklist with each copy of the “Technical Bid (Part-I)”.

Please tick the box and ensure compliance:

Sl. No.	DETAILS OF DOCUMENTS	BIDDER'S CONFIRMATION
01	EMD OF REQUISITE AMOUNT IS SUBMITTED IN THE FORM OF DD/BG FROM ANY SCHEDULED BANK AS MENTIONED IN REQUEST FOR QUOTATION.	<div>EITHER DEMAND DRAFT</div> <div>DD NO.</div> <div>DATED:</div> <div>DRAWN ON:</div> <div>OR BANK GUARANTEE</div> <div>BG NO.</div> <div>DATED:</div> <div>VALID UPTO:</div>
02	SUBMISSION OF DOCUMENTS AS PER EXHIBIT 'A' DULY FILLED	
03	VALIDITY OF OFFER IS UP TO 04 (FOUR) MONTHS FROM THE DATE OF SUBMISSION OF TECHNICAL BID (PART-I)	YES VALID UP TO:
04	POWER OF ATTORNEY IN FAVOUR OF PERSON WHO HAS SIGNED THE OFFER IN STAMP PAPER OF APPROPRIATE VALUE	
05	PARTNERSHIP DEED IN CASE OF PARTNERSHIP FIRM AND ARTICLES OF ASSOCIATION IN CASE OF LIMITED COMPANY.	
06	COPY OF THE P.F. REGISTRATION CERTIFICATE ISSUED BY THE P.F. AUTHORITIES	YES EPF REGISTRATION NO.
07	ORIGINAL BIDDING DOCUMENT ALONG WITH BLANK (UN-PRICED) COPY (2 NOS.) OF PRICE BID (SCHEDULE OF RATES) AND ADDENDUM, IF ANY	
08	UNDERTAKING AS PER FORM-IX	

09	ALL PAGES / DOCUMENTS ARE STAMPED AND SIGNED BY THE AUTHORIZED SIGNATORY OF THE BIDDER TOWARDS ACCEPTANCE OF TERMS AND CONDITIONS OF THE TENDER	
10	COPY OF PAN CARD DULY ATTESTED	

SIGNATURE OF BIDDER: _____

NAME OF BIDDER: _____

COMPANY SEAL: _____

FORM - I

FINANCIAL INFORMATION

- I. Financial Analysis** - Details to be furnished duly supported by figures in balance sheet/ profit and loss account for the last five years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (copies to be scanned & uploaded).

Particulars	Financial Year					
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-2015
i) Gross Annual turnover on construction work						
ii) Profit/Loss						
iii) Certified by						

- II. Financial arrangements for carrying out the proposed work.**

III. The following certificates are Submitted:

- (a) Profit & Loss account certified by CA & as submitted to Income Tax Department.
- (b) Solvency Certificate from banker's of bidder in the Form 'II'.

Signature of Chartered Accountant with seal

- * For submission of annual reports, the last five years cover the FY 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15. In case the audited financial report of 2014-15 is not available, the bidder has an option to submit the audited financial reports for FY 2009-10, 2010-11, 2011-12, 2012-13 and 2013-14.

FORM – II

FORM OF BANKER'S CERTIFICATE FROM A SCHEDULED BANK

This is to certify to the best of our knowledge and information that M/s. _____
_____ (with address)
a customer of our bank are / is respectable and can be treated as good for any engagement up to a limit of
Rs. _____ (Rupees _____).

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature)

For the Bank

NOTE: (i) Bankers certificates should be on letter head of the Bank.
(ii) In case of partnership firm, certificate should include names of all partners as recorded
with the Bank.

FORM – III

DETAILS TO BE FURNISHED FOR COMPLETED WORKS DURING LAST SEVEN YEARS

Details	Work -1	Work -2
Project Name and Location			
Owner or client: (Name and Address, contact Number of Officer to whom reference can be made)			
Project description: 1. Type of Building: 2. Built Up Area (in sq. mts): 3. Number of Floors: 4. Type of Structure Load bearing/RCC/Steel: 5. Information to illustrate the attention to detail construction quality (close up photographs):			
Whether For Government / Semi Government / Government undertaking / Government autonomous bodies:			
Tendered Project Cost:			
Actual Project Cost:			
Actual Cost with breakup of Utilities Works such as HVAC, Electrical, Fire Protection etc. (Excluding civil & Structural Works)			
Structural Steel Fabrication Work (in Tons)			
Project duration (as per contract): (in months)			
Start date (dd/mm/yy):			
Actual date of Completion (dd/mm/yy):			
Actual duration (Months):			
Reasons for delay (if any):			
Any penalty/ Bonus:			
Any Litigation / Arbitration / claim / Dispute pending (with details of claim and award if any):			
Copy of Completion certificate & Work order received from client to be attached			

Note:

- 1) For similar completed works, Original or attested scanned copies of initial work order and final completion certificate from client have to be submitted along with the document.
- 2) The final completion certificate shall mention Name of work, Work order value, Completion value, duration, Client name & Address, Location of work, Stipulated start and completion date, Actual Start and Completion date, Reasons for Delay (if any), Nature of Work etc.
- 3) Attach Photographs of the projects.
- 4) Applicant should submit separate form for giving details of work completed for each year, separate sheets if any shall be numbered in sequence.
- 5) Certified that the above list of work complete and no work has been left-out and the information given is correct to knowledge and belief.

FORM – IV
INFORMATION ABOUT All ONGOING WORKS

Details	Work -1	Work -2
a) Project name & Location :			
b) Owner or client: (Name and Address, contact Number of Officer to whom reference can be made):			
c) Project details in brief:			
d) Stipulated start date :			
e) Actual Start date :			
f) Time period :			
g) Stipulated completion date :			
h) Present Status of work in Percentage completion:			
i) Work Order Value (in lakhs):			
j) Work done value (RA bill) of work (in lakhs):			
k) Type/nature of works details.			
l) slow progress if any and Reasons for Delay, if any:			
m) Copy of Work order received from client to be attached			

Note:

- 1) Original or attested scanned copies as well as hardcopies of initial work order from client have to be uploaded.
- 2) The certificate shall mention Name of work, Work order value, duration, Client name & Address, Location of work, Stipulated start and completion date, Actual Start and Completion date, Reasons for Delay (if any), Nature of Work etc.
- 3) Attach Photographs of the projects.
- 4) Certified that the above list of work is complete and no work has been left-out and the information given is correct to knowledge and belief.

FORM – V

**PERFORMANCE REPORT OF WORKS REFERRED TO IN FORM III & FORM IV
(Separate certificate for each work/ Project)**

1. Name of work/Project & Location
2. Client / Owner Name and Address:
3. Agreement No.
4. Estimated Cost
5. Tendered Cost (Work Order Value)
6. Stipulated date of start :
7. Actual date of start :
8. Date of completion
 - (i) Stipulated date of completion
 - (ii) Actual date of completion
 - (iii) Present position of work, if in progress.
9. Completion Value / Work done value till date:
10. Amount of compensation levied for delayed completion, if any.
11. Amount of reduced rate items, if any.

12. Performance Report.

- | | |
|---------------------------|--------------------------|
| (1) Quality of work | Very Good/Good/Fair/Poor |
| (2) Financial soundness | Very Good/Good/Fair/Poor |
| (3) Technical Proficiency | Very Good/Good/Fair/Poor |
| (4) Resourcefulness | Very Good/Good/Fair/Poor |
| (5) General behavior | Very Good/Good/Fair/Poor |
| (6) Time Consciousness | Very Good/Good/Fair/Poor |

Dated:

Owner or Executive Engineer or equivalent

Signature with Seal

FORM – VI
INFORMATION ABOUT ORGANISATION STRUCTURE

Sr.	Particulars	Details to be filled
1	Name of Firm	
2	Postal Address	
3	Contact Nos.	
	Office	
	Residence	
	Mobile	
4	Fax No.	
5	Name of Contact Person	
6	E – mail Address	
7	Legal status of applicant : (Please tick and attach attasted copies of original document defining the legal status)	(1) An Individual (2) A Proprietary firm (3) A Partnership firm (4) A Pvt. Ltd. Company (5) A Public ltd. Company or Corporation
8	Particulars of registration with various Government bodies (scanned & uploaded photocopy)	Dept. / Organization & Place of registration, Registration No. 1. 2.
9	Names and Titles of Director & Officers with designation proposed to be concerned with this work	
10	Designation of individuals authorized to act for the organization.	
11	Was the applicant ever required to suspend construction for a period of more than six months continuously after you commenced the construction? If so, give the name of the project and reasons of suspension of work.	
12	Has the applicant or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.	
13	Has the bidder, or any constituent partner in case of partnership firm, ever been debarred / black listed for tendering in any organization at any time? If so give details.	
14	Has the bidder or any constituent partner in case of partnership firm, ever been convicted by a court of law? If so, give details.	
15	In which fields of Engineering construction the applicant has specialization and interest?	
16	Any other information considered necessary but not included above.	

Note: Bidder should attach separate sheets if required and if space given in the formats is not sufficient but strictly as per above formats only.

FORM – VIII

INFORMATION ABOUT CONSTRUCTION PLANT, MACHINERY, EQUIPMENTS, ACCESSORIES & INFRASTRUCTURE FACILITIES POSSESSED BY THE APPLICANT AND THAT PROPOSED TO COMPLETE THE WORK IN TIME

Sr. No	Name of Equipment / Plant	Nos	Capacity or Type & make	Age	Condition	Ownership status				Current Location	How many Proposed for the Project	Remarks
						Presently owned	Leased	To be purchased	Proposed to be hired			
1	2	3	4	5	6	7	8	9	10	11	12	13
1	<u>Earth moving equipment</u> Excavators(various sizes)											
2	<u>Equipment for hoisting</u> 1.Tower crane 2. Builders hoist											
3	<u>Equipment for concrete work</u> 1 Concrete batching plant 2.Concrete pump 3.Concrete transit mixer 4.Concrete mixer (diesel) 5.Concrete mixer (elect.) 6.Needle vibrator (elect.) 7.Needle vibrator(petrol) 8.Needlevibrator (elect/petrol) 9. Curing pumps (various capacities)											
4	<u>Equipment for building work</u> 1. Block making machine 2. Bar bending machine 3. Bar cutting machine 4. Wood thickness planers 5. Drilling machine 6. Circular saw machine 7. Welding generators 8. Welding transformers 9. Welding testing equipments. 10.Welding Machines											

	11. Soil Compressor 12. M.S. pipes 13. Steel shuttering 14. Steel scaffolding 15. Grinding/Polishing machines											
5	<u>Testing Equipments</u> 1. Cube Testing 2. Sieve analysis 3. Ultrasonic test 4. Silt test 5. Micron gauger 6. Moisture Metre 7. Any other											
6	<u>Equipment for road work</u> 1. Road rollers 2. Bitumen paver finishers 3. Hot mix plant / Wet mix Plant 4. Spreaders 5. Earth rammers 6. Vibratory road rollers											
7	<u>Equipment for transportation</u> 1. Tippers 2. Trucks 3. Water tankers											
8	<u>Pneumatic equipment</u> 1. Air compressors (diesel) 2. Air Compressors (Elect)											
9	<u>Dewatering equipment</u> 1. Pump (diesel) 2. Pump (electric)											
10	<u>Power equipment</u> 1. Diesel generators											
11	<u>Equipment for Piling works</u> 1. Hydraulic piling rig 2. Piling rigs											
12	<u>Any other plants/equipments</u>											

FORM – IX
UNDERTAKING TO BE FURNISHED BY THE BIDDER

TO BE SUBMITTED BY THE BIDDER ON THEIR LETTER HEAD AFTER SIGNING THIS TEMPLATE (UNDERTAKING)

Name of Work: Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402

Tender number:

I DO HEREBY UNDERTAKE

- 1 That all the information being submitted by me is genuine, authentic, true and valid on the date of submission of tender and if any information is found to be false at any stage of tendering or contract period, I will be liable to the penal actions.
- 2 That I accept all terms and conditions of NIT, including general terms and conditions, special/additional terms and conditions, addendum, corrigendum, clarifications as stated there in the tender document as available on the website.
- 3
 - Affidavit (on non-judicial stamp paper) duly notarized, to the effect “that the documents submitted by me are true and genuine and in case of any discrepancy noticed or observed at any stage, I shall be personally responsible not only for the damages or loss to CPP-IPR, but also for criminal proceedings under the relevant laws”.
 - An undertaking (by the bidders who quote by downloading the tender from web site) on their letter head stating that “The contents of the Tender Document have not been modified or altered by M/s (Name of the bidder with complete address). In case, it is found that the tender document has been modified / altered by the bidder, the bid submitted by the M/s (Name of the bidder) shall be liable for rejection”.
- 4 That I do authorize CPP- IPR for seeking information/clarification from bankers, clients having reference in this bid.
- 5 That I have submitted photo copies of all relevant documents as prescribed in the tender document in support of the information and data furnished by me.
- 6 That I accept all the undertakings as specified elsewhere in the tender document.

- 7 That this agreement will be a part of my bid and if the work is awarded to me/us, this will be a part of our agreement with the Institute.
- 8 That I hereby forward the Earnest Money Deposit as prescribed in the tender document. If I/we fail to furnish the prescribed performance guarantee within the prescribed period, I/we agree with the condition that the earnest money will be forfeited. Further, if I/we fail to commence work as specified, I/we agree that the said earnest money will be forfeited. I/we agree that the said earnest money shall be retained by the Institute towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I/We agree that in case of forfeiture of Earnest money & Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.
- 9 I/We undertake and confirm that similar work(s) has/have not been executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of the Institute, then I/We shall be debarred for tendering in The Institute in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

Signature of Bidder with Seal

PART-C SCOPE AND LOCATION OF WORK

LOCATION OF WORK:

This work i.e. **“Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification”** has to be carried out at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402.

Temporary approaches / roads, if required, to have access to all the areas, shall be provided by the contractor at his own cost.

The tenderers are advised to visit the site of work with the prior permission of Dept., to acquaint themselves with the access to the site, location of work, labour requirement and availability, etc., and any other situations relating to availability and carriage of construction materials, etc.

The contractor carrying out this work shall strictly abide by State regulations as well as any security regulations imposed by the Department/Police Authorities/Local Authorities, from time to time, regarding transshipment of equipments, operations, drainage, security etc., wherever applicable.

SCOPE OF WORK:

As mentioned in Tender Documents (Technical Bid including Technical Specifications and Price Bid)

SECTION 2: ITEM RATE TENDER & CONTRACT FOR WORKS

	Name of work	Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402 Tender No.
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TENDER

I / We have read and examined the Notice Inviting Tender, Bid Evaluation Criteria and Instruction to Bidders, Scope and Location of Work, Technical specifications, Drawings and Designs, General Rules & Directions, General Clauses of Contract, Special Clauses of Contract & other documents and rules referred to in the Conditions and Clauses of Contract and all other contents in the tender documents for the work.

I / We, hereby tender for the execution of the work specified within the time specified in Schedule “F”, viz., Schedule of Quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule 1 of General Rules & Directions and in Clause - 11 of the General Clauses of Contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for **one hundred twenty (120) days** from the date of submission of Tender and not to make any modifications in its terms and conditions.

A sum of **Rs. 9,05,300.00** is hereby forwarded towards Earnest Money prescribed in the tender drawn from a nationalized bank in favour of **INSTITUTE FOR PLASMA RESEARCH, A/C CPP, PAYABLE AT SONAPUR.**

Consequent to the award of the subject work, if I / we, fail to furnish the prescribed performance guarantee within prescribed period, I / we agree that CPP-IPR shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I / we fail to commence work as specified, I / we agree that CPP-IPR shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise said earnest money shall be retained by CPP-IPR towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule “F” and those in excess of that limit at the rates

to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I / We agree that in case of forfeiture of earnest money or both Earnest Money & Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

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

I / We hereby declare that I / We shall treat the tender documents, drawings and other records connected with the work as secret / confidential documents and shall not communicate information derived therefrom to any person other than a person to whom I / We am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Signature of Bidder
Postal Address

Dated
Witness
Address
Occupation

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of Rs. 9,05,300.00 (Rupees Nine Lakh Five Thousand Three Hundred Only).

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

- i)
- ii)

Signature
Centre Director
Centre of Plasma Physics - Institute for Plasma Research
Dated

SECTION 3

CONDITIONS & CLAUSES OF CONTRACT

General Guidelines

- 1. This “General Conditions of Contract” is applicable for Item Rate Tenders.**
- 2. Schedule ‘A’ to ‘F’, Additional Conditions of contract, Special Conditions of contract, Specifications and Drawings is provided separately. This GCC shall form part the Agreement to be drawn and signed by both the parties after acceptance of tender.**
- 3. All Blanks are confined to Notice Inviting Tender and Schedule A to F and duly filled Schedule A to F is attached.**
- 4. The intending bidders will quote their rates in Schedule A (Price Bid).**

General Rules & Directions

1. All work proposed for execution by contract will be notified in a form of invitation to tender posted in public places and signed by the officer inviting tender or by a publication in news papers as the case may be. This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the Security and Performance guarantee Deposit to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.
2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of attorney authorizing him to do so such power of attorney to be produced with the tenders and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.
3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.
4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, may be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes.

The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by Ignoring fifty paise and considering more than fifty paise as rupee one.

In case the lowest tendered amount (worked out on the basis of quoted rate of individual items) of two or more contractors is same, then such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections /sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections /sub heads should not be higher than their respective original rate quoted already at the time of submission tender. The lowest tender shall be decided on the basis of revised offer.

If the revised tendered amount (worked out on the basis of quoted rate of individual items) of two or more contractor received in revised offer is again found to be equal, then the lowest tender, among such contractors, shall be decided by draw of lots, in the presence of Centre Director, of major and minor component(s) and the lowest contractors those have quoted equal amount of their tenders.

In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted already at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50 % of his earnest money shall be forfeited.

In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

Contractors, those whose earnest money is forfeited because of non-submission of revised offer or quoting higher revised rate(s) of any item (S) than their respective original rates quoted already at the time of submission of bid shall not be allowed to participate in the retendering process of work.

5. The officer inviting tender or his duly authorized assistant, will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money forwarded therewith shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents. In the event of a tender being rejected, the earnest money forwarded with such unaccepted tender shall thereupon be returned to the contractor remitting the same, without any interest.
6. The Centre Director shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgment or payment to the officer inviting tender and the contractor shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorized Cashier.
8. The memorandum of work tendered for and the schedule of materials to be supplied by the Institute and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.
9. The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents, drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.
- 9A. Use of correcting fluid, anywhere in tender document is not permitted. Such tender is liable for rejection.
10. In the Item Rate Tenders, only rates quoted shall be considered. Any tender containing item percentage below/above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally and the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount in event of no rate has been quoted for any item(s), leaving space both in figure(s), word(s) and amount blank, it will be presumed that the contractor has included the cost of this /these item(s) in other items and rate for such item(s) will be considered zero and the work will be required to be executed accordingly.
11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and

the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs.' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs 2.15 P' and in case of words, the word, 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.

13. (i) The Contractor whose tender is accepted will be required to furnish **performance guarantee of 5%** (Five Percent) of the tendered amount within the period specified in Schedule F. in the form of Demand Draft / Banker's Cheque of any Nationalized Bank or ICICI / IDBI / Axis / HDFC Bank in accordance with the prescribed form.
- (ii) The contractor whose tender is accepted, will also be required to furnish by way of **Security Deposit** for the fulfillment of his contract, an amount equal to **2.5%** of the tendered value of the work. The Security deposit will be collected by deductions from the running bills as well as of the contractor at the rates mentioned above. Demand Draft / Banker's Cheque of Scheduled Bank or ICICI / IDBI / Axis / HDFC Bank will also be accepted for this purpose provided confirmatory advice is enclosed.
14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Centre Director or his authorized personnel shall be communicated in writing to the Centre Director.
15. Sales-tax/VAT(except service tax), purchase tax, turnover tax or any other tax applicable in respect of this contract shall be payable by the Contractor and Institute will not entertain any claim whatsoever in respect of the same. However in respect of service tax , same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Centre Director or his authorized personnel after satisfying that it has been actually and genuinely paid by the contractor.
16. The contractor shall give a list of CPP-IPR employees related to him.
17. The tender for the work shall not be witnessed by a contractor or contractors who himself / themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
18. The tender for composite work includes in addition to building work all other works such as sanitary and water supply installations drainage installation, electrical work, roads and paths etc. The tenderer apart from being a registered contractor of appropriate class, must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage and electrical works in the composite tender.
19. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Centre Director may in his discretion, without prejudice to any other right or remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

CONDITIONS OF CONTRACT

Definitions

1. The **Contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between Competent Authority on behalf of the Centre Director, CPP-IPR and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Centre Director or his authorized personnel and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.
2. In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:
 - (i) The expression **works or work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
 - (ii) The **Site** shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - (iii) The **Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons comprising such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
 - (iv) The **Centre Director** means Centre Director, CPP-IPR, Nazirakhat, Sonapur, Assam.
 - (v) The **Engineer-in-Charge** means the Engineer or Officer authorized by the Centre Director to supervise the work, check and verify measurement of work done and bills for payment.
 - (vi) **Department / Institute** shall mean CPP-IPR.
 - (vii) **Accepting Authority** shall mean the authority mentioned in Schedule 'F'.
 - (viii) **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, military or usurped power, any acts of the Institute/Government, damages from air-crafts, acts of God, such as earth-quake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by the Institute of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Institute's faulty design of works.
 - (ix) **Market Rate** shall be rate as decided by the Centre Director or his authorized personnel on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover, all overheads and profits.
 - (x) **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the Schedule of Rates mentioned in Schedule 'F' hereunder, with the amendments thereto issued up to the date of receipt of the tender by concerned competent authority.

- (xi) **District Specifications** means the specifications followed by the State Government in the area where the work is to be executed, provided that this is specifically mentioned in Schedule “F” of the tender.
- (xii) **Tendered value** means the value of the entire work as stipulated in the letter of award.
- (xiii) **Date of commencement of work:** The date of commencement of work shall be the date of start as specified in schedule ‘F’ or the first date of handing over of the site, whichever is later, in accordance with the phasing if any, as indicated in the tender document.

Scope and Performance

- 3. Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
- 4. Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 5. The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.

Works to be carried out

- 6. The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities (Schedule-A) shall unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

Sufficiency of Tender

- 7. The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.

Discrepancies and Adjustment of Errors

- 8. The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale dimensions and special conditions in preference to General Conditions.

8.1 In the case of discrepancy between the Schedule of Quantities, the Specifications and/or the Drawings, the following order of preference shall be observed:

- i) Description of Schedule of Quantities.
- ii) Particular Specification and Special Condition, if any.
- iii) Drawings.

iv) C.P.W.D. Specifications.

v) Indian Standard Specifications of B.I.S.

8.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding Authority with regard to the intention of the document and his decision shall be final and binding on the contractor.

8.3 Any error in description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the Contract or release the Contractor from execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

Signing of Contract

9. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work sign the contract consisting of:

i) the notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

ii) Standard Form as mentioned in Schedule 'F' consisting of:

- a) Various standard clauses with corrections up to the date stipulated in Schedule 'F' along with annexure thereto.
- b) Safety Code.
- c) Model Rules for the protection of health, sanitary arrangements for workers employed by Institute or its contractors.
- d) Contractor's Labour Regulations.
- e) List of Acts and omissions for which fines can be imposed.

iii) No Payment for the work done will be made unless contract is signed by the contractor.

10. Centre Director, CPP-IPR or his authorized personnel may issue instruction/actions for the said works from time to time, which should be binding on the contractor.

GENERAL CLAUSES OF CONTRACT (GCC)

CLAUSE 1 (Performance Guarantee)

- i) The contractor shall submit an irrevocable **Performance Guarantee of 5%** (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (notwithstanding and/or without prejudice to any other provisions in the contract) within the period specified in Schedule F from the date of issue of letter of acceptance. This period can be further extended by the Centre Director or his authorized personnel up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Performance Bank Guarantee, to the satisfaction of the Centre Director or his authorized personnel. This guarantee shall be in the form of Pay order / Demand Draft /Fixed Deposit Receipt of Scheduled Bank/ Guarantee bonds of any Nationalized Bank or ICICI/ IDBI/Axis/HDFC Bank in accordance with the prescribed form annexed hereto. In case a fixed deposit receipt is furnished by the contractor to the Institute as part of the Performance Bank Guarantee and the bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Institute to make good the deficit.
- ii) The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Guarantee extended to cover such enlarged time for completion of work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest. However, in case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.
- iii) The Centre Director or his authorized personnel shall not make a claim under the performance guarantee except for amounts to which the Director, IPR is entitled under the contract (notwithstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
 - a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Centre Director or his authorized personnel may claim the full amount of the Performance Guarantee.
 - b) Failure by the contractor to pay the Centre Director any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by the Centre Director or his authorized personnel.
- iv) In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Centre Director.

CLAUSE 1A (Recovery of Security Deposit)

The person / persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit the Institute at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 2.5% of the gross amount of each running bill and final bill till the sum along with the sum already deposited as earnest money, will amount to security deposit of 2.5% of the tendered value of the work.

Such deductions will be made and held by Government by way of Security Deposit unless he /they has /have deposited the amount of Security Deposit at the rate mentioned above in the form of Demand Draft / Banker's Cheque of Scheduled Bank.

All compensations or the other sums of money payable by the contractor to institute under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by Institute on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills and final bill of the contractor at the rates mentioned above.

The security deposit as deducted above can be released against bank guarantee issued by a Nationalized bank or ICICI/ IDBI/Axis/HDFC Bank, on its accumulations to a minimum of Rs. 5 Lac subject to the condition that amount of such bank guarantee, except last one shall not be less than Rs. 5 Lac. Provided further that the validity of bank guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.

In case of contracts involving maintenance of building and services/other work, then 50% of performance Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.

CLAUSE 2 (Compensation for Delay)

If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the Government on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the Centre Director (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable) that the progress remains below that specified in Clause 5 or that the work remains incomplete.

This will also apply to items or group of items for which a separate period of completion has been specified.

Compensation for delay of work @ 1.5 % per month of delay to be computed on per day basis.

Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Institute /Government. In case, the contractor does not achieve a particular milestone mentioned in schedule F, or the re-scheduled milestone(s) in terms of Clauses 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final Grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE 2A (Incentive for early completion) (DELETED)

In case, the contractor completes the work ahead of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work X stipulated period / tendered cost), a bonus @ 1% (one per cent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in Schedule F’.

CLAUSE 3 (When Contract can be determined)

Subject to other provisions contained in this clause, Centre Director or his authorized personnel may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages, and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- (i) If the contractor having been given by the Centre Director or his authorized personnel a notice in writing to rectify; reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.
- (ii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Centre Director or his authorized personnel (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Centre Director or his authorized personnel.
- (iii) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Centre Director or his authorized personnel.
- (iv) If the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Centre Director or his authorized personnel.

- (v) If the Contractor shall offer or give or agree to give to any person in Institute or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing of forbearing to do or for having done of forborne to do any act in relation to the obtaining or execution of this or any other contract for Institute.
- (vi) If the Contractor shall enter in to a contract with Institute in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Centre Director or his authorized personnel.
- (vii) If the contractor shall obtain a contract with Institute as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.
- (viii) If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.
- (ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditors to appoint a receiver or a manager or which entitle the court to make a winding up order.
- (x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
- (xi) If the contractor assigns, transfers, sublets (engagement of labour on a piece work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with entire works or any portion thereof without the prior written approval of the Centre Director or his authorized personnel.

When the contractor has made himself liable for action under any of the cases aforesaid, the Centre Director or his authorized personnel shall have powers:

- (a) To determine the contract as aforesaid (of which termination or rescission notice in writing to the contractor under the hand of the Centre Director or his authorized personnel shall be conclusive evidence). Upon such determination or rescission, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Institute.
- (b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined or rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the Centre Director or his authorized personnel, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements /agreements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Centre Director or his authorized personnel has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 3A (Closure of Contract on Non-Commencement of Work)

In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract. Incase contractor wants close the contract, he shall give notice to the department stating the failure on the part of department. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits:

- | | | |
|-------|--|----------|
| (i) | If the Tendered value of work is upto Rs. 45 Lac: | 15 days. |
| (ii) | If the Tendered value of work is more than Rs. 45 lac and up to 2.5 Crore: | 21 days. |
| (iii) | If the Tendered Value of work is more than Rs. 2.5 Croore: | 30 days. |

If Performance Guarantee is not released within prescribed time limit, then a simple interest @ 0.25 % Per month shall be payable on Performance Guarantee amount to the contractor from the date of expiry of prescribed time limit.

A Compensation for such eventuality, on account of damages, etc. shall be payable @ 0.25% of the tendered amount subject to maximum limit of Rs. 10 Lacs.

CLAUSE 4 (Contractor Liable to pay Compensation even if action not taken under Clause 3)

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

CLAUSE 5 (Time and Extension of Delay)

The time allowed for execution of the Works as specified in the Schedule 'F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in schedule 'F' or from the date of handing over of the site

whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, Institute shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.

5.1 As soon as possible after the Contract is concluded, the Contractor shall submit a Time and Progress Chart for each milestone and get it approved by the Institute. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Centre Director or his authorized personnel and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule F.

- (a) Project Management shall be done by using Project Management software for the works costing more than Rs. 5 Crore.
- (b) The Project management shall be done using M.S. Project software for works costing more than Rs. 5 Crore and up to Rs. 20 Crore.
For works costing more than Rs.20 Crore project Management shall be done using Primavera software.

Programme Chart

- (i) The Contractor shall prepare an integrated programme chart in MS Project /Primavera software for the execution of work, showing clearly all activities from the start of work to completion with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Centre Director or his authorized personnel within ten days of award of the contract. A recovery of Rs. 2500(for works costing upto Rs. 20 Crores)/ Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission the above programme.
- (ii) The Programme Chart should include the following :
 - (a) Descriptive note explaining sequence of the various activities.
 - (b) Network (PERT/CPM/BARCHART)
 - (c) Programme for procurement of materials by the contractor.

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

- (iii) If any time , it appears to the Centre Director or his authorized personnel that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones , the contractor shall produce a revised programme within 7(seven) days, showing

the modifications to the approved programme to ensure timely completion of the work. The modified schedule of the programme shall be approved by the Engineer-in-charge. A recovery of Rs. 2500/- (for work costing upto Rs. 20 Crores)/Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of modified programme.

- (iv) The submission for approval by the Centre Director or his authorized personnel of such programme or such particulars shall not relive the contractor of any of the duties of responsibilities under the contract. This is without prejudice to the right of the Centre Director or his authorized personnel to take action against the contractors per terms and conditions of the agreement.
- (v) The contractor shall submit the progress report using MS Project /Primavira software with baseline programme referred above for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which recovery of Rs. 2500 (for works costing up to Rs. 20 Crores)/ Rs. 5000/- (for works costing more than Rs. 20Crores) shall be made on per day basis in case of delay in submission of the monthly progress report.

5.2 If the work(s) be delayed by:

- (i) force majeure, or
- (ii) abnormally bad weather, or
- (iii) serious loss or damage by fire, or
- (iv) civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
- (v) delay on the part of other contractors or tradesmen engaged by Centre Director or his authorized personnel in executing work not forming part of the Contract, or
- (vi) Non-availability of stores, which are the responsibility of Institute to supply or
- (vii) Non-availability or break down of tools and Plant to be supplied or supplied by the Institute or
- (viii) Any other cause which, in the absolute discretion of the Centre Director or his authorized personnel is beyond the Contractor's control

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the authority as indicated in Schedule F but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Centre Director or his authorized personnel to proceed with the works.

5.3 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form to the authority as indicated in Schedule F. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.4 In any such case the authority as indicated in Schedule F may give a fair and reasonable extension of time and reschedule the milestones for completion of work. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Schedule F in writing, within 3 months or Four weeks of the date of receipt of such request. Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the authority as indicated in Schedule F and this shall be binding on the contractor.

·CLAUSE 6 (Measurement of Work Done)

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value in accordance with the contract of work done.

All measurements of all the items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all the items of work performed under the contract.

All such measurements and levels shall be taken jointly by the Engineer-in-charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties,

If for any reason the contractor or his authorized representatives is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three(3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements and recording levels

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give not less than seven days notice to the Engineer-in-charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work. And if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-charge's consent being obtained in writing the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurement of any work in the measurement book and / or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or materials to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 6A (Computerized Measurement Book)

Engineer-in-charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the department so that a complete record is obtained of all the items of works performed under the contract.

All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-charge or his authorized representative. After the necessary corrections made by the Engineer-in-charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-charge for the dated signatures by the Engineer-in-charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked / test checked from the Engineer-in-Charge and/or his authorized representative. The Contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the department a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and / or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/ test checks.

The final, fair, computerized measurement given by the contractor duly bound, with its pages machine numbered should be 100% correct, and no cutting or over writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the department. Thereafter the MB shall be taken in the Divisional Office Records, and allotted a number as per the Register of Computerized MBs. This should be done before the corresponding bill is submitted to the Division office for Payment. The contractor shall submit two spare copies of such computerized MBs for the purpose of reference and record by the various officers of the department.

The contractor shall also submit to the Institute separately his computerized abstract of cost and the bill based on these measurements, duly bound and its pages machine numbered along with two spare copies of the "bill". Thereafter, this bill will be processed by the Institute and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.

The Contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements/ levels by the engineer-in-charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications,

notwithstanding any provision in the relevant standard method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the bureau of Indian standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give not less than seven days notice to the Engineer-in-charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and /or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and /or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer in charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and /or test checking measurements without such notice having been given or the engineer in charge's consent being obtained in writing the same shall be uncovered at the contractor's expense or in default thereof no payment or allowances shall be made for such work or the materials with the same was executed.

Engineer- in-charge or his authorized representative may cause either themselves or through another officer of the Institute to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and / or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 7 (Payment on Intermediate Certificate to be regarded as Advances)

No payment shall be made for work, estimated to cost Rupees Twenty thousand or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rupees Twenty thousand, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Institute in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule 'F', in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer- in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Centre Director. The amount admissible shall be paid by 10th working day after the day of presentation of the bill by the Contractor to the Centre Director together with the account of the material issued by the Institute, or dismantled materials, if any. In the case of works outside the headquarters of the Engineer- in-Charge, the period of ten working days will be extended to fifteen working days. In case of delay in payment of intermediate bills after 45 days of submission of bill by the contractor provided the bill submitted by the contractor found to be in order, a simple interest @7.5 % per

annum shall be paid to the contractor from the date of expiry of the prescribed time limit which will be compounded on yearly basis.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the Institute to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

The Centre Director in his sole discretion on the basis of a certificate from the Engineer-in-Charge to the effect that the work has been completed up to the level in question make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) up to lintel level (including sunshade etc.) and slab level, for each floor working out at 75% of the assessed value. The advance payments so allowed shall be adjusted in the subsequent interim bill by taking detailed measurements thereof.

Payments in Composite Contracts:

In case of composite tenders, running payment for the major component shall be by Engineer-In-Charge of major discipline to the main contractor. Running payment for minor components shall be recommended by the Engineer-in Charge of the discipline of minor component

In case main contractor fails to make the payment to the contractor associated by him within 15 days of receipt of each running account payment, then on the written Complaint of contractor associated for such minor component, Engineer in charge of minor component shall serve the show cause to the main contractor and if reply of main contractor either not received or found unsatisfactory, he may make the payment directly to the contractor associated for minor component as per terms and conditions of the agreement drawn between main contractor and associate contractor fixed by him, Such payment made to the associate contractor shall be recovered by Engineer-in-Charge of major or minor component from the next RA/ final bill to main contractor as the case may be.

CLAUSE 8 (Completion Certificate and Completion Plans)

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the

contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE 8 A (Contractor to keep Site Clean)

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

CLAUSE 8 B (Completion Plans to be Submitted by Contractor)

The Contractor shall submit completion plan for Electrical, water, sewerage and drainage line plan as required within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, the Institute will get it done through some other agency at his cost and actual expenses incurred plus Rs. 15000/- for the same shall be recovered from the contractor.

CLAUSE 9 (Payment of Final Bill)

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Centre Director, will, as far as possible be made within the period specified here in under, the period being reckoned from the date of receipt of the bill by the Centre director or his authorized Engineer-in-Charge, complete with account of materials issued by the Institute and dismantled materials.

- i) If the Tendered value of work is up to Rs.45 lakhs : :2 months

- ii) If the Tendered value of work exceeds Rs.45 lakhs and up to Rs.2.5 Crores: 3 months
- iii) If the Tendered value of work exceeds Rs.2.5 Crore: :6 months

In case of delay in payment of final bills after prescribed time limit, a simple interest @7.5% per annum shall be paid to the contractor from the date of expiry of prescribed time limit which will be compounded on yearly basis ,provided the final bill submitted by the contractor found to be in order.

CLAUSE 9 A (Payment of Contractor's Bills to Banks)

Payments due to the contractor may, if so desired by him, be made to his bank instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by Institute or his signature on the bill or other claim preferred against Institute before settlement by the Engineer-in-Charge of the account or claim by payment to the bank. While the receipt given by such banks shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible present his bills duly receipted and discharged through his bank.

Nothing herein contained shall operate to create in favour of the bank any rights or equities vis a-vis the Centre Director, CPP-IPR.

CLAUSE 10 (Materials Supplied by the Institute) (DELETED)

Materials which the Institute will supply are shown in Schedule 'B' which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof. The contractor shall be bound to procure them from the Engineer-in-Charge.

As soon as the work is awarded, the contractor shall finalize the programme for the completion of work as per clause 5 of this contract and shall give his estimates of materials required on the basis of drawings/or schedule of quantities of the work. The Contractor shall give in writing his requirement to the Engineer-in-Charge which shall be issued to him keeping in view the progress of work as assessed by the Engineer-in-Charge, in accordance with the agreed phased programme of work indicating monthly requirements of various materials. The contractor shall place his indent in writing for issue of such materials at least 7 days in advance of his requirement.

Such materials shall be supplied for the purpose of the contract only and the value of the materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as and when materials are consumed in items of work (including normal wastage) for which payment is being made to the contractor, from any sum then due or which may therefore become due to the contractor under the contract or otherwise or from the security deposit. At the time of submission of bills, the contractor shall certify that balance of materials supplied is available at site in original good condition.

The contractor shall submit along with every running bill (on account or interim bill) material - wise reconciliation statements supported by complete calculations reconciling total issue, total consumption and certified balance (diameter/section-wise in the case of steel) and resulting variations and reasons therefore. Engineer-in-Charge shall (whose decision shall be final and binding on the contractor) be within

his rights to follow the procedure of recovery in clause 42 at any stage of the work if reconciliation is not found to be satisfactory.

The contractor shall bear the cost of getting the material issued, loading, transporting to site, unloading, storing under cover as required, cutting assembling and joining the several parts together as necessary. Notwithstanding anything to the contrary contained in any other clause of the contract and (or the CPWA Code) all stores/materials so supplied to the contractor or procured with the assistance of the Institute shall remain the absolute property of Institute and the contractor shall be the trustee of the stores/materials, and the said stores/materials shall not be removed/disposed off from the site of the work on any account and shall be at all times open to inspection by the Engineer-in-Charge or his authorized agent. Any such stores/materials remaining unused shall be returned to the Engineer-in-Charge in as good a condition in which they were originally supplied at a place directed by him, at a place of issue or any other place specified by him as he shall require, but in case it is decided not to take back the stores/materials the contractor shall have no claim for compensation on any account of such stores/materials so supplied to him as aforesaid and not used by him or for any wastage in or damage to in such stores/materials. On being required to return the stores/materials, the contractor shall hand over the stores/ materials.

On being required to return the stores /materials , the contractor shall hand over the stores/materials on being paid or credited such price as the Engineer-in-Charge shall determine, having due regard to the condition of the stores/materials. The price allowed for credit to the contractor, however, shall be at the prevailing market rate not exceeding the amount charged to him, excluding the storage charge, if any. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to account for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to Institute for all advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach. Provided that the contractor shall in no case be entitled to any compensation or damages on account of any delay in supply or non-supply thereof all or any such materials and stores provided further that the contractor shall be bound to execute the entire work if the materials are supplied by the Institute within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months, but if a part of the materials only has been supplied within the aforesaid period, then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such extension of time as may be determined by the Engineer-in-Charge whose decision in this regard shall be final and binding on the contractor.

The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/original condition at the time of completion or determination of the contract shall be returned to the Engineer-in-Charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading, transporting. Unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue.

CLAUSE 10A (Materials to be provided by the Contractor)

The contractor shall, at his own expense, provide all materials required for the works.

The contractor shall, at his own expense and without delay, supply to the Engineer-in- Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the

contract. The contractor shall, if requested by the Engineer-in- Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials. The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in- Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.

The Contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in Schedule F.

CLAUSE 10 B

(i) Secured Advance on Non-perishable Materials

The contractor, on signing an indenture in the form to be specified by the Centre Director, shall be entitled to be paid during the progress of the execution of the work up to 90% of the assessed value of any materials which are in the opinion of the Engineer-in-Charge **nonperishable, non-fragile and noncombustible and are in accordance with the contract** and which have been brought on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered / deducted from the next payment made under any of the clause or clauses of this contract.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Centre Director shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

(ii) Mobilization Advance: (DELETED)

Mobilization advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work. Such advance shall be in two or more installments to be determined by the Centre Director at his sole discretion. The first installment of such advance shall be released by the Engineer-in-charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer-in- Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Before any installment of advance is released, the contractor shall execute a Bank Guarantee Bond of any Nationalized Bank or ICICI/ IDBI/Axis/HDFC Bank in accordance with the prescribed form for the amount of advance & valid for the contract period. This shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.

Provided always that provision of clause 10B (ii) shall be applicable only when so provided in schedule 'F'.

(iii) Interest & Recovery: (DELETED)

The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest at the rate of 10 per cent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractor's bills commencing after first ten per cent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty per cent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

- (iv)** If the circumstances are considered reasonable by the Centre Director, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended in the discretion of the Centre Director.

CLAUSE 10 C (Payment on Account of Increase in Prices/Wages due to Statutory Order(s)) (DELETED)

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes in sales tax/VAT , Central/State Excise/Custom Duty) beyond the price/wages prevailing at the time of the last stipulated date of receipt of tenders including extensions, if any, for the work during contract period including the

justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied and provided further that any such increase shall be limited to the price/wages prevailing at the time of updated stipulated date of completion considering effect of extra work (extra time to be calculated on prorated basis only as cost of extra work x stipulated period / tendered amount).

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes in sales tax/VAT Central/State Excise/Custom Duty) Institute shall in respect of materials incorporated in the works (excluding the materials covered under Clause 10CA) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge may call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages.

The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

For this purpose, the labour component of the work executed during any period under consideration shall be the percentage as specified in Schedule F, of the value of work done during that period the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

CLAUSE 10 CA (Payment due to variation in prices of materials after receipt of tender)

If after submission of the tender, the price of materials specified in Schedule F increases/decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders (including extensions, if any) for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of Contract including the justified period extended under the provisions of Clause 5 of the Contract without any action under Clause 2.

However for work done during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost).

The increase/decrease in prices of cement, steel reinforcement and structural steel and POL shall be determined by the price indices issued by the Director General (Works), CPWD. For other items provided in the Schedule 'F' shall be determined by the All India Wholesale Price Indices of Material as published by Economic Advisor to Government of India, Ministry of Commerce and Industry and base price for cement, steel reinforcement, structural steel & POL as issued under the authority of Director General

(Works) CPWD applicable for Delhi and base price of other materials issued as indicated in Schedule F as valid on the last stipulated date of receipt of tender, including extension if any and for the period under consideration. In case, price index of a particular material is not issued by the ministry of Commerce and Industry, then the price index of nearest similar material as indicated in Schedule 'F' shall be followed

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the formula given below for individual material:-

a) Adjustment for component of individual material

$$V = P \times Q \times \frac{CI - CI_0}{CI_0}$$

where,

V = Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

P = Base Price of material as issued under authority of DG(W), as indicated in Schedule 'F'.

For Projects and Original works

Q = Quantity of material brought at site for bonafide use in the works since previous bill excluding such quantity consumed in the deviated quantities of items beyond deviation limit and extra/substituted item, paid /to be paid at rates derived on the basis of market rate under clause 12.2..

CI₀ = Price index for cement, steel reinforcement bars and structural steel and POL as issued by the DG, CPWD and corresponding to the time of base price of respective material indicated in Schedule 'F'. For other items, if any, provided in Schedule 'F', All India Wholesale Price Index for the material as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce and corresponding to the time of base price of respective material indicated in Schedule 'F'.

CI = Price index for cement, steel reinforcement bars, structural steel and POL as issued under the authority of DG, CPWD for period under consideration. For other items, if any, provided in Schedule 'F' All India Wholesale Price Index for material for period under consideration as published by Economic Advisor to Institute of India, Ministry of Industry and Commerce.

Note-

- (i) In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on prorated basis only as cost of extra work x stipulated date of completion/ tendered cost) shall be considered.

Provided always that provisions of the preceding Clause 10 C shall not be applicable in respect of Materials covered in this clause.

- (ii) If during progress of work or at the time of completion of work, it is noticed that any material brought at site is in excess of requirement, then amount of escalation if paid earlier on such

excess quantity of material shall be recovered on the basis of cost indices as applied at the time of payment of escalation or as prevailing at the time of effecting recovery, whichever is higher.

- (iii) Cement mentioned wherever in this clause includes Cement component used in RMC brought at site from outside approved RMC plants, if any.
- (iv) The date wise record of ready mix concrete shall be kept in a register and the cement consumption for the same shall be calculated accordingly.
- (v) If built-up steel items are brought at site from work shop, then the variation shall be paid for the structural steel up to the period when the built up item /finished product is brought at site.

CLAUSE 10 CC (Payment due to Increase/Decrease in Prices/Wages (Excluding materials covered under clause 10 CA) after receipt of Tender for works) (DELETED)

If the prices of materials (not being materials supplied or services rendered at fixed prices by the Institute in accordance with clause 10 & 34 thereof) and/or wages of labour required for execution of the work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2. However, for the work done during the justified period extended as above, the compensation as detailed below will be limited to prices/wages prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less. No such compensation shall be payable for a work for which the stipulated period of completion is equal to or less than the time as specified in Schedule F. Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the following provisions:-

(i) The base date for working out such escalation shall be the last stipulated date of receipt of tenders including extension, if any.

(ii) The cost of work on which escalation will be payable shall be reckoned as below:

- a) Gross value of work done up to this quarter: (A)
 - b) Gross Value of work done up to the last quarter: (B)
 - c) Gross value of work done since previous quarter (A-B): (C)
 - d) Full assessed value of Secured Advance (excluding materials covered under clause 10CA) fresh paid in this quarter (D)
 - e) Full assessed value of Secured Advance (excluding materials covered under clause 10CA) recovered in this quarter: (E)
 - f) Full assessed value of Secured Advance for which escalation is payable in this quarter (D-E) : (F)
 - g) Advance payment made during this quarter: (G)
 - h) Advance payment recovered during this quarter: (H)
 - i) Advance payment for which escalation is payable in this quarter (G-H) (I)
 - j) Extra Items/deviated quantities of items paid as per Clause 12 based on prevailing market rates during this quarter: (J)
- Then, $M = C + F + I - J$
 $N = 0.85 M$
- k) Less cost of material supplied by the Institute as per Clause 10 and recovered during the quarter(K)

I) Less cost of services rendered at fixed charges as per Clause 34 and recovered during the quarter(L)

Cost of work for which escalation is applicable: $W=N-(K+L)$

(iii) Components for materials (except cement, reinforcement bars, structural steel ,POL or other materials covered under clause 10 CA) , labour, etc. shall be pre- determined for every work and incorporated in the conditions of contract attached to the tender papers included in Schedule ‘F’ The decision of the Engineer-in- Charge in working out such percentage shall be binding on the contractors.

(iv) The compensation for escalation for other materials (excluding cement, reinforcement bars, structural steel ,POL or other materials covered under clause 10 CA shall be worked as per the formula given below:

(a) Adjustment for civil component (except cement, structural steel, reinforcement bars, POL and other materials covered under clause 10CA)/electrical component of construction ‘Materials’

$$(b) V_m = W \times \frac{X_m}{100} \times \frac{MI - MI_0}{MI_0}$$

V_m =Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

W = Cost of Work done worked out as indicated in sub para (ii) of Clause 10CC

X_m = Component of ‘materials’(except cement, structural steel, reinforcement bars,POL and other materials covered under clause 10CA) expressed as percent of the total value of work

MI = All India Wholesale Price Index for civil component/electrical component* of construction material as worked out on the basis of all India wholesale price index for individual commodities/group items for the period under consideration as published by the Economic Advisor to Govt of India Ministry of Industry & Commerce and applying weightages to the individual commodities/group items. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of stipulated date of completion considering the effect of extra work (extra time to be calculated on prorated basis only as cost of extra works \times stipulated period / tendered cost , shall be considered.)

MI_0 = All India Wholesale Price Index for civil component/electrical component* of construction material as worked out on the basis of all India wholesale price index for individual commodities/group items valid on the last stipulated date of receipt of tender including extension, if any, as published by the Economic Advisor to Govt of India Ministry of Industry & Commerce and applying weightages to the individual commodities/group items.

*Note: relevant component only will be applicable.

(v) The following principles shall be followed while working out the indices mentioned in para (iv) above.

(a) The Compensation for escalation shall be worked out at quarterly intervals and shall be with respect to the cost of work done as per bills paid during the three calendar months of the said quarter . The date of preparation of bills as finally entered in measurement book by the Assistant Engineer/date of submission of bill finally by the contractor to the department in case of computerized measurement books shall be the guiding factor to decide the bills relevant to the quarterly interval. The first such

payment shall be made at the end of three months after the month (excluding the month in which tender was accepted) and thereafter at threemonths' interval . At the time of completion of work , the last period for payment might become less than 3 months , depending on the actual date of completion.

(b) The index (MI/FI etc.) relevant to any quarter /period for which such compensation is paid shall be the arithmetical average of the indices , relevant to the three calendar months . If the period up to date of completion after quarter covered by the last such installment of payment , is less than three months , the index MI and FI shall be the average of the indices for the months falling within that period.

(vi) The compensation for escalation for **labour** shall be worked out as per the formula given below:

$$VL = W \times \frac{Y}{100} \times \frac{LI - LI_0}{LI_0}$$

VL : Variation in labour cost i.e. amount of increase or decrease in rupees to be paid or recovered.

W=Value of work done, worked out as indicated in sub-para (ii) above.

Y : Component of labour expressed as a percentage of the total value of the work.

LI: Minimum wage in rupees of an unskilled adult male mazdoor fixed under any law, statutory rule or order as applicable on the last date of the quarter previous to the one under consideration. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the minimum wage prevailing on the last date of quarter previous to the quarter pertaining to updated stipulated date of completion considering effect of extra work (extra time to be calculated on prorate basis only as cost of extra work x stipulated period / tendered cost , shall be considered.)

LI₀= Minimum daily wage in rupees of an unskilled adult male mazdoor, fixed under any law, statutory rule or order as on the last stipulated date of receipt of tender including extension, if any.

(vii) The following principles will be followed while working out the compensation as per sub-para (vi) above.

- (a) The minimum wage of an unskilled male mazdoor mentioned in sub-para (vi) above shall be the higher of the wage notified by Government of India, Ministry of Labour and that notified by the local administration both relevant to the place of work and the period of reckoning.
- (b) The escalation for labour also shall be paid at the same quarterly intervals when escalation due to increase in cost of materials and/or P.O.L. is paid under this clause. If such revision of minimum wages takes place during any such quarterly intervals, the escalation compensation shall be payable at revised rates only for work done in subsequent quarters.
- (c) Irrespective of variations in minimum wages of any category of labour, for the purpose of this clause, the variation in the rate for an unskilled adult male mazdoor alone shall form the basis for working out the escalation compensation payable on the labour component.

(viii) In the event the price of materials and/or wages of labour required for execution of the work decrease/s, there shall be a downward adjustment of the cost of work so that such price of materials and/or wages of labour shall be deductible from the cost of work under this contract and in this regard the formula herein before stated under this Clause 10CC shall mutatis mutandis apply, provided that:

- (a) no such adjustment for the decrease in the price of materials and/or wages of labour aforementioned would be made in case of contracts in which the stipulated period of completion of the work is equal to or less than the time as specified in Schedule „F.
- (b) The Engineer-in-Charge shall otherwise be entitled to lay down the procedure by which the provision of this sub-clause shall be implemented from time to time and the decision of the Engineer-in-Charge in this behalf shall be final and binding on the contractor.

(ix) Provided always that:-

- (a) where provisions of clause 10CC are applicable provisions of clause 10C will not be applicable but provisions of clause 10 CA will be applicable.
- (b) Where provisions of Clause 10CC are not applicable, provisions of clause 10C and 10 CA will become applicable.

Note: Updated stipulated date of completion (period of completion plus extra time for extra work for compensation under clause 10 C , 10 CA and 10 CC , the factor of 1.25 taken in to account for calculating the extra item under clause 12.1 for extra time shall not be considered while calculating the updated stipulated date of completion for this purpose in clause 10 C, Clause 10 CA , and clause 10 CC.

CLAUSE 10D (Excavated / Dismantled Material of Institute Property)

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as Institute's property and such materials shall be disposed off to the best advantage of the Institute according to the instructions in writing issued by the Centre Director.

CLAUSE 11 (Work to be Executed in Accordance with Specifications, Drawings, Orders etc.)

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Centre Director and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions that are not included in the standard specifications of works specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE 12 (Deviations / Variations Extent and Pricing)

The Centre Director shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Centre Director and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

12.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered be extended, if requested by the contractor, as follows:

- (i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus
- (ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Centre Director.

12.2 Deviation, Extra Items and Pricing:

A. For Projects and original works :

In the case of extra item(s) (items that are completely new, and are in addition to the items contained in the contract), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the Engineer-in-Charge shall within one month of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/alteration:

In the case of Extra Items(s) being the schedule items, these shall be paid as per Schedule rate plus cost index (at the time of tender) plus /minus percentage above or below quoted contract amount.

Payment of extra items in case of non-scheduled items shall be made as per the prevailing market rate.

Deviation, Substituted Items, Pricing

A. For Project and Original works :

In the case of substituted items, (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the following para.

- (a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).
- (b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

B. For Maintenance works including works of upgradation, aesthetic ,special repair, addition/alternation:

In the case of substituted item(s) being the schedule items, these shall be paid as per the schedule rate plus cost index (at the time of tender) plus /minus percentage above/below quoted contract amount. Payment of Substitute in case of non-schedule items shall be made as per prevailing market rate.

Deviation, Deviated Quantities, Pricing

A. For Project and original works:

In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in schedule F, the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis, for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities the Centre Director shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of upgradation, aesthetic, special repair, and addition/alteration:

In the case of contract items, which exceed the limits laid down in schedule F, the contractor shall be paid rates specified in the schedule of quantities.

The prescribed time limit for finalizing rates for extra item(s) , Substitute item (s) and Deviated quantities of contract items are as under:

- | | | |
|-------|---|---------|
| (i) | If the Tendered value of work is up to Rs. 45 Lac : | 30 days |
| (ii) | If the Tendered value of work is more than Rs. 45 Lac and upto Rs. 2.5 Crore: | 45 days |
| (iii) | If the Tendered value of work exceeds Rs.2.5 Crore: | 60 days |

12.3 A. For Project and Original works:

The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule F, and the Engineer-in- Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/alteration:

In case of decrease in the rates prevailing in the market of items for the work in excess of the limits laid down in Schedule F, the Engineer-In-Charge shall after giving notice to the contractor within one month of occurrence of excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rate for eh work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

12.4 The contractor shall send to the Engineer-in-Charge once every three months an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Centre Director which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. The Centre Director, CPP-IPR may authorize consideration of such claims on merits.

12.5 For the purpose of operation of Schedule F, the following works shall be treated as works relating to foundation unless & otherwise defined in the contract:

- i) For building: All works up to 1.2 meters above ground level or up to floor 1 level whichever is lower.,
- ii) For abutments, piers, and well staining: All works up to 1.2 m above the bed level.
- iii) For retaining walls, wing walls, compound walls, chimneys, overhead reservoirs/tanks and other elevated structures: All works up to 1.2 meters above the ground level.
- iv) For reservoirs/tanks (other than overhead reservoirs/tanks): All works up to 1.2 meters above the ground level.
- v) For basement: All works up to 1.2 m above ground level or up to floor 1 level whichever is lower.
- vi) For Roads all items of excavation and filling including treatment of sub-base.

12.6 Any operation incidental to or necessarily has to be in contemplation of tenderer while filling tender, or necessary for proper execution of the item included in the Schedule of Quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE 13 (Foreclosure of Contract due to Abandonment or Reduction in Scope of Work)

If at any time after acceptance of the tender, Institute shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Centre Director shall give notice in writing to that effect to the contractor and the contractor shall

act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates full amount for works executed at site and, in addition, a reasonable amount as certified by the Centre Director for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure:

- i) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.
- ii) Institute shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however, Institute shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by Institute, cost of such materials as detailed by Engineer-in-Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.
- iii) If any materials supplied by Institute are rendered surplus, the same except normal wastage shall be returned by the contractor to Institute at rates not exceeding those at which these were originally issued less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to Institute stores, if so required by Institute, shall be paid.
- iv) Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.
- v) Reasonable compensation for repatriation of contractor's site staff and imported labour to the extent necessary.

The contractor shall, if required by the Engineer- in-Charge furnish to him books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.

The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the Institute as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Centre Director shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the Institute from the contractor under the terms of the contract.

A Compensation for such eventuality ,on account of damages, etc. shall be payable @ 0.5 % of cost of work remaining incomplete on date of closure i.e. total stipulated cost of work less the cost of work actually executed under the contract shall be payable.

CLAUSE 14 (Carrying out part work at risk & cost of contractor)

If contractor,

- (i) At any time makes default during currency of work or does not execute any part of the work with the due diligence and continues to do so even after a notice in writing of 7 days from the Centre Director; or
- (ii) Commits default to complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given in that behalf by the Centre Director; or

Fails to complete the works or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in a notice given in writing in that behalf by the Centre Director;

The Centre Director without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to Institute, by a notice in writing to take the part work/part incomplete work of any item(s) out of his hands and shall have powers to:

- (a) Take possession of the site and any materials, constructional plant, implements, stores, etc, thereon; and/or
- (b) Carry out the part work/ part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/part incomplete work of any items(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by Institute because of action under this clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by the Institute in completing the part works/ part incomplete work of any item(s) or the excess loss or damages suffered or may be suffered by the Institute as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Institute in law or as per agreement be recovered from any money due to the contractor on any account and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Centre Director shall have the right to sell any or all of the contractor's unused materials, constructional plant implements temporary building at site, etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

In the event of above course being adopted by the Centre Director, the contractor shall have no claims to compensation for any loss sustained by him by reason of his having purchased any materials or entered into any engagements or made any advance on any account or with view to the execution of the work or the performance of the contract.

CLAUSE 15 (Suspension of Work)

(i) The contractor shall, on receipt of the order in writing of the Centre Director, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Centre Director may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:

- (a) on account of any default on the part of the contractor or ;
- (b) for proper execution of the works or part thereof for reasons other than the default of the contractor; or
- (c) for safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Centre Director.

(ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

- (a) The contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;
- (b) If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Centre Director may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

iii) If the works or part thereof is suspended on the orders of the Centre Director for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Centre Director requiring permission within fifteen days from receipt by the Centre Director of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by the Institute or where it affects whole of the works, as an abandonment of the works by the Institute, shall within ten days of expiry of such period of 15days give notice in writing of his intention to the Centre Director. In

the event of the contractor treating the suspension as an abandonment of the contract by the Institute, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

CLAUSE 15 A (Compensation in case of Delay of Supply of Material by Institute) (DELETED)

The contractor shall not be entitled to claim any compensation from Institute for the loss suffered by him on account of delay by Institute in the supply of materials in schedule "B" where such delay is covered by difficulties relating to the supply of wagons, force majeure or any reasonable cause beyond the control of Institute.

This clause 15 A will not be applicable for works where no material is stipulated.

CLAUSE 16 (Action in case Work not done as per Specifications)

All works under or in course of execution or executed in pursuance of the contract shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance unit of the Institute or any organization engaged by the Institute for Quality Assurance, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or to the Chief Engineer in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the Institute for Quality Assurance, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract the contractor shall, on demand in writing which shall be made (six months in the case of work costing Rs. 10 Lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of, notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in Schedule 'F' may

consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Centre Director to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE 17 (Contractor Liable for Damages, defects during maintenance period) I

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

CLAUSE 18 (Contractor to Supply Tools & Plants, etc.)

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

CLAUSE 18 A (Recovery of Compensation paid to Workmen)

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

CLAUSE 18 B (Ensuring Payment and Amenities to Workers if Contractor fails)

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

CLAUSE 19 (Labour Laws to be complied by the Contractor)

The contractor shall obtain a valid license under the Contract Labour (R&A) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.

CLAUSE 19 A (No Labour Below 18 years)

No labour below the age of 18 (Eighteen) years shall be employed on the work.

CLAUSE 19 B (Payment of wages)

Payment of wages:

- (i) The contractor shall pay to labour employed by him either directly or through sub contractors, wages not less than fair wages as defined by the Government, Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- (ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.
- (iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the contractor's Labour Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorized made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- (iv) (a) The Centre Director concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

(b) Under the provision of Minimum Wages (Central) Rules 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Centre Director shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Centre Director concerned.
- (v) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor's Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.
- (vi) The contractor shall indemnify and keep indemnified the Institute against payments to be made under and for the observance of the laws aforesaid and the Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.
- (vii) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- (viii) Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of

Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

- (ix) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19 C (Safety Provisions for Labour and Penalty on Default)

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

CLAUSE 19D (Submission of Fortnightly Labour Chart by every Fortnight)

The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:

- (1) the number of labourers employed by him on the work,
- (2) their working hours,
- (3) the wages paid to them,
- (4) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and
- (5) the number of female workers who have been allowed maternity benefit according to Clause 19 F and the amount paid to them.

Failing which the contractor shall be liable to pay to the Institute, a sum not exceeding Rs.200/- for each default or materially incorrect statement. The decision of the Centre Director shall be final in deducting from any bill due to the contractor the amount levied as fine and be binding on the contractor.

CLAUSE 19 E (Contractor to Comply Govt. Rules on Health and Sanitary Arrangements for Workers)

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

CLAUSE 19 F (Maternity Benefit Rules for Female Workers Employed by Contractors)

Leave and pay during leave shall be regulated as follows

1. Leave:

- (i) in the case of delivery - maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day.
- (ii) in the case of miscarriage – up to 3 weeks from the date of miscarriage.

2. Pay:

- (i) In the case of delivery - leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.
- (ii) In the case of miscarriage - leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of 3 (three) months immediately preceding the date of such miscarriage.

3. Conditions for the grant of Maternity Leave:

No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than 6 (six) months immediately preceding the date on which she proceeds on leave.

- 4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in Appendix - I and II, and the same shall be kept at the place of work.

CLAUSE 19 G (Penalty for Non-Compliance of Labour Regulations)

In the event of the contractor(s) committing a default or breach of any of the provisions of the Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the Institute a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 % of the estimated cost of the work put to tender. The decision of the Centre Director shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the provisions of the Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R& A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as "the said Rules") the Centre Director shall have power to give

notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities herein before mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Centre Director shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodeled and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Centre Director shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19 H (Providing Hutment, W/S, S/I, Drainage, Sanitation, etc. for Workers)

The contractor(s) shall at his/their own cost provide his/their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land out side Institute campus. (Note : Labour camp is not permitted inside Institute campus)

- (i) (a) The minimum height of each hut at the eaves level shall be 2.10 m (7 ft.) and the floor area to be provided will be at the rate of 2.7 sqm. (30 sq.ft.) for each member of the worker's family staying with the labourer.
- (b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.8 m x 1.5 m (6'x5') adjacent to the hut for each family.
- (c) The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.
- (d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.
- (ii) (a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation the roofs remain water-tight.
- (b) The contractor(s) shall provide each hut with proper ventilation.
- (c) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.
- (d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed.

- (iii) **Water Supply** - The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/ their own cost make arrangements for laying pipe lines for water supply to his/their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.
- (iv) The site selected for the camp shall be high ground, removed from jungle.
- (v) **Disposal of Excreta-**
The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for the removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.
- (vi) **Drainage** – The contractor(s) shall provide efficient arrangements for draining away sludge water so as to keep the camp neat and tidy.
- (vii) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.
- (viii) **Sanitation** - The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19 I (Removal of Incompetent Workers)

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

CLAUSE 19 J (No Part of Building to be Occupied – Action on Breach thereof)

It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody unauthorized during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay a

levy upto 5% of tendered value of work may be imposed by the Centre Director, CPP-IPR whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Centre Director, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19K (Employment of skilled /semi-skilled workers)

The Contractor shall, at all stages of work, deploy skilled / semiskilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute / Industrial Training Institute /National institute of Construction Management & Research (NICMAR) / National Academy of Construction, GIDC or any similar reputed and recognized institutes managed / certified by State / Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled / semi skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in each respect of the trade, its scheduling and list of qualified tradesman along with requisite certificates from recognized institute to Engineer-in-charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesman within two days of written notice from Engineer-in- Charge. Failure on the part of contractor to obtain approval of Engineer-In-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by the contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

Provided always, that the provisions of this clause shall not be applicable for works with estimated cost put to tender being less than Rs. 5 Crores.

CLAUSE 19L (Contributions of EPF and ESI)

The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of employer paid by the contractor shall be reimbursed by the Engineer-In Charge to the contractor on actual basis.

CLAUSE 20 (Minimum Wages Act to be Complied with)

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

CLAUSE 21 (Work not be sublet. Action in case of insolvency)

The contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Institute in any way relating to his office or employment, or if any such officer. or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-

Charge on behalf of the Director, IPR shall have power to adopt the course specified in Clause 3 hereof in the interest of Institute and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22 (Sums Payable by way of Compensation)

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

CLAUSE 23 (Changes in firm's Constitution to be intimated)

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

CLAUSE 24 (Works to be Under Direction of Centre Director)

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

CLAUSE 25 (Settlements of Disputes & Arbitration)

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

- (i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Centre Director on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request the Centre Director in writing for written instruction or decision. Thereupon, the Centre Director shall give his written instructions or decision within a period of one month from the receipt of the contractor's letter.

If the Centre Director fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instructions or decision of the Centre Director, the contractor may, within 15 days of the receipt of Centre Director decision, appeal to the Centre Director who shall

afford an opportunity to the contractor to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Centre Director shall give his decision within 30 days of receipt of contractor's appeal. If the contractor is dissatisfied with this decision of Centre Director, the contractor shall within a period of 30 days from receipt of the decision, appeal before the Centre Director along with a list of disputes with amounts claimed in respect of each such dispute and giving reference to the rejection of his disputes by the Centre Director. The Centre Director shall give his decision within a period of 90 days from the receipt of Contractor's appeal. If the Centre Director fails to give his decision within the aforesaid period or the contractor is dissatisfied with the decision of Centre Director, then contractor may within 30 days from the receipt of the decision of the Centre Director, give notice to the Centre Director for appointment of arbitrator failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

It is a term of contract that each party invoking arbitration must exhaust the aforesaid mechanism of settlement of claim /disputes prior to invoking arbitration.

- (ii) Except where the decision has become final, binding and conclusive in terms of Sub Para (I) above disputes or difference shall be referred for adjudication through arbitration by a sole arbitrator appointed by the Centre Director, If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by Centre Director of the appeal.

It is also a term of this contract that no person other than a person appointed by such Centre Director, as aforesaid should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

It is also a term of this contract that if the contractor does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 120 days of receiving the intimation from the Engineer-in-charge that the final bill is ready for payment, the claim of the contractor shall be deemed to have been waived and absolutely barred and the Institute shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is also a term of this contract that the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds Rs.1,00,000/-the arbitrator shall give reasons for the award.

It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid equally by both the parties.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

CLAUSE 26 (Contractor to indemnify Institute against Patent Rights)

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

CLAUSE 27 (Lump sum Provisions in Tender)

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

CLAUSE 28 (Action where no Specifications are specified)

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturer's specifications, if not available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Centre Director.

CLAUSE 29 (With-holding and lien in respect of sums due from contractor)

- (i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Centre Director or the Institute shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Centre Director or the Institute shall be entitled to withhold the

security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Centre Director or the Institute shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Centre Director of the Institute or any contracting person through the Centre Director pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Centre Director or Institute will be kept withheld or retained as such by the Centre Director or Institute till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Centre Director or the Institute shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner limited company as the case may be, whether in his individual capacity or otherwise.

- (ii) Institute shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract etc to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over payment and it shall be lawful for Institute to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it the amount of such under payment shall be duly paid by Institute to the contractor without any interest thereon whatsoever

Provided that the Institute shall not be entitled to recover any sum overpaid nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the Centre Director on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Centre Director.

CLAUSE 29A (Lien in respect of claims in other contracts)

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Centre Director or the Institute or any other contracting person or persons through Engineer-in-Charge against any claim of the Centre Director or Institute or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Centre Director or the Institute or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Centre Director or the Institute will be kept withheld or retained as such by the Centre Director or the Institute or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor

shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

CLAUSE 30 Employment of coal mining or controlled area labour not permissible

The contractor shall not employ coal mining or controlled area labour falling under any category whatsoever on or in connection with work or recruit labour from area within a radius of 32 km (20 miles) of the controlled area. Subject as above the contractor shall employ imported labour only i.e., deposit imported labour or labour imported by contractors from area, from which import is permitted.

Where ceiling price for imported labour has been fixed by state or Regional Labour Committee not more than that ceiling price shall be paid to the labour by the contractor.

The contractor shall immediately remove any labourer who may be pointed out by the Engineer-in-charge as being a coal mining or controlled area labourer. Failure to do so shall render the contractor liable to pay to Government a sum calculated at the rate of Rs. 10/- per day per labourer. The certificate of the Engineer-in Charge about the number of coal mining or controlled area labourer and the number of days for which worked shall be final and binding upon all parties to this contract.

It is declared and agreed between the parties that the aforesaid stipulation in this clause is one in which the public are interested within the meaning of the exception in Section 74 of Indian Contract Act, 1872.

Explanation:- Controlled Area means the following areas:

Districts of Dhanbad, Hazaribagh, Jamtara – a Sub-Division under Santhal Pargana Commissionery, Districts of Bankura, Birbhum, Burdwan, District of Bilaspur.

Any other area which may be declared a controlled Area by or with the approval of the Central Government.

CLAUSE 31 (Unfiltered water supply)

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

- i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.
- ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.

CLAUSE 31 A (Institute water supply, if available)

Water if available may be supplied to the contractor by the Institute subject to the following conditions:

- (i) The water charges @ 1% shall be recovered on gross amount of the work done.
- (ii) The contractor(s) shall make his/their own arrangement of water connection and laying of pipelines from existing main of source of supply.

- (iii) The Institute do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/ their own cost in the event of any temporary break down in the Institute water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

CLAUSE 32 (Alternate water arrangements)

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

CLAUSE 33 (Return of Surplus materials)

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

CLAUSE 34 (Hire of Plant & Machinery)

- (i) The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work except for the Plant & Machinery listed in Schedule 'C' and stipulated for issue to the contractor. If the contractor requires any item of T&P on hire from the T&P available with the Institute over and above the T&P stipulated for issue, the Institute will, if such item is available, hire it to the contractor at rates to be agreed upon between him

and the Centre Director. In such a case all the conditions hereunder for issue of T&P shall also be applicable to such T&P as is agreed to be issued.

- (ii) Plant and Machinery when supplied on hire charges shown in Schedule 'C' shall be made over and taken back at the Departmental equipment yard/shed shown in Schedule 'C' and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery with condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Centre Director shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.
- (iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his program of work according to the availability of the plant and machinery and no claim what-so-ever will be entertained from him for any delay in supply by the Institute.
- (iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery were made over up to and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working day continuously i) (excluding intervening holidays and Sundays) for bringing the plant in order the contractor shall immediately intimate in writing to the Centre Director when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log-sheet of the plant or machinery. Based on this, if the break-down before lunch period or major break-down will be computed considering half a day's break-down on the day of complaint. If the break-down occurs in the post-lunch period of major break-down will be computed starting from the next working day. In case of any dispute under this clause the decision of the Centre Director shall be final and binding on the contractor.
- (v) The hire charges shown above are for each day of 8 hours (inclusive of the one hour lunch break) or part thereof.
- (vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for leaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the Institute against any loss or damage caused to the plant and machinery either during transit or at site of work.
- (vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one hour lunch break. In case of an urgent work however, the Engineer-in- Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period of 8 hours a day. In that case, the hourly hire charges for overtime to be borne by the contractor shall be 50% more than the normal proportionate hourly charges (1/8th of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for over time, a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored.

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

CLAUSE 35 (Condition relating to use of asphaltic material)

- (i) The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the tar or bitumen used.

- (ii) The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before the process of painting is started and shall hypothecate it to the Engineer-in-Charge. If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Centre Director shall be made and the material return to the contractors. Although the materials are hypothecated to Institute, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Centre Director in writing.
- (iii) The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of the security deposit relating to asphaltic work shall be refunded after the expiry of this period.

CLAUSE 36 (Employment of Technical Staff and employees)

Contractors Superintendence, Supervision, Technical Staff and Employees

- (i) The contractor shall provide all necessary superintendence during execution of the work and as along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Centre Director the name, qualifications, experience, age, address and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) and their qualifications and experience shall not be lower than specified in Schedule 'F'. The Centre Director shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative shall be appointed by the contractor soon after receipt of the approval from Centre Director and shall be available at Site before start of work.

All the provisions applicable to the principal technical representative under the clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at site of work for supervision at all times when any construction activity is in progress and also present himself/ themselves, as required, to the Centre Director and/ or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available the decision of the Centre Director as recorded in the site order book and measurement recorded checked/test checked in measurement books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical principal technical representative and/or other technical representative(s) and if such appoint person are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Centre Director shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held

responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) along with every on account bill/final bill and shall produce evidence if at any time so required by the Centre Director at site fully during all stages of execution of work, during recording/ checking/ test checking of measurements of works and whenever so required by the Centre Director and shall also note down instructions conveyed by the Centre Director or his designated representative(s) in the site order book and shall affix his/ their signature in token of noting down the instructions and in token of acceptance of measurements/ checked measurements/ test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Centre Director, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule 'F'. and the decision of the Centre Director as recorded in the site order book shall be final and binding on the contractor. Further , if the contractor fails appoint suitable technical Principal technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more two days without duly approved substitute or don not discharge their responsibilities satisfactorily, the Centre Director shall have full powers to suspend the execution of work until such date as suitable other technical representative(s)is /are appointed and the contractor shall be held responsible for the delay so caused to the work. The Contractor shall submit a certificate of employment of the technical representative (s) (in the form of copy Form -16 or CPF deduction issued to the Engineer employed by him) along with every on account bill final bull and shall produce evidence if at any time so required by the Centre Director.

- (iii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Centre Director shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Centre Director to be undesirable. Such person shall not be employed again at works site without the written permission of the Centre Director and the persons so removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 37 (Levy / Taxes payable by Contractor)

- (i) Sales Tax/VAT (except Service TAX), Building and other construction Workers Welfare Cess or any other tax or cess in respect of this contract shall be payable by the contractor and Institute / Government shall not entertain any claim whatsoever in this respect. However, in respect of service tax, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Centre Director after satisfying that it has been actually and genuinely paid by the contractor.

- (ii) The contractor shall deposit royalty and obtain necessary permit for supply of the forest produce from local authorities.
- (iii) If pursuant to or under any law, notification or order any royalty cess or the like becomes payable by the Institute / Government and does not any time become payable by the contractor to the State Government, Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the Institute / Government and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.

CLAUSE 38 (Conditions for reimbursement of levy / taxes if levied after receipt of tenders)

- (i) All tendered rates shall be inclusive of all taxes and levies (except Service Tax) payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Centre Director (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.
- (ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Institute and/or the Engineer-in-Charge and further shall furnish such other information/document as the Centre Director may require from time to time.
- (iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Centre Director that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 39 (Termination of Contract on death of contractor)

Without prejudice to any of the rights or remedies under this contract if the contractor dies, Centre Director shall have the option of terminating the contract without compensation to the contractor.

CLAUSE 40 (If relation working in Institute then the contractor not allowed to tender)

The contractor shall not be permitted to tender for works in the Institute (Division in case of contractors of Horticulture/Nursery categories) responsible for award and execution of contracts) in which if his near relative is posted as Accountant or as an officer in any capacity. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of Institute. If however the contractor is registered in any other department, he shall be debarred from tendering in Institute for any breach of this condition.

NOTE: By the term “near relatives” is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE 41 (No Engineer to work as Contractor within one years of retirement)

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

CLAUSE 42 (Return of material & recovery for excess material issued) (DELETED)

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

CLAUSE 43 (Compensation during warlike situations)

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Centre Director to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Centre Director, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Centre Director. The contractor shall be paid for the damages/destruction suffered and for the restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work.

In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Centre Director.

CLAUSE 44 (Apprentices Act provisions to be complied with)

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

CLAUSE 45 (Release of Security deposit after labour clearance)

Security Deposit of the work shall not be refunded till the contractor produces a clearance certificate from the Labour Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the Labour Officer under intimation to the Centre Director. The Centre Director, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, on record till after 3 months after completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released if otherwise due.

Integrity Pact to Contractor

To,

Subject : NIT No. _____ of the work
Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and
Construction of Canteen Building including Plumbing and Electrification at CPP-IPR
Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam - 782402

Dear Sir,

It is hereby declared that CPP-IPR is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid document, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of Integrity Agreement on the behalf of CPP-IPR.

Yours faithfully,

Centre Director
CPP-IPR

Integrity Pact to Client

To,
The Centre Director
CPP-IPR, Nazirakhat
Sonapur, Assam

Subject: Submission of the work of _____

Dear Sir,

I/We acknowledge that CPP-IPR is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender /bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I /We will stand disqualified from the tendering process. I/We acknowledge that **THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE** of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by CPP-IPR. I. We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my /our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, CPP-IPR shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid in accordance with terms and conditions of the tender/bid.

Yours faithfully,

(Duly Authorized signatory of the Bidder)

**To be signed by the bidder and same signatory competent / authorized to sign
the relevant contract on behalf of IPR**

INTEGRITY AGREEMENT

This Integrity Agreement is made at on this day of20.....

BETWEEN

Centre Director, CPP-IPR, Nazirakhat, Tepesia, Sonapur, Assam – 782402, India

.....,
(Hereinafter referred as the ‘**Principal/Owner**’, which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/firm/Company)

through Hereinafter referred to as the
(Details of duly authorized signatory)

“**Bidder/Contractor**” and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns).

Preamble

WHEREAS the Principal/Owner has floated the Tender (NIT No.)
(hereinafter referred to as “Tender/Bid”) and intends to award, under laid down organizational procedure, contract for

Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M),
Assam - 782402

hereinafter referred to as the “**Contract**”.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as “Integrity Pact” or “Pact”), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Principal/Owner

- (1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- (2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

- (1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- (2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
 - (a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - (b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or nonsubmission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - (c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal

gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

(d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

(e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

- (3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- (4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
- (5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- (1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.
- (2) Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or

terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

- (3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

- (1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
- (3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

- (1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/sub-vendors.
- (2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
- (3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6: Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, IPR.

Article 7: Other Provisions

- (1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Head quarters of the Division of the Principal/Owner, who has floated the Tender.
- (2) Changes and supplements need to be made in writing. Side agreements have not been made.
- (3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- (4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- (5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

Article 8: Legal and Prior Rights

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....
(For and on behalf of Principal/Owner)

.....
(For and on behalf of Bidder/Contractor)

WITNESSES:

1.
(Signature, name and address)

2.
(Signature, name and address)

Place:
Dated:

SPECIAL CLAUSES OF CONTRACT (SCC)

1. GENERAL:

The following special clauses of contract shall be read in conjunction with general clauses of contract enclosed herein before. The following clauses shall be considered as an extension and not limitation of the obligations of the contractor. In case the discrepancy between these special clauses of contract and the General Clauses of contract, these Special Clauses shall take precedence over the General clauses of the Contract.

2. SCOPE AND LOCATION OF WORK: (Please refer to Schedule “A”)

The contractor carrying out this work will strictly abide by the Local / Municipal / Statutory Bodies / Police / Institute's regulations as well as security regulations imposed by such authorities from time to time regarding transshipment of equipment, operations, drainage, late hour working, working on holidays, bringing / taking away of materials, disposal of debris, excavated / surplus materials etc. as and wherever applicable.

The contractor for this work shall co-ordinate for his work along with other contractors who will be simultaneously carrying out the work in same area.

All workmen working at height beyond 1st floor shall be provided with safety belts and the workers should be directed to wear safety belts as long as they are working. The instructions issued by the Centre Director with regard to security of workmen from time to time to be strictly followed. All other safety measures stipulated in the tender document shall be strictly followed failing which the Engineer-In –Charge shall take immediate action deemed fit and the same shall be binding on the contractor.

The work shall be completed as per the detailed time schedule which shall be prepared after the issue of work order. However, the entire work shall be completed within the stipulated completion period as specified in the Tender Notice.

3. SITE INVESTIGATIONS:

The tenderer is advised to visit the site of work with prior permission of Centre Director or his authorized representative of CPP-IPR to acquaint themselves as to the nature and location of the work, access to the site, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labour, water, electric power and road, as also uncertainties of weather or similar physical conditions of the site, the formation and conditions of the ground, the character, quality and quantity of surface and sub-surface materials to be encountered, including subsoil water levels, the character of equipment and facilities needed preliminary to and during the progress of the work, and all other matters which can be, in any way, effect the work or the cost thereof under the contract.

4. STAKING OUT BASE LINES AND LEVELS:

The contractor shall establish at site the layout of the building/road etc. for the work from base lines and grids established by the Institute and shall be responsible for all measurements in connection therewith. The contractor shall, at his own expenses, furnish all stakes, templates, platform, equipments, ranges and labour that may be required in setting out or laying out any part of the work. The contractor to carry out the Centre lines of the proposed buildings with the total station (survey equipment) and to set out with no extra cost. The contractor shall be held responsible for the proper execution of the work to such lines, levels and grids as may be established or indicated on the drawings and specifications, the contractor shall check the bench marks and stakes existing at the site for laying out lines and levels.

The contractor has to construct and maintain proper bench marks at all salient positions in order that the lines and levels may be accurately checked at all times.

Total Station, Theodolite, levels, prismatic compass, chain, steel and metallic tapes and all other surveying instruments found necessary on the works shall be provided by the contractors for use at site in connection with this work.

5. COMMENCEMENT AND COMPLETION OF WORK AND PROPER SCHEDULE:

The work shall be completed within the stipulated period of completion.

The Contractor shall submit detailed time schedule within 15 days from the date of issue of work order, for completion of work, indicating all the important activities of execution of the work/ group of the items in sequence of its operation etc. including making ready the sample finishes / finished sample flat for building works, in consultation with Engineer-In-Charge and submit the same for approval of the work awarding authority. This time schedule, after approval, shall form part of the contract and the work in all respect shall be carried out as per this time schedule.

Time shall be the essence of the contract. The rate of progress of the whole work as well as for all the important individual items of work shall not be slower than as laid down in the attached progress schedule.

The contractor shall properly assess his capability and fully satisfy himself before tendering that he will be able to adhere the specified schedule. In this connection the attention of the tenderer is specially invited to clause 2 of the General Conditions of the Contract.

The contractor shall furnish to the Engineer-in-Charge weekly progress report in triplicate on Saturday of every week indicating the following:

Sr.No.	Item of work for the	Schedule progress week	Actual short fall if any	Reason for make-up the short fall	Steps taken to make up the short fall

5 (a) The contractor shall employ sufficient number of skilled and unskilled labour required for the work for maintaining the progress of work as stipulated in the time schedule. The trade –wise labour strength should be intimated to the Engineer-in-Charge everyday in writing. The skilled labour shall be increased if required by Engineer-in-Charge to maintain the progress of work.

6. SEQUENCE OF WORK:

The contractor shall execute the work as per the sequence given by the Engineer-in-Charge from time to time so that the other items of work to be executed by other agencies are completed progressively along with the main work.

7. CO-OPERATION WITH OTHER CONTRACTORS:

The contractor shall extend all facilities and give complete co-operation for the execution of various connected work if required to be carried out simultaneously by other agencies while his own work is in progress. The co-ordination will be effected in consultation with the Engineer-in-Charge of the work. Other contractors are also likely to be authorized by the Institute to work in the same area during the construction stage for work.

Since Electrical/Air-conditioning/other agencies will have to carry out their works such as installations of conduits, junction boxes, wiring, distribution boxes, switches, fittings and fixtures etc. in a planned manner in stages which will be in relation the status and progress of civil construction works, the civil contractor shall accept and take over the inventories of installation of Electrical/Air-conditioning/other agencies when their works are in part/full completion stage. The same inventory in the same condition will have to be handed over back to the electrical/air-conditioning/other agencies for carrying out their remaining works after the stage wise completion of the civil works. During final handing over of the building(s) to the Institute / Users, the civil contractor will again take over the installation/inventories of fittings and fixtures of electrical/air-conditioning/other agencies and will complete all his balance finishing works and hand over his works along with the installations of other agencies to Institute/Users.

The contractor shall afford all facilities:

- (a) For the installation of embedded parts, sleeves with its accessories in slabs, beams and walls by the other agencies before the reinforcement is placed necessary cut-outs in the shuttering will have to be provided by the civil contractor for purpose for which no extra payment will be admissible.
- (b) For the installation of various service lines in the walls, floors, slabs, ducts etc.
- (c) For using approach road etc. by the other contractors.

No extra claims on account of facilities provided for carrying out the work mentioned above will be entertained.

8. CO-ORDINATION:

The contractor will carry out the entire work in a planned manner by co-ordinating his work, with the the other contractors, who will simultaneously carrying out the work in the same area and also co-ordinate in connection with the position of various fixtures, inserts, embedments and other allied work connected with the completion of building / subject work.

In case of any dispute between the contractors engaged on the same work, decision of Centre Director shall be final and binding.

9. APPROACH ROADS AND TRANSPORTATION OF EQUIPMENT AND MATERIALS:

Contractor will be permitted to use the existing roads in the establishment area for the purpose of transporting equipment and materials and for use of labour etc. The Centre Director, however, will not undertake to provide any approach roads to the actual site of work. It shall be the entire responsibility of the contractor to provide and maintain such temporary approach roads including cross drainage works if

any at his own cost for the purpose of movement of men, materials and equipment. Layout of such approach roads shall be submitted to Centre Director for his approval before undertaking the construction of the same. Such approach roads shall be made available to other agencies for carrying out the work in the same area in consultation with the Engineer-in-Charge of the works without any cost.

10. OPERATIONS AND STORAGE AREAS:

All operations of the contractor shall be confined to areas authorized by the Centre Director and storage of materials shall be over the areas specially indicated by the Centre Director. Materials like sand and metal of different sizes shall be stored in properly constructed bins with hard floor to avoid inter mixing as well as mixing with objectionable materials. The contractor shall be obliged to keep the premises in hygienic conditions by proper drainages of the area provided with suitable approaches throughout the period of contract. He shall rectify all damages caused to the Institute property within the areas thus allotted. He shall be responsible to clear all rank, vegetation at site at his own cost.

11. CONTRACTOR'S STORAGE AND SITE OFFICE:

Suitable area near the site of work shall be allocated to the contractor, @ Re.1/- per month as token compensation for storing his equipment, plant, materials etc. and for his site office and cement godown. He will, however, be solely responsible for watching or guarding his property and materials issued to him by the Institute. Contractor shall cover all materials at site with requisite insurance against theft, larceny, dacoits, fire tempest and flood. He, however, will have to dismantle the shed and vacate the land after the receipt of due notice from the Centre Director if the same is obstructing any work.

The tenderer should obtain necessary permission/approval from Statutory authorities of Local bodies for construction of temporary structures at site of work such as cement godown, stores, site office etc. It will be responsibility of the tenderers to prepare proper plans, to pay any requisite fees to statutory authorities and to execute the work for the temporary structure at their own cost as per the conditions and rules laid by statutory authorities.

12. TEMPORARY BUILDINGS:

Warehouse, shed, workshop and office facilities as required by the contractor shall be provided by him at his own expense. Area for the same will be made available by the Institute @ Re.1/- per month as token compensation. Prior approval of the Engineer-in-Charge shall be obtained in respect of location and layout and details of those buildings. After the work is over all these temporary facilities shall be removed by the contractor at his own expense to the satisfaction of the Engineer-in-Charge within 10 days from the date of completion.

No labour shall be permitted to stay at site or in the partly completed building at any time and no land for erection of temporary huts for labourers will be made available by the Institute. The contractor shall make his own arrangements for labour hutments elsewhere outside the Institute's premises/area at his own cost. Unauthorized occupation of any area/partly completed building by the contractor's labourer will be treated as trespass and action will be taken to evict them including termination of contract if deemed fit. Sanitary as well as water supply and drainage facilities as required by the labour laws in force, are to be provided by the contractor at his own cost.

13. TRAFFIC INTERFERENCE & INCONVENIENCE TO THE PUBLIC:

The contractor shall conduct his operations so as to interfere as little as possible with the traffic/public. When interfere to traffic is inevitable, a notice of such Interference shall be given to the Centre Director well In advance (at least 2 days at any stage, if it becomes necessary to divert the traffic, the contractor shall obtain permission from the local traffic authorities at his own expense. The Institute will render reasonable assistance in the matter. The contractor shall take all precaution and other measure, such as providing warning signals, temporary diversion etc. all as directed by the Engineer-in-Charge.

The Contractor shall not deposit materials anywhere at work site which will seriously inconvenience the public. The Engineer-In-Charge may require the contractor to remove any materials which are considered to be a danger or in convenience to the public or cause them to be removed at the contractor's cost.

The contractor shall exercise full care to ensure that no damage is caused by him or his workmen during the operation to the existing water supply and power lines. The cost of any such damage and risks arising out of this shall be entirely borne by the contractor.

14. DRAINAGE AROUND THE BUILDING AND FOUNDATION FOR OTHER WORKS:

The contractor shall be entirely responsible for the provision and maintenance of efficient drainage arrangements in the work site to lead of all water whatsoever pumped from the excavations on account of rains, floods, springs or any other source whatsoever. The foundation trenches shall be kept free from water while all the works below ground level are in progress.

Flooding or ponding of water in the work site shall not be permitted under any circumstances whatsoever and the contractor shall take all necessary precautions to prevent the same by providing suitable pumps and other dewatering arrangement.

The cost of repairing damages if any, to the work under execution or to any Institute property in and around the site shall be entirely borne by the contractor where such damages are due to his non compliance with the above conditions.

15. SPECIFICATIONS AND DRAWINGS:

15.1 The drawings furnished to the contractor for this work shall be interpreted by the use of given dimensions and nomenclature only and the drawings shall not be scaled. Drawings to a large scale shall have precedence over those to a smaller scale. Prior to the execution of the work, the contractor shall check all drawings, specifications and shall immediately report all errors, discrepancies and/or omissions discovered therein to the Engineer-in-Charge and obtain appropriate orders on same. Any adjustment made by the contractor without prior approval of the Engineer-in-Charge shall be at his own risk. Description of item in the schedule of quantities is brief and therefore, shall be read in conjunction with the relevant drawings and the specifications and the contractor's rate shall be deemed to be for such complete work unless otherwise specified by the contractor while tendering.

15.2 In case any difference or discrepancy between the description in the schedule of quantities and the specifications, the schedule of quantities shall take precedence.

In case any difference or discrepancy between the description in the schedule of quantities and the drawing, the description in schedule of quantities shall take precedence.

In case of any difference or discrepancy between drawing and specifications the specifications shall take precedence.

- 15.3 Prior to submission of drawing called for as per specifications or any other drawings, contractor may intend to submit for approval, the contractor shall be responsible for thoroughly checking of all drawings to ensure that they comply with the intend and the requirements of the contract specifications and that they fit in with the overall layout. Drawing found to be inaccurate or otherwise in error will be returned to the contractor for corrections.
- 15.4 For all drawings to be submitted by the contractor, for the approval of the Engineer-in-Charge, the contractor shall submit 6 (six) copies of each drawing & soft copy (PDF as well as editable) of drawing.
- 15.5 The approval of the drawings by the Engineer-in-Charge shall not be construed as a complete dimensional check but will indicate only that the general method of construction as detailed is satisfactory. The contractor shall be responsible for the dimensions and designs of adequate connection supports, details and satisfactory construction of the work.
- 15.6 Cost of all shop drawings, fabrication drawings or formwork drawings and details to be furnished by the contractor shall be deemed to be included in his tendered rates. Approval of shop drawings shall not be construed as authorized additional work of increased costs to the Institute.

16. SAMPLES:

Samples of all materials to be incorporated in the work shall be submitted to the Centre Director for his approval without any extra cost. The approved samples will be kept with Engineer-in-Charge till the completion of the work. Materials not conforming strictly to the approved samples will be rejected.

Samples of various materials required for testing shall be provided free of charge by the contractor. Testing charges if any shall be borne by the contractor. All other expenses required to be incurred for taking the samples; conveyance packing etc. shall be borne by the contractor.

- 16.1 in addition to submission of samples of materials, The contractor, shall make as sample flat (Sample finishing in case of Non-Residential buildings) ready in all respect, including finishing items of works of civil works including installation of fittings as well as those of water supply, plumbing and sanitation work and electrical work, internal fittings, fixtures and wiring etc. to determine the acceptable standard of material and workmanship. The sample flat with all final finishes items of work in the building (s). Each of these samples of items of work/ trade / materials approved by the Engineer-In Charge will be endorsed as "Guide line samples", as per which further works shall be executed in strict conformity with standard of materials and workmanship.

The Provision of co-ordination and co-operation with other agencies shall be mutatis-mutandis applicable to the above mentioned "Sample flat / sample finishing works" also.

17. EXECUTION OF WORK AND INSPECTION:

The work shall be conducted under the general direction of the Engineer-in-Charge and is subject to inspection by his appointed representative to ensure strict compliance with the terms of the contract. No failure of the Engineer-in-Charge or his designated representative during the progress of the work to discover or to reject materials, or work not in accordance with the requirement of this contract shall be deemed as on acceptance thereof or a waiver of defects therein and no payment by the Centre Director or

partial or entire occupancy of the premises shall be construed to be an acceptance of work or materials which are not strictly in accordance with the requirements of the contract. No changes whatsoever to any provision of specifications shall be made without authorization from the Centre Director.

18. SUPPLY OF WATER FOR CONSTRUCTION PURPOSE:

Note : In case of non-stipulation of departmental (Institute) water supply as per Schedule –“B” of Schedules (Salient Governing features of Tender / work) the contractor shall make his own arrangement of water required for this work, at his own cost, subject to the approval of Centre Director.

The contractor shall arrange to provide a minimum storage of 5000 Ltrs. (or two days requirement whichever is higher) of water at building location and all necessary pumps for storage of water shall be built by the contractor at his own cost at location to be approved by the Engineer-in Charge.

The water storage tanks should be leak proof and wastage and misuse of water is strictly prohibited. Contamination and pollution of water is to be strictly avoided. Construction water should not be used for drinking or for domestic purpose. Contractor will make his own arrangement for water required for drinking purposes at site of work and for all purposes at the labour camp at his own cost.

19. SUPPLY OF ELECTRICITY FOR CONSTRUCTION PURPOSE:

In case of stipulation of departmental (Institute) supply of Electricity for construction purpose under Schedule “B” of Schedules (Salient Governing features of Tender /work), the same shall be dealt with as under:

(In case of non-stipulation of departmental supply of Electricity for construction purpose in **Schedule “B”**, the contractor shall make his own arrangement for the same as required at his own cost.)

19.1 General:

Temporary electric power, if required by the contractor shall be provided for bonafide construction purpose required for the site job but limited to a total max. of **5 KW (connected) at 3 phase, 410 volts, 50 cps**. Some of the important conditions governing the power supply are as follows:

- (a) The power will be supplied (on receipt of application in prescribed form) at one point within **500 M.** of the building premises. The contractor shall install his own main switch, cables, electric cupboard/switch room etc. of adequate capacity of suitable type to receive, control and further distribute the power involved. The exact location and further details about supply point will on receipt of the contractor's application, be decided upon by the Institute, whose decision in the matter will be final and binding. The total final connected load and the anticipated maximum demand shall be furnished by the contractor about a month in advance of the actual initial requirement and for any addition in load subsequent to the initial supply, date, at least one week's notice from the date of submission of installation test report for the said additional load will be given.
- (b) The contractor shall provide his own switches, a tested KWH Meter, earth station, earth leakage circuit breakers cable/lines of approved make and of adequate capacity from the aforesaid supply point to the various utilization points and also be responsible to maintain the same in good and safe condition at all times as per relevant codes and electricity rules. He will

also be fully responsible at all times for any accident/mishap in his electrical installation/appliances etc. (including the consequential aspects) if the same are found to be due to defective construction/maintenance etc. of his installation or negligence in observation of rules, or safety precautions. The layout and other details of these lines shall be got approved in advance by the Institute and no change in the same shall be subsequently carried out without Institute prior approval. The Institute's Electrical Engineer may any time summarily disconnect, in the interest of safety, the power supply without notice, if any dangerous situation is seen in the contractor's installation or if the contractor has failed to maintain the installation satisfactorily in spite of a written notice served on him. The responsibility for such a disconnection will always be with the contractor who will have no claim whatsoever in this respect on the Institute.

- (c) The contractor's electrical installation shall conform in all respects to the relevant rules, regulations, statutory provision and codes of practice as also be in accordance with the rules of the local licensee Undertaking (as the case may be) as existing new or as may be amended/enforced from time to time in the future. Installation test reports shall invariably be furnished by the contractor before any load is connected. Periodical test reports by every 3 months for the complete installation shall also be submitted by the contractor in accordance with I.E.E Rules for temporary installation.
- (d) Power will be supplied at the point mentioned in para (a) above at the usual 400 V, 3 Phase, 50 cycles. 4 wire or single phase 230 V, 2-wire system as the case may be subject to permissible variations in voltage and frequency. In case 3 phase supply the individual single phase loads if any shall be suitably connected so that the total load over three phases at the supply point is balanced as much as possible. No individual single phase equipment or a single phase system shall normally exceed a rating of 2 K.W.
- (e) The Institute may install, depending on availability, in the covered space provided by the contractor at the aforesaid supply point necessary energy meter (additional) for registering the electricity (i.e. KWH) supplied. It may be necessary to install separate Institutes meter (rental amount as mentioned above) for lighting consumption and in that case the contractor shall have to provide separate lighting circuits.
- (f) The supply of electricity shall be charged at the rates specified in the **Schedule "B"** at the rate fixed by the Institute from time to time which will be generally at par with the temporary/supply tariff of State Electricity Board. The contractor shall be responsible for the safety of the Institute's meter, cut outs etc. installed at his site.

NOTE: The electricity will normally be billed once every month at the prevailing supply rate from time to time. In case if any increase in supply rate, the same shall be charged with an addition of departmental charges as per **Schedule –"B"**.

- (g) The power supply shall be subject to all such restrictions, regulations etc., as are in existence now and as may be (enforced from time to time in future by the licensee/Government/Department or by any other competent authority for which the contractor have no claim whatsoever. Although all efforts shall be made to provide a continuous supply, the contractor shall have no claim whatsoever due to any breakdown or interruption etc. in the supply at any time.

19.2 Construction and Maintenance by the Contractor:

As mentioned above, the contractor shall maintain his entire electrical installation, appliances etc. in good and safe condition as required under relevant rules and codes of practice. However, the following precautions and directives shall be followed in addition to observing other essential rules:

- (i) The minimum clearance (measured at the lowest sag point) to be maintained for all over head lines shall be 4 Mtrs. cross country or along roads and 6.1 meters across roads.
- (ii) Metallic poles as a general rule should be avoided and if used should be earthed individually.
- (iii) All loose hanging of wires and cables should be avoided. The line wires should be properly supported and an approved method of fixing shall be adopted.
- (iv) Installation shall not cause any hindrance to the normal movement of men and materials at site.
- (v) All cables and wires should be adequately protected against mechanical damage during construction activity of all contractors, working at site.
- (vi) In case the cable is required to be laid in ground, it should be adequately protected by covering the same with bricks, R.C.C. tiles or any other approved means and cable markers provided at suitable intervals as per approval of the Institute.
- (vii) Laying of cable and wires directly on floor shall not be allowed but if absolutely necessary for some very short lengths, the same shall be taken through suitable mechanical covering like G.I./M.S. Pipes etc.
- (viii) All the outdoor switch boards, equipments etc., should be adequately protected against rain or preferably they should not be exposed to weather.
- (ix) If overhead lines using bare conductors are installed, a guard wire system of adequate size shall run along the cables /wires and earthed effectively.
- (x) The connection for portable machines shall be taken only through suitably rated 3 pin socket points. Iron clad industrial type outlets are preferred. While taking supply through socket outlet a plug top must be used, avoiding inserting of loose wires in the sockets. The third pin of the plug shall invariably be earthed and 3 core wire of appropriate specifications and capacity shall be used.
- (xi) All three phase equipment shall be provided with duplicate earthing. All metallic frames, light fixtures, portable equipments etc. should be effectively earthed to main earthing.
- (xii) Duly authorized persons having valid wireman's license/competence certificate must be employed under the supervision of a qualified and experienced Electrical Supervisor for carrying out electrical work and repair of electrical equipments, installation and maintenance etc. at site.

19.3 Additional Power:

Power in excess of the limit stipulated above, subject to availability, may be provided if applied for by the contractor by installing additional cables/lines from the change over nearby. These additional lines along with necessary switches etc. shall be provided by the contractor.

20. TENDERED RATES:

The rates quoted by the tenderer in the schedule shall be inclusive of all taxes including Sales Tax, VAT, Purchase Tax, workers welfare cess and other statutory levies imposed by the Government or other public bodies from time to time. The rates quoted shall also cover the cost of necessary protection including labour, materials and equipment to ensure safety and protection against risk or accident, compensation for injury to life and damage to property if any, caused by the contractor's operations connected with this work. The rates shall be firm and shall not be subject to change due to variations during the entire period of execution of the work in cost of materials, labour and conditions, or any other conditions whatsoever except for the provisions contained in clause 10 C and 10 CA of General conditions of contract as applicable for this work.

The rates quoted by the tenderer shall also be inclusive of State Sales Tax on the transfer of property in goods involved in execution of works contract Act (in other words WCT/ Turn over Tax), if any which is to be paid by the tenderer to the government from time to time during the execution of the contract/works. No separate claim on this account will be entertained by the Institute. Also no certificate(s) for exemption of Octroi / Entry tax shall be issued by the Institute.

Unless otherwise stated in schedule of quantities, rates for item quoted by the tenderer should be for the complete work including supply and fixing with all materials and should be for all heights and depths, lifts and leads, lengths and widths involved in the work.

Any cement slurry added over the base surface (or) for continuation of concreting , for better bond , is added to have been in-built in the item (unless otherwise explicitly stated and nothing extra shall be payable and no extra cement considered in consumption on this account.)

Rate for all items, in which use of cement is involved, shall include charges for curing.

The contractor when called for by the Institute should furnish detailed rate analysis in support of the rates quoted by him against each item of the tender. The Institute reserves the right to utilize the analysis thus supplied in setting any deviations or claims arising on this contract.

21. CLAIMS AGAINST THE CONTRACTOR:

Whenever any claim against the contractor for the payment of a sum or money arises out of or under the contract, Institute shall be entitled to recover such sum by appropriating in part or whole, the security deposit of the contractor and to sell any Institute promissory notes etc. forming the whole or part of such security. In the event of the security deposit having been taken from the contractor, the balance or the total sum recoverable, as the case may be, shall be deducted from any sum then due or which at any time thereafter may become due from the contractor, under this or any other contract with Institute, should this sum be not sufficient to cover the full amount recoverable, the contractor shall pay to Institute on demand the balance remaining due. Institute shall have the right to cause an audit and technical examination of the work and the final bill of the contractor including all supporting vouchers, abstracts etc. to be made after payment of the final bill and if as a result of the due audit and technical examination any sum is found to have been over paid in respect of any work done by the contractor under the contract or any work claimed by him to have been done under the contract and found not have been executed, the contractor shall be liable to refund the amount of the over payment and it shall be lawful for Institute to recover the same from him in the manner prescribed above of this clause or in any other manner legally permissible and if it is found that the contractor was paid less than what was due to him under the contract in respect of any

work executed by him under it, amount of such under payment shall be duly paid by Institute to the contractor.

Provided that Institute shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any such paid short where such payment has been agreed upon between the Engineer-in-Charge on one hand and the contractor on the other, under any term of the contract permitting payment for work after assessment by the Engineer-in-Charge.

Provided further no recovery of an over payment and no payment of any sum paid short shall be made where such over payment or under payment has remained undiscovered for a period of three years after the date of payment of the final bill.

22. MODE OF MEASUREMENTS:

Measurements for all hidden items once taken jointly and so accepted by the tenderer in the bills, in writing shall be final and binding. No re-recording of measurements for hidden items of work be permitted.

The contractor shall provide at his own cost suitable weighing and measuring arrangements at site for checking the weight/ dimensions as may be necessary for execution of the work. All measuring tapes (of steel), scaffolding and ladders which may be required for taking measurements shall be supplied by the contractor.

If the contractor fails to accompany the Engineer-in-Charge or his authorized person to take measurements then he shall be bound by the measurements recorded by the Engineer-in-Charge or his representative.

23. STORES AND MATERIALS AT SITE:

Stores and materials required for the works are to be deposited by the contractor only in places to be indicated by the Engineer-in-Charge. The Centre Director shall have a right at any time to inspect and examine any stores and materials intended to be used in or on the works either on the site or at any factory or workshops or other places where such stores or materials are being constructed or manufactured or processed or any place from where they are being obtained and the contractor shall give such facilities as required to be given for such inspection and examination.

The Engineer-in-Charge shall be entitled to have tests made without any extra cost to the Institute at an approved laboratory for any stores and or materials supplied by the Contractor, who shall provide at his own expense all the facilities which the Engineer-in-Charge may require for this purpose.

Any stores and materials brought to site for use on the work shall not be removed off the site without prior written approval of the Centre Director, but on final completion of the work, the contractor shall at his own expenses remove from the site all surplus stores and materials originally brought by him.

24. PROPER DRAWINGS AND INSTRUCTUIONS:

The Centre Director shall have full powers and authority to supply to the contractor from time to time during progress of the work such further drawings and instructions as shall be necessary for the purpose of proper and adequate execution and maintenance of the work and the contractor shall carry out the work and be bound by the same.

One copy each of the drawings furnished to the contractor shall be kept by the contractor at the site and the same shall at all reasonable times be made available for inspection and use by the Engineer-In-Charge and any other person authorized by the Centre Director.

25. EMPLOYMENT OF STAFF FOR PLUMBING & ELECTRICAL WORKS:

25.1 Employment of certified plumber:

Certified plumbers should be employed by the contractor on the work for main sewer, filtered and unfiltered main.

25.2 Employment of licensed electrical foreman:

The contractor should employ a licensed electrical foreman to supervise the Electrical works.

26. GOVERNMENT LABOUR ACT:

The contractor has to follow strictly the Government labour Acts, which are and will be in force during the period of execution of work, all necessary arrangement for labourer's safety, insurance will have to be made by the contractor as per Municipal rules / Contractor's Labour regulations / other Central or Local statutory body / Institute's rules. **The Contractor shall insure his labourers with Janta Insurance Policy and all risk insurance policies etc. at his own cost.**

27. DEDUCTION OF INCOME TAX:

As per Section 194-C of Income tax Act 1961, as amended from time to time the, income tax and Surcharge thereon will be deducted at the rate prescribed by Ministry of Finance , Department of Revenue , Central board of Direct Taxes from time to time , of the gross value of the work done from the bills. A certificate for the amount so deducted will be issued by the Institute.

28. URGENT REPAIRS:

If by reason of any accident or failure or other event occurring to or in connection with the work or any part thereof either during the period of maintenance, any remedial or other work or repair shall in the opinion of the Centre Director be urgently necessary for security and the contractor is unable or unwilling, at once, to do such work or repair, the Engineer-in-Charge may be his own or other workmen do such work or repair as he may consider necessary. If the work or repair so done which in the opinion of the Centre Director the contractor was liable to do at his own expenses under the contract and all cost and charges properly incurred by the Engineer-in-Charge in so doing shall on demand be paid by the contractor or may be deducted from any sum due or which may become due to the contractor provided always that the Centre Director shall soon after the occurrence of any such emergency as may be reasonable, practicable, notify the contractor thereof in writing.

29. SECURITY REGULATIONS:

The contractors have to strictly follow the regulations of the Institute at the work site regarding entry of personnel, material etc. and any other regulation that might be enforced from time to time. All materials and articles brought by the contract to the work site shall have to declare at the security gate. Similarly no materials shall be taken out from the Institute premises without proper gate pass, which will be issued by the Centre Director to the contractor on written request. It is to be noted that loading of contractor's materials in vehicles and trucks shall be done in the presence of Institute personnel. The contractor's representative will have to escort the materials till the security check is over.

The contractors, suppliers, vendors, workers engaged in work/business will be issued with renewable entry permit to avoid unauthorized entry in the Institute premises/site on scrutiny of applications in prescribed form.

For working on Sundays, Holidays and late hours permission will be accorded by the Centre Director.

The area where the proposed work is to be carried is area under the control of Security authorities of Institute. Entry to the site of work shall be through the main gate of Institute only. The contractor shall follow strictly the security regulations of the Institute at site of work regarding entry of personnel, materials etc. and other regulations of the Institute that might be enforced from time to time at the work site and also in the campus for smooth and efficient operation. The Contractor, his agents, representatives, workmen etc and his materials, carts, trucks or other means of transport etc, will be allowed to enter through and leave from such point of entry/exit at such times, the authorities in-charge of the area at their sole discretion may permit.

The contractor, his agents and representatives are required to be in possession of the individual identity /muster cards passes. The muster cards or passes are examined by the security staff at the time entry/exit inside the Institute area and also at any time or number of times within such area.

The contractor will have to apply for entry/muster permits of likely number of labour to be engaged during the week for the workers and authorize their representatives to collect the entry permits for labour from the Institute Authority.

It will be the responsibility of the contractor to maintain the list of labourers permitted to work inside the premises a register and the representative of contractor's labour will have to issue entry pass to each labour after making necessary entry in the registers.

The contractor, his agents, representatives, workmen shall strictly observe the orders pertaining to fire precautions prevailing within the area.

In addition to the above, other regulations as may be imposed by the security authorities / Engineer-In charge shall be complied with / observed by the contractor and his workmen.

Any breach of above security regulations and rules in force from time to time will be viewed seriously. No claim whatsoever will be entertained by the department on account of the observations of the Security regulations.

Special Notes:

- (a) The Contractor should submit an undertaking to assume responsibility in respect of all the workers / persons deployed by him at site. In case, if it is more than 15 days, a copy of police verification certificate in respect of those all labourers / persons to be deployed at site should be furnished along with undertaking well in advance.**
- (b) The entry and exit of contractor's labourers / workers / persons should be in presence of contractors authorized supervisor who will issue muster / entry passes / identity card after proper entry in the muster at the main gate.**
- (c) It will be the responsibility of the contractor for proper safety and security of their materials including materials & labourers for which secured advances have been given by the Institute at his own cost.**
- (d) The contractor should ensure that his workers / personnel should not enter in to the other area of Institute campus other than specified as site.**
- (e) No housing colony/ labour colony will be permitted inside Institute campus. Any person/labourer will not be allowed to stay inside the Institute campus after working hours.**
- (f) No staff or worker of the contractor will be permitted to enter the premises without valid photo Identity card / entry pass duly attested by the Administrative officer of CPP-IPR.**

30. WATCH AND WARD AND LIGHTING:

The contractor shall in connection with the works provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary or as required by the Centre Director and duly constituted authority for the protection of the workers or for safety and convenience of the public or others. The contractor shall be responsible for all damages and accidents caused due to negligence in this regard. It will be the entire responsibility of the contractor to protect the work(s) carried out by them including the fittings, fixtures and other accessories provided by them till the entire work is satisfactorily handed over to the users.

31. INSTITUTE'S DRAWINGS, SPECIFICATIONS, PROTO-TYPE ETC.:

All drawings, specifications, patterns, samples, models and proto-types furnished to the contractor by the Institute are intended to be complementary and to provide for and comprise everything necessary for the completion of work/supply and are the property of the Institute. These are not to be used for any work or purpose other than those for which these have been provided and shall be returned to the Institute immediately on completion of work/supply in good condition.

32. CONFIDENTIAL INFORMATION:

The drawings, specifications, proto-type, samples and such other information furnished to the contractor relating to the supply/work, sub-systems/equipment etc. are to be treated as confidential which shall be held by the contractor in confidence and shall not be divulged to any third party without the prior written

consent of the Institute. The contractor, therefore, binds himself, his successors, heirs, executors, administrators, employees and the permitted assignees or such other persons or agents directly or indirectly concerned with the work/supply to the confidential nature of the drawings, specifications, prototype samples etc. It is a further condition of the contract that the contractor shall not, without prior written permission from the Institute, transmit, transfer, exchange, gift or communicate any such confidential information, and also the component, sub assembly, products, by-products etc. pursuant to the fabrication under taken by the contractor, to any third party.

32. (a) Patents and Patent Rights Indemnification:

All specifications, drawings, patents and such other relevant information furnished to the contractor by the Institute shall be the property of the Institute. If, during the process of execution of the contract, any improvement, refinement or technical changes and modifications are affected by the contractor, such changes shall not affect the title to the property of the Institute and all the information, specifications, drawings etc. including the improvement/modifications, affected by the contractor shall continue to be the property of the Institute. The Institute shall also have the absolute right to assign, transfer, sublet, use and transmit all such information and details to the Institute's consultants, agents and collaborators and the contractor shall not have any claim or rights whatsoever in respect of the Institute's drawings, specifications, patents, prototypes etc. even where improvement, refinement, modifications etc. were affected by the contractor.

32. (b) Endorsement to be made by the Contractor on Fabrication Drawings for the protection of Institutes Interest:

This design/drawing is the property of Institute and it must be returned with quotation or upon delivery of the materials/equipment and must not be used except with the permission of the owner.

33. JURISDICTION:

This Contract/Agreement shall be subject to the jurisdiction of courts at Guwahati only.

34. ENGAGEMENT OF SPECIALIZED AGENCIES:

Contractor should submit the credentials of Water Proofing, Anti Termite Treatment, HVAC works , Fire fighting works & Electrical Work specialized agencies to be engaged (from the list of approved make / manufacturer / vendor) by the contractor for the approval of Centre Director. For the approval the contractor should submit the complete details of agencies along with the credentials including their experience of similar works to be executed immediately on receipt of the work order.

35. LABOUR COLONY / LABOUR CAMP:

No housing colony/labour colony will be permitted inside Institute campus. Any person/labourer will not be allowed to stay inside the Institute campus.

36. TEMPORARY FENCING AROUND SITE:

Contractor should erect a temporary GI corrugated sheet fencing with MS framing of at least 6.0 ft height on Periphery of the proposed construction site to restrict the entry of laborers in the existing campus from start of the work till the completion of entire work and same shall be removed after completion of work. The quoted total amount should be inclusive of the cost for the same.

37. ENGAGEMENT OF CONSTRUCTION MANAGEMENT CONSULTANT (CMC/ PMC) FOR DAY TO DAY SUPERVISION & PROJECT MANAGEMENT:

Institute may engage project Management consultant (PMC) / Construction Management Consultant (CMC) for the day to day supervision, project management and other related activities pertaining to the project management and execution of work. In such case, PMC/ CMC shall be considered as an authorized representative of Engineer-in-Charge. The contractor has to carry out as per instruction of PMC / CMC in addition to Engineer-In-Charge. Final Authority rests with the Engineer-In-charge of the Institute.

38. VALIDITY OF QUOTED TENDER:

The quoted tender by the Tenderers shall be valid for a minimum period of 120 days from the date of opening of tender.

39. CONTRACTOR TO MAINTAIN SITE RECORDS & REGISTERS:

The Contractor should maintain all the records pertaining to the project at site such as Daily reports , Material registers & File, Drawing Register , Labour registers, site Instruction book, Test Registers , Test Report files etc. as per instructions of EIC.

The Contractor should submit the Daily report of site activities, Labours strength, Material inward, etc in the approved format to the EIC through e-mail as well as duly signed in hard copy duly countersigned by supervising agency of the Institute. The Contractors should also submit the photo Copy of material receipt Challans along with daily reports.

The said registers shall be handed over to EIC after the completion of works.

If the Institute demands the bill of any / all materials, the contractor should provide the photocopy of the bill (s) along with original bill for verification. Original bill shall be returned after verification.

40. CONTRACTOR TO ATTEND THE MEETINGS RELATED TO SITE PROGRESS:

The Contractor should attend all the periodical (Weekly or every Ten days or Fortnightly) site meetings and Progress Review meetings (Monthly) and any other the meetings related to the project as per the schedule decided by Centre Director at the Institute either at site / CPP-IPR or at Architects office as and when decided upon at his own cost. The Necessary documents /data including progress of work etc. may be submitted by the Contractor as and when asked. The meeting shall be attended by the authorized person of Contractor.

41. INCONVENIENCE TO INSTITUTE'S ACTIVITIES:

The contractor shall not deposit materials on any site which will seriously inconvenience to any of the Institute's activities. The Engineer-in-Charge may require the contractor to remove any materials which

are considered by him to be dangerous or inconvenient to the activities of the Institute or get them removed at the contractor's cost.

42. EMPLOYEES PROVIDENT FUNDS:

The Contractor shall abide by the provisions of the Employees Provident Funds and misc. provisions act 1952. The Contractor should provide the copy of registration under the above act and ensure fulfillment of the said act in addition to all the regulations mentioned in the General Clauses of contract and contractor's Labour Regulations.

43. ENVIRONMENT PROTECTION:

The Contractor should also comply following conditions related to environment protection during construction phase:

WATER:

- a) The Contractors shall make his own arrangement of water required for construction.
- b) Sewage generated during the construction phase shall be disposed off through the septic tank - soak pit.
- c) Water demand during construction shall be reduced by use of curing agents, super plasticizers and other best construction practices.

AIR:

- e) Peripheral barricading shall be done to prevent dust emission spreading outside the project premises.
- f) Water sprinkling shall be done in vulnerable areas for controlling fugitive emission.
- g) Material shall be covered during transportation to avoid the fugitive emission.
- h) The roads inside the project area and roads connected to the main road shall be paved or shall be water sprinkled to avoid the fugitive emissions during construction.
- i) The ambient air quality shall be monitored in and around the project area during construction phase.
- j) The construction materials and debris shall be properly stored and handled to avoid negative impacts such as air pollution and public nuisances by blocking the roads and public passages.

SAFETY:

- k) Structural design of the project shall strictly adhere to the seismic zone norms for earthquake resistant structures.
- l) During construction Personal Protective Equipment shall be provided to the construction workers and its usage shall be ensured and supervised.
- m) First Aid Box shall be made readily available in adequate quantity at all the times.
- n) Training shall be given to all workers on construction safety aspects.

NOISE:

- o) The overall noise level in and around the project area shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation. The ambient noise levels shall confirm to the standards prescribed under the Environment (Protection) Act and Rules.
- p) The noise generating equipments, machinery and vehicles shall not be operated during the night hours and shall be maintained properly to avoid generation of high noise due to lack of wear and tear.
- q) Use of diesel generator sets during construction phase shall be strictly with acoustic enclosure and shall confirm to EPA Rules for air and noise emission standards.

OTHER:

- r) The safe disposal of wastewater and solid wastes generated during the construction phase shall be ensured.
 - s) Barricade of adequate height shall be provided on the periphery of the construction site with adequate signages.
 - t) Vehicles hired for bringing construction material at site shall be in good conditions and confirm to applicable air and noise emission standards and shall be operated only during day time and non-peak hours.
 - u) Necessary sanitary, hygiene and first aid measures shall be provided before starting the construction activities and to be maintained throughout the construction phase.
 - v) Adequate accommodation, drinking water, sanitary facilities, first aid center, utensils and cooking fuel shall be provided for construction workers at the site.
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Salient Governing Features of the Tender / Work

Proforma of Schedules

(Applicable for Civil, Plumbing (PH) & Electrical)

SCHEDULE 'A' :		Reference to NIT & Tender Documents	
SN	TITLE	PARTICULARS	PAGE
1	Notice Inviting Tender (NIT) No.		
2	Notice Inviting Tender details	Attached	
3	Scope and location of the work:	Attached	
4	List of drawings	Attached	
5	Time Schedule for the work:	Attached	
7	Specifications:		
	a) <i>Site Grading Work :</i>	Attached	
	b) <i>Road Work :</i>	Attached	
	c) <i>Civil and Plumbing Work :</i>	Attached	
	d) <i>Electrical Work :</i>	Attached	
	e) <i>Mandatory Tests :</i>	Attached	
	f) <i>List of Approved Makes :</i>	Attached	
8	Schedule of Quantities -	Attached	<i>As per price bid</i>

SCHEDULE 'B' :		Materials to be issued to the contractor – No materials to be supplied to the contractor.		
S. No	Description of item	Quantity	Rates at which the Materials will be charged to the contractor	Place of issue
1	2	3	4	5
1.	<i>Grey Cement in bags</i>		Contractor own arrangement.	-----
2.	<i>Re-Bars for RCC</i>		Contractor own arrangement.	-----
3.	<i>Water for construction. Purpose</i>		Contractor own arrangement.	-----
4.	<i>Electricity for const. purpose</i>		Department supply on request as per conditions of contract @ Rs.8.50 per Unit.	-----

SCHEDULE 'C' :		Tools and Plants to be hired to the contractor	
S.No	Description	Hire charges	Place of issue
1	2	3	4
	<i>NIL</i>	<i>NIL</i>	<i>NIL</i>
<i>Note</i>	<i>Labour hutments / labour camp</i>	<i>No labour hutment permitted at site within campus</i>	

SCHEDULE ‘D’

Extra schedule for specific requirements / documents for the work, if any	Particularly for Security Regulations as per Conditions of contract
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SCHEDULE ‘E’ :	“Conditions & Clauses of Contract” to be followed for this work	As per Tender document
Name of Work: Site Grading Works including Roads, Storm water Drainage, Retaining wall and construction of Canteen Building at CPP-IPR, Nazirakhat, Sonapur, Assam-782402		
Estimated cost of work :		Rs. 4,52,65,000.00
i) Earnest money		Rs. 9,05,300.00
ii) Performance Guarantee		5% of tendered value
iii) Security Deposit		2.5% of tendered value

SCHEDULE ‘F’ :**General Rules & Directions :**

Officer inviting tender :	Centre Director, CPP-IPR, Nazirakhat, Tepesia, Sonapur, Assam, India. Pincode - 782402
Maximum percentage for quantity of Items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3.	See Clause-12 below

Definitions : Conditions of Contract

2(v)	Engineer-in-charge	Engineer or his representative authorized by Centre Director, CPP-IPR, who shall supervise the work
2(viii)	Accepting Authority	Centre Director, CPP-IPR
2(x)	Percentage on cost of materials and labour to cover all overheads & profits	15% (Fifteen percent)
2(xi)	Standard Schedule of Rates (SOR)	Assam PWD Schedule of Rates for the year 2013-14
2(xii)	Department / Institute	Centre of Plasma Physics – Institute for Plasma Research
9(ii)	Standard Contract Form of Deptt.	Item Rate Tender as per tender document

Clause – 1 Conditions of Contract

i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance / WO.	15 days
ii) Maximum allowable extension with late fee @0.1% per day of Performance Guarantee amount beyond the period (provided in – i) above.	7 days

Clause – 2	Authority for fixing compensation under clause 2.	Centre Director, CPP-IPR
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Clause – 5	Number of days from the date of issue of letter of acceptance / WO for reckoning date of start.	15 days
Mile stone(s) as per table given below:		

TABLE OF MILE STONE(S)

Sl. No.	Description of Milestone (Physical)	Time Allowed in days (from date of start) / LOI/Work order	Amount to be with-held in case of non achievement of milestone
	:-	-	:-
	-	-	:-
	:-	-	:-
	-	-	:-
TIME ALLOWED FOR EXECUTION OF WORK			12 Months (including monsoon period)

Authority to decide:

- | | | |
|--------|---|----------------------------|
| (vi) | Extension of time... | : Centre Director, CPP-IPR |
| (vii) | Rescheduling of mile stones | : Centre Director, CPP-IPR |
| (viii) | Shifting of start in case of delay in handing over site | : Centre Director, CPP-IPR |

Clause – 6:	Computerized Billing	
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Clause – 7:	Gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.	Monthly Running Bill
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Clause – 10A:	List of minimum testing equipments to be provided by the contractor at site lab	
	<ol style="list-style-type: none"> 1. Cube Testing Machine -1 no. 2. Sets of Sieve for Fine Aggregate and Coarse Aggregate – one set 3. Slump cone - 1 No. 4. Pressure Gauge for Plumbing line 5. Weighing Balance 5 Kg and 2 Kg- one no. each 6. Site Testing equipments for Electrical work 7. Vernier Caliper – 1 No. 8. Steel Tapes – 3 m & 30 m two nos each 9. Cube Moulds – 15 Nos. 10. Glass flasks and Metal container – as required 11. Plumb bob 	

	12. Sprit level 13. Auto level machine 14. Survey Theodolite or Total station 15. Wire Gauge circular type 16. Megger 17. Plastic Bags for samples N.A.	
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Clause – 10B(ii): Mobilization Advance	
Whether Clause 10 B (ii) (If yes, Clause of Tender Condition to be followed)	Not Applicable
Whether Clause 10 B (iii) (If yes, Clause of Tender Condition to be followed)	Not Applicable

Clause – 10C:	Component of labour expressed as percent of value of the work	25%
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Clause – 10CA:			
S. No	Materials Covered under this Clause	Nearest Materials (other than cement reinforcement bars ,the structural steel and POL) for which All India Wholesale Price Index is to be followed	Base price per MT of October 2014
1	Cement OPC	-----	
	Cement PPC	-----	
2	Steel reinforcement bars	-----	
	Structural Steel	-----	
3	POL	-----	

- Includes Cement correspondent used in RMC brought at site from outside approved RMC, if any.

Note: Base price for materials given above are only for regulating operation of clause 10-CA. The tenderers are requested to consider prevailing market rates while quoting the rates.

Clause – 10CC:	Not Applicable	Not Applicable
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Clause – 11:	
Specifications to be followed for execution of this work	Tender Specifications

Clause – 12:		
12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building work	30 %
12.5	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work	100 %

Clause – 16:	Competent Authority for deciding reduced rates :	Centre Director, CPP-IPR
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Clause – 18:	List of mandatory machinery, tools & plants to be deployed by the contractor at site: <i>(To be decided based on nature and magnitude of the work).</i>

Note: The list of machinery, tools & plants to be deployed by the contractor at site are minimum. The contractor shall deploy additional machinery, tool & plants in order to maintain the progress of the work without any extra cost to the department.

Clause – 36(i):			Requirement of Technical Representative(s) & recovery Rate			
Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical / Technical representative)	Min. Exp. In yrs.	No.	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i).
1	Degree in Engineering	Civil	Project Manager - Principal Technical Representative	15	1	Rs.34,000/-
2	Degree in Engineering	Civil	Technical Representative reporting to Project Manager	10	1	Rs.34,000/-
3	Diploma/ Degree in Engineering	Civil	Technical Representative reporting to Project Manager	5 for Diploma holder / 2 for Degree holder	1	Rs.20,000/-
4	Diploma / Degree in Engineering	Electrical	Technical representative reporting to Project Manager	5 for Diploma holder / 2 for Degree holder	1	Rs. 20,000/-

Note: Assistant Engineer retired from Government services that are holding Diploma will be treated at par with Graduate Engineers

Clause – 42:		
(i)	(a) Schedule / statement for determining theoretical quantity of cement on the basis of :	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis given in the tender
(ii)	Variations permissible on theoretical quantities.	
A	Cement	
	i) for works with estimated cost put to tender upto Rs.5 Lakhs	3% plus / minus
	ii) for works with estimated cost put to tender more than Rs.5 Lakhs	2% plus / minus
b	Bitumen for All works	2.5% plus only & nil on minus side
c	Steel reinforcement and structural steel sections	2.0% plus /minus
D	All other materials.	Nil

Annexure to clause 34(x) showing quantities of materials for area of surfacing to be considered for working out minimum period for which hire charges of road roller are to be recovered.

[illegible]

13	5 cm thick bitumen concrete surfacing using stone aggregate 4.8 Cu.m. (60% 25 mm nominal size and 40% 20 mm nominal size) per 100 m2 and coarse sand 2.4 Cu.m per 100 Sq.m. and hot cut back bitumen over a tack coat of hot cut back bitumen	370 Sq.m.
14	6cm thick bitumen concrete surfacing using stone aggregate 5.8 Cu.m. (60 % 40 mm. nominal size and 40% 25mm nominal size) per 100 Sq.m. and coarse sand 2.9 Cu.m. per 100 Sq.m. and hot cut back bitumen over a tack coat of hot cut back bitumen.	280 Sq.m
15	7.5 cm thick bitumen concrete surfacing using stone aggregate 7.3 Cu.m. (60% 50mm nominal size and 40% 40 mm nominal size)per 100 Sq.m. and coarse sand 3.65 Cu.m. per 100 Sq.m. and hot cut back bitumen over a tack coat of hot cut back bitumen.	230 Sq.m.
16	2.5 cm bitumastic sheet using stone aggregate 1.65 Cu.m. (60% 12.5 mm nominal size, 40% 10 mm nominal size)per 100 Sq.m. and coarse sand 1.65 Cu.m. per 100 Sq.m. and hot cut back bitumen over a tack coat of hot cut back bitumen.	750 Sq.m.
17	4cm bitumastic sheet, using stone aggregate 2.6 Cu.m. (60% 12.5mm nominal size 40% 10 mm nominal size) per 100 Sq.m., coarse sand 2.5 Cu.m. per 100 Sq.m. and hot cut back bitumen over a tack coat of hot bitumen.	560 Sq.m.
18	Laying full grouted surface using stone aggregate 40 mm nominal size 6.10Cu.m. per 100 Sq.m. with binder, binding with 20mm to 12.5 mm nominal size stone grit. 1.83 Cu.m. per 100 Sq.m. and seal coat of binder and stone grit 10mm nominal size, 1.07Cu.m. per 100 Sq.m., the binder being hot bitumen or tar as specified.	460 Sq.m.
19	Laying full grouted surface using stone aggregate 50 mm nominal size 9.14 Cu.m. per 100 sq.m. grouting with binder, with stone grit 20 mm to to 12.5 mm nominal size, 1.83 Cu.m. per 100 Sq.m. and seal coat of binder and stone grit 10mm nominal size, 1.07 Cu.m./100Sq.m. the binder being hot bitumen or tar.	370 Sq.m.
20	4cm. thick premix macadam surfacing using stone aggregate 25mm nominal size 4.57 Cu.m. per 100 Sq.m and hot bitumen binding with stone aggregate 12.5 mm nominal size 1.52 Cu.m. per 100 Sq.m. and seal coat of hot bitumen and stone aggregate 10mm nominal size. 1.07 Cu.m. per 100 Sq.m.	560 Sq.m.
21	5cm thick premix macadam surfacing with stone aggregate 25 mm nominal size, 6.10 Cu.m. per 100 Sq.m and hot bitumen binding with stone aggregate 12.5 mm nominal size 1.52 Cu.m. per 100 Sq.m. and seal coat of hot bitumen and stone aggregate 10mm nominal size 1.07 Cu.m. per 100 Sq.m	460 Sq.m.

SECTION - 4

SAFETY CODE

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical.)
2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.)
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder up to and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least 1%" for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.
6. (a) Excavation and Trenching - All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100 ft.) in length or fraction thereof Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.
(b) Safety measures for digging Boreholes:-
(i) if the bore well is successful .It should be safety capped to avoid caving and collapse of the bore well. The failed and the abandoned one should completely refilled to avoid caving and collapse;

- (ii) During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer-In-Charge of the work.
- (iii) Suitable fencing should be erected around the well during the drilling and after the Installation of the rig on the point of drilling, flags shall be put 50m around the point of drilling to avoid entry of people;
- (iv) After drilling the borewell, cement platform (0.5m x 0.50 m x 1.2 m) 0.60 m above ground level and 0.60 m below ground level should be constructed around well casing;
- (v) After the completion of the borewell, the contractor should cap the bore well properly by welding steel plate, cover the bore well with drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;
- (vi) After the borewell is drilled the entire site should be brought to the ground level.

7. Demolition - Before any demolition work is commenced and also during the progress of the work,

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

8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned:- The following safety equipment shall invariably be provided.

- (i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
- (ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.
- (iii) Those engaged in welding works shall be provided with welder's protective eye-shields.
- (iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- (v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measures are adhered to:

- (a) Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.
 - (b) At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.
 - (c) Before entry presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.
 - (d) Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.
 - (e) Safety belt with rope should be provided to the workers. While working inside the manholes such rope should be handled by two men standing outside to enable him to be pulled out during emergency.
 - (f) The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
 - (g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.
 - (h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.
 - (i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.
 - (j) Gas masks with Oxygen Cylinder should be kept at site for use in emergency.
 - (k) Air-blowers should be used for flow of fresh air through the manholes. Whenever called for portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.
 - (l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.
 - (m) The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.
 - (n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.
 - (o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.
 - (p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.
- (vi) The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:
- (a) No paint containing lead or lead .Products shall be used except in the form of paste or readymade paint.

- (b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scraped.
 - (c) Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.
9. An additional clause (viii) (i) of Institute Safety Code (iv) the Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form. Where ever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use:
- (i) White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.
 - (ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.
 - (iii) Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.
 - (iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
 - (v) Overall shall be worn by working painters during the whole of working period.
 - (vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
 - (vii) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by competent authority of Institute.
 - viii) Institute may require, when necessary medical examination of workers.
 - (ix) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.
10. When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.
11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions
- (i) (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.
 - (b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

- (ii) Every crane driver or hoisting appliance operator, shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.
 - (iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
 - (iv) In case of departmental machines, the safe working load shall be notified by the Electrical Engineer-in-Charge. As regards contractor's machines the contractors shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer concerned.
12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings watches and carry keys or other materials which are good conductors of electricity
- 13 All scaffolds ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.
15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer in Charge of the department or their representatives.
16. Notwithstanding the above clauses from (1) to (15) there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

SAFETY WITH SCAFFOLDINGS:

INTRODUCTION:

1. Following paragraphs deals with the safety regulations and precautions to be followed in the construction use, maintenance, etc. of scaffolds. This will serve as a guide to users of scaffolds in the construction and maintenance operation.
2. Suitable scaffolds are used for performing work that cannot be done from the ground, part of a permanent structure a ladder or other available means of support.

Scaffolds are used in many construction and maintenance operations. Fall of person is the most common hazard accompanying the use of scaffolds because of the height usually involved.

1. General Requirements:

- 1.1 Every scaffold and its supporting members should be designed to support given load, with a safety factor of at least four. No alterations should be made that might impair the strength of such structures, no improvised, make-shift or substandard scaffold should be permitted even for the most temporary use.
- 1.2 All work in connection with such structures, including construction, alteration and removal should be carefully done under the direction and supervision of persons who have had experience in such works.

2. Materials of Construction:

- 2.1 Every scaffold and every part thereof, including supports, should be of good construction, sound material, of adequate strength for the purpose which it is meant to be used and should be properly maintained. Planks should be laid flat with an overlap, lengthwise, of at least 30 cm. with the center of the overlap directly over a bearer. Boards and planks used for the floors should be of uniform thickness, closely laid and securely fastened in place.
- 2.2 All lumber used in the construction of scaffolds should be sound, straight-grained, free from cross-grains, shakes and loose or dead knots. It should also be free from dry rot, large checks, worm holes, or other defects impairing its strength or durability.
- 2.3 All nails used in the construction of scaffolds, staging and supports should be of ample size and used in sufficient quantities at each connection to develop the designed strength of scaffold. Nails should penetrate to the holding piece to a depth of at least 12 times the diameter of nail.
- 2.4 Barrels, boxes, loose tile blocks, loose piles of bricks or other unstable objects should not be used to support planks used as working platforms.

3. Platforms, Railings and Tee-Boards:

- 3.1 The minimum uniformly distributed design load per Sq. m. of platforms should be 250 kg. Any concentrated load at any point in the span should not exceed the designed uniformly distributed load. Planks should not be less than 50 mm thick.
- 3.2 The rear of outer side of every scaffolding, platform and ramp more than 2M above the surrounding ground or solid' construction, or adjacent to deep holes, excavations, railroad tracks, high tension electrical wires, should be provided with a substantial guard rail of standard construction consisting of top and intermediate rails, and toe-boards all supported by posts and securely connected to scaffold at intervals of not more than 2.4 M (See figure - 1).
- 3.3 The width of the scaffolds should be such as to provide a clear walkway 50 cm. wide. If part of the width of scaffold is to be used for keeping materials such as brick, mortar or lumber, the scaffold should be made wider so as to provide a walkway of the required width.
- 3.4 Where scaffolds are erected over sidewalks or over areas in which persons must work or pass, the space between the railing and toe-board should be fitted with side screens.
- 3.5 There should be a screen or other protection suspended from the scaffold to catch materials that may fall from above. Screens should extend beyond the edge of the scaffold to catch any materials that may fall over the edges.

4. Means of Access:

- 4.1 A safe and convenient means of access should be provided to the platform or scaffold. This requirement does not apply to swinging scaffolds or those with convenient access from adjacent floors (see figure - 2). Means of access may be a portable ladder. Fixed ladder, ramp or it may be a stairway. The use of cross braces or frame work as means of access to the working surface should not be permitted.
- 4.2 If scaffolds are to be used to a great extent or for a long period of time, a regular plank stairway, wide enough to allow two persons to pass, should be erected. Such stairways should have handrails on both sides.
 - 4.2.1 No stairway or run of slope exceeding 2 in 3 should be used.
 - 4.2.2 Where the slope of a stairway or run renders additional foot hold necessary, and in every case where the slope is more than 1 in 4, there should be provided proper stepping laths which should:
 - (a) have a minimum section of 50 x 30 mm and be placed at maximum interval of 45 cm and
 - (b) be of length to cover the full width of the stairway of run except that they may be interrupted over a width of not more than 10 cm to facilitate the movement of barrows.

5. Overhead Protection:

- 5.1 Overhead protection should be provided on the scaffold whenever persons are working at higher places. This protection should be not more than 3m above the scaffold floor and should be of planks or other suitable materials.

6. Use of Scaffolds:

- 6.1 Good housekeeping should be maintained at all times upon scaffolding, platforms and ramps. Excessive storage of materials thereon should be avoided. Care must be taken to avoid accumulating of small objects, such as boards, tools, pieces of reinforcing steel, waste concrete which may easily be disturbed or knock off. Hand rails should be kept in good repair and securely nailed or otherwise fastened down. Scaffold should be cleared of all tools, materials and rubbish at the end of each working day/shift.
- 6.2 Persons should not be permitted on scaffolds when the platform or guard rails are slippery. Persons should not be permitted to work on scaffolds during a storm or strong winds.
- 6.3 Suspended scaffolds should never be used for the storage of stone or heavy materials. Two or more swinging scaffolds should not at any time be combined into one by bridging the distance between them with planks or any other form of connection. Life lines securely fastened from above should be provided for each person working on a swinging scaffold. Safety belts should be tied to the life lines (See figure - 3).

7. Inspection:

- 7.1 As scaffolds have to remain in position normally for many weeks, they must be inspected at least once a week to make sure that nothing has gone wrong since erection. In addition, they must always be inspected after a spell of bad weather which might have affected their stability.
- 7.2 The inspections must be carried out by someone who knows the faults to look for and how they may be put right. It is important to know that the work of inspection has been completed and what faults have been found, the results of each Inspection must, therefore be recorded. Any scaffold damaged or weakened from any cause should be immediately repaired and persons should not be allowed to use it until repairs have been completed.

8. Dismantling:

- 8.1 The dismantling of scaffold should be carefully done under experienced supervision. Care should be taken not to drop small, loose objects when removing scaffold planks. All nails should be promptly removed from scaffold planks and the planks safely piled.

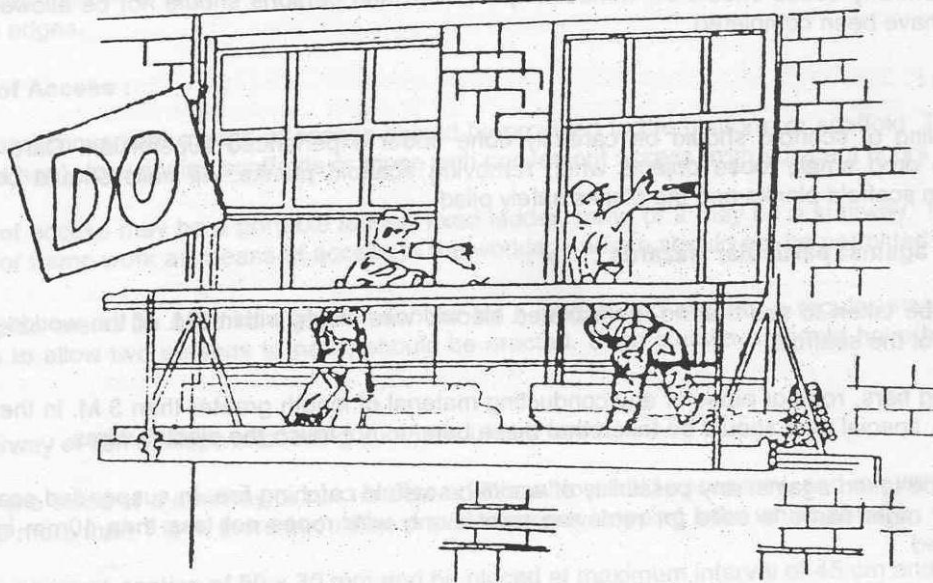
9. Precautions against particular Hazards:

- 9.1 Care should be taken to see that no un-insulated electric wire exists within 3M. of the working platform, stairway etc. of the scaffold.

- 9.2 While carrying bars, rods or pipes of any conducting material of length greater than 3 M. in the vicinity of electric wires, special care should be taken that these bars do not touch the electric wires.
- 9.3 Care should be taken against any possibility of wooden scaffold catching fire. In suspended scaffolds, if a blow torch or other flame is used for removing paints, only wire ropes not less than 10mm in diameter should be used.
- 9.4 Care should be taken to see that no part of a scaffold is struck by a truck or other heavy moving equipment and no material should be dumped against it.
- 9.5 Scaffolds on thoroughfare should be provided with light.
- 9.6 Access to cable tunnels, hydrants, etc. should remain free at all times.
- 9.7 Care should be taken from damaging underground cables and equipment. This is especially important when parts of scaffolds for other fasteners have to be driven in the ground.

• GUARD RAILS •

THE REAR ON OUTER SIDE OF THE SCAFFOLD SHOULD BE PROVIDED WITH A SUBSTANTIAL GUARD RAIL OF STANDARD CONSTRUCTION



PERSONS SHOULD NOT BE ALLOWED TO WORK ON SCAFFOLDS WHERE THE EDGES ARE UNGUARDED. A SLIGHT SLIP WILL RESULT IN SERIOUS INJURY OR EVEN DEATH

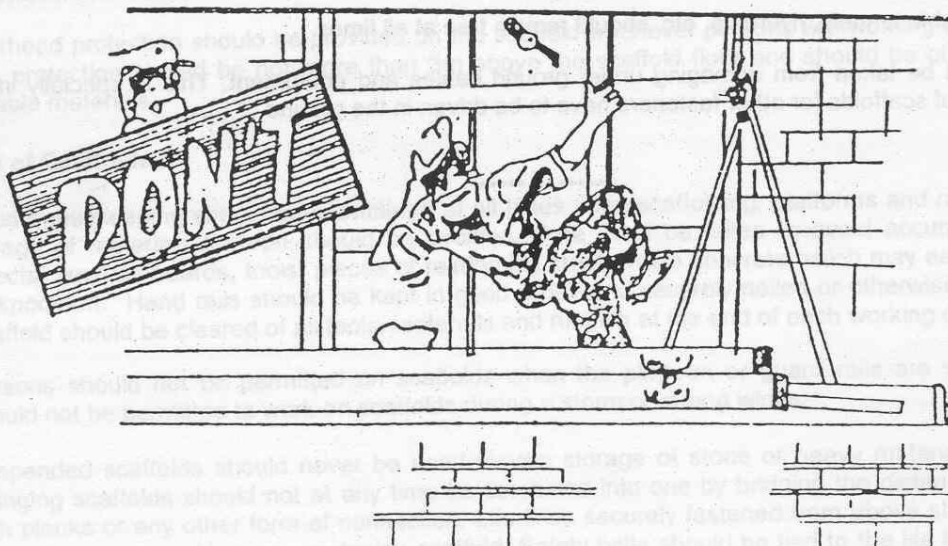
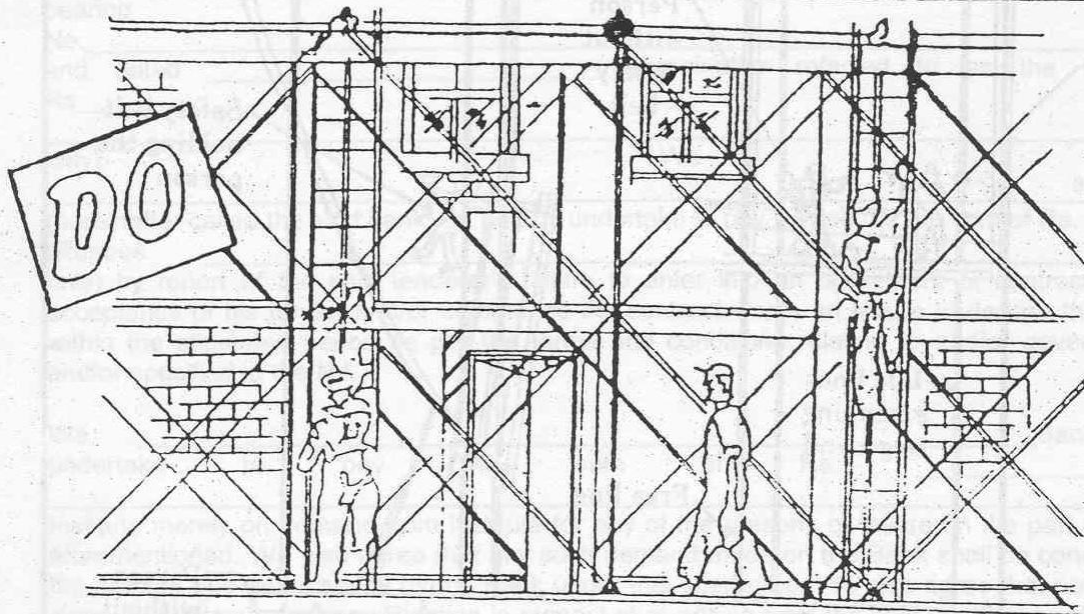


FIGURE — 1

FROM INDUSTRIAL SAFETY CHARTS-US DEPT. OF LABOUR.

• ACCESS •

A SAFE CONVENIENT MEANS OF ACCESS SHOULD BE PROVIDED TO THE SCAFFOLD



THE USE OF CROSS BRACES OR FRAME WORK AS MEANS OF ACCESS TO THE WORKING SURFACE SHOULD NOT BE PERMITTED

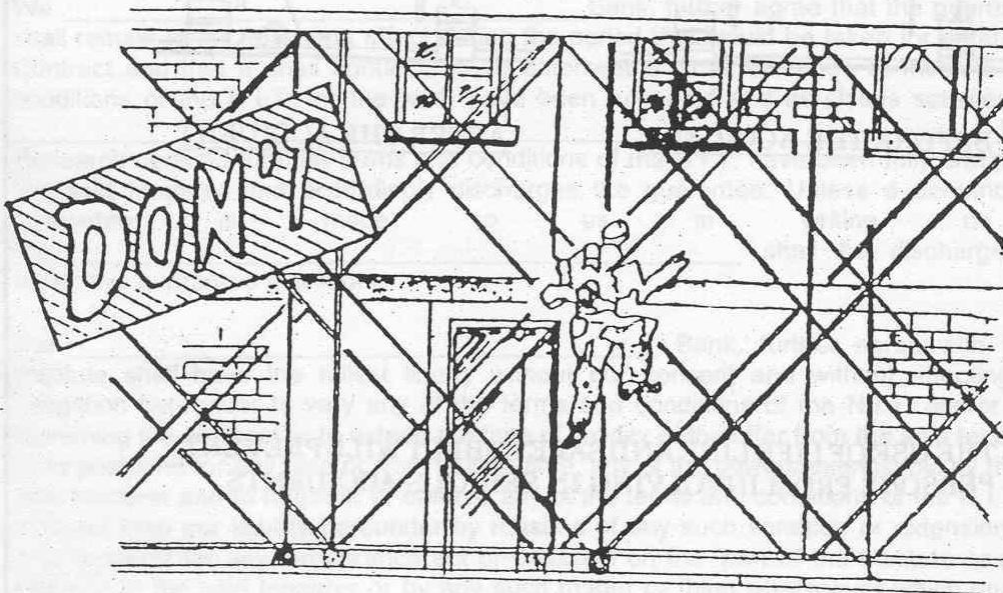
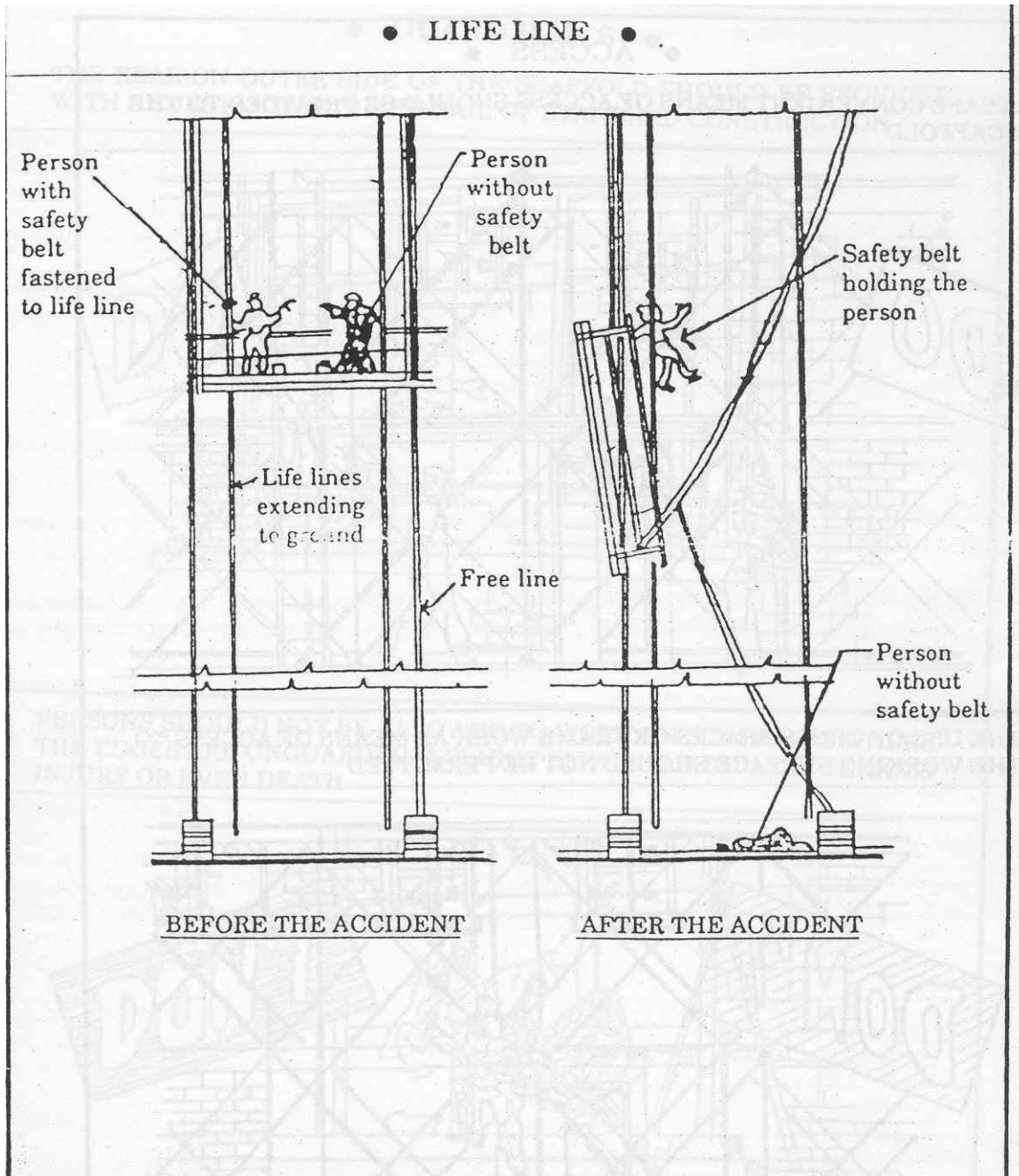


FIGURE — 2

FROM INDUSTRIAL SAFETY CHARTS-US DEPT. OF LABOUR.


• LIFE LINE •



THE USE OF LIFE LINE AND SAFTEY BELT WILL PREVENT
PERSON FORM INVOLVING IN SERIOUS ACCIDINT

IPR Additional Safety Code

Note: In case of discrepancy between Safety Code, Safety with Scaffolding and IPR Additional Safety code, the stringent one shall be followed.

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY PROTOCOL FOR CONTRACTORS OF CIVIL/CONSTRUCTION AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

1. PURPOSE:

The purpose of this protocol is to establish, implement and execute a safe and effective program for the prevention of incidents that may cause injury to persons or damage to the property. The specified responsibilities remain with the contractor for compliance.

1. SCOPE:


- 1.1 This protocol shall be considered minimum requirements necessary for all works performed inside the Institute for Plasma Research (IPR) and associated centres/units/departments.
- 1.2 All the contractor while at IPR and associated centres/units/departments work site are required to ensure that themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors, must comply with the provisions of this protocol.
- 1.3 The contractor shall review and educate their workers and employees about the stipulations of this protocol.
- 1.4 This protocol is in addition to the responsibility of the contractor towards safety, health and environmental compliance envisaged under law, code or statutory requirements.

2. PROTOCOL:

- 2.1 The contractor has to provide appropriate Personal Protective Equipments (PPE) like safety shoes, safety helmets, goggles, hand gloves, full body safety harnesses, etc. as required for safety of themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors at site. All PPE must conform to relevant Indian and/or International Standards. These should be maintained in recommended condition by suitable storage, maintenance and inspection. IPR shall have right to examine the PPE and determine their suitability, reliability, acceptability and adaptability.
- 2.2 The contractor shall provide and maintain proper illumination, fencing, guards, stairs, ladders, scaffolding, warning signs, caution boards, etc. as required to ensure safe working conditions at site.
- 2.3 The contractor shall ensure that all floor and wall openings are fixed and properly guarded/barricaded during the course of work and at the end of each day's work with appropriate caution board.
- 2.4 The contractor must adhere to the requirements of Safety, Health and Environment (SHE) Policy of IPR, salient features of which are:
 - a. Continual improvement in its Safety, Health & Environment Performance,
 - b. Conservation of natural resources,
 - c. Waste minimization,
 - d. Compliance with applicable statutory and regulatory requirements,
 - e. Creating safety & environmental awareness to its employees and associates.

- 2.5 The contractor has to ensure to employ only persons who are medically fit and having sufficient skills for execution of work. The contractor must ensure efficient job supervision through educated, qualified, experienced and responsible supervisors to ensure safety at site.
- 2.6 All staff persons including workers must undergo Safety Induction Training prior to depute them at IPR and associated centres/units/departments for any kind of work. Training module may include video film, clippings, photographs etc. related to work execution. In addition to this, Job specific training must be imparted to the concerned workers periodically.
- 2.7 The contractor has to ensure that Daily Tool Box Talk shall be conducted at least for new workers by responsible work in-charge/supervisor for each activity and its record to be maintained.
- 2.8 The contractors themselves, their workers and employees, sub-contractors, if any, shall comply with the instructions given by the Safety Officer or his authorized nominee or IPR's representative regarding safety precautions, protective measures, housekeeping requirements, etc. IPR shall have the right at its sole discretion to stop the work, if the work is being carried out in such a way that it may cause accidents or harm to the workers or damage to the equipments. Contractor shall get the unsafe condition removed and report to IPR.
- 2.9 The contractor shall have no right to claim any damages/compensations for stoppage of work due to safety reasons as provided in para 3.8 .The period of such stoppage of work will not be taken as an extension of time for completion of work or exemption from liquidated damages/compensation delay.
- 2.10 The contractor should ensure that water, fuel and energy are used judiciously. The water & power points must be closed / put off when not in use.
- 2.11 Good housekeeping practices must be followed strictly. .
- 2.12 All equipments used for construction, fabrication and assembly work, etc. by the contractor must meet Indian/International standards. In case such standards do not exist, the contractor must ensure these to be absolutely safe. All equipments shall be strictly operated and maintained in accordance with manufacturers' operation manual and safety instructions.
- 2.13 The contractor must not interfere or disturb electric, fuses, cables and other electrical equipments belonging to IPR or another agency under any circumstances whatsoever unless expressly permitted in writing by IPR.
- 2.14 Contractor shall arrange adequate facilities for first aid, medical aid and treatment for his staff and workers engaged at the work site.
- 2.15 The contractor has to fully be responsible for the behaviour and conduct of themselves, their workers and employees and sub-contractors. Any cost of loss or damage to client's property caused by contractor's employees or workers will be recovered from the contractor.
- 2.16 In case of any accident that occurs during the maintenance/ fabrication/erection or associated activities undertaken by the contractor thereby causing any minor or major or fatal injury to themselves, their workers and employees, sub-contractors due to any reason, it shall be the responsibility of the contractor to promptly inform IPR's Work in-charge and Safety Officer in prescribed form of IPR. This should also be informed to statutory authority, if required, under the applicable laws. The contractor shall maintain a register of accidents.
- 2.17 In case the contractor fails to fulfil statutory requirements, IPR shall have the right to withhold contractors payments till the requirement are fulfilled.
- 2.18 The contractor shall plan his activities so as to avoid interference with the assignments of other departments and contractors at the site. In case of any interference, necessary coordination must be sought by the contractor from IPR for safe and smooth working.
- 2.19 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions or as recommended by Safety Officer of IPR must be made by the contractor to extinguish fires.
- 2.20 The contractor shall issue photo identity card for themselves, their workers and employees, sub-contractors to be deployed at site. They are required to be displayed prominently during the period of their stay within IPR and associated centres/units/departments.

- 2.21 The contractor shall obtain gate pass from IPR and associated centres/units/departments for entries and exists of all materials and equipments.
- 2.22 Smoking and eating/chewing of tobacco is strictly prohibited at site.
- 2.23 Any person under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted at work site.
- 2.24 Person below the age of 16 years must not be employed for any work at site. But, it is always suggested to employ the person of minimum 18 years old.
- 2.25 IPR may from time to time, add or amend to these protocols and issue directions.
- 2.26 The contractor shall comply with Safety Instructions as laid down in as per Annexure-I.

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY INSTRUCTIONS FOR CONTRACTORS OF CIVIL/CONSTRUCTION AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

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1. GENERAL INFORMATION

- 1.1** The purpose of safety instruction document is to establish, implement and execute a practical and effective method for preventing accidents, injuries and property damage.
- 1.2** This document will help contractors and their associates to recognize, evaluate and control hazardous activities within their areas of responsibility.
- 1.3** This document defines the procedure with which safety practice will be administered, identifies responsibilities and ensures control of work area safety.
- 1.4** Contract agreement signed with contractors and the provisions of this document are intended to complement each other to ensure safe working conditions.
- 1.5** The provisions of this document apply to IPR and associated centres/units/departments.
- 1.6** Throughout this document, reference to a contractor means the contractor's company and the associated subcontractors, consultants, vendors and suppliers. Reference to contractor's management means personnel responsible for managing, supervising or directing contract activities and employees.
- 1.7** Non-compliance of this document is treated as non-compliance of contract agreement that may result in warning/penalty. Willful or repeated non-compliance may result in contractor dismissal and contract termination.
- 1.8** This document for contractors is a supplementary document to statutory rules, codes and regulations having jurisdiction, and does not negate, abrogate or minimise any provisions of these rules, codes and regulations. It is intended to supplement and enforce the individual program of the contractor and to coordinate the overall safety effort. Contractors are responsible for the safety and health of their employees, subcontractors, consultants, vendors, suppliers, and visitors while in IPR and associated centres/units/departments.
- 1.9** Contractor's managers and supervisors are responsible for preventing incidents or conditions that could lead to incidents, injuries, illness or fatalities. The ultimate success of the safety program depends on the cooperation of everyone. The contractor's management must ensure that safety provisions are enforced and that effective training and education programs are employed.

2. ROLE OF THE CONTRACTOR

2.1 Top Management of the Contractor

The commitment of top management of the contractor towards safety is very important. Top management needs to ensure the following:

- 2.1.1** To implement safe methods and practices, deploy appropriate machineries, tools & tackles, experienced supervision and skilled workforce, etc. required for execution.
- 2.1.2** To ensure that employees and workers deployed are physically and mentally fit. They should possess requisite skill, qualification, experience etc.
- 2.1.3** To deploy qualified and trained safety supervisor, safety officers and/or safety manager reporting to site In-charge for supervision, co-ordination and liaison for the implementation of safety.
- 2.1.4** To ensure that the employees and workers have appropriate health and safety training. The certification of such training should be produced for verification, on demand.
- 2.1.5** To obtain all necessary and applicable licences, permits, and insurance policy of his employees and workers before executing any work. A copy of the same must be submitted to the relevant authority at IPR.

- 2.1.6 To ensure that all incidents (minor/major injuries, fatality, fire, property damage etc.) including near misses shall be reported to the relevant authority at IPR immediately verbally as well as in written format of IPR. Also, keep record for the same.
- 2.1.7 The liability for any compensation on account of injury sustained by an employee of the contractor will be exclusively that of the contractor.
- 2.1.8 To provide personal protective equipments required for the safety and first-aid kits at worksite.
- 2.1.9 To maintain appropriate records of all employees and workers deployed to carry out the work at site.
- 2.1.10 Contractor shall not employ any labour below 18 years of age.
- 2.1.11 A photo gate pass duly approved by IPR administration shall be issued by the contractor to their personnel, employees, subcontractors, etc.
- 2.1.12 To co-operate with all the security arrangements of IPR.
- 2.1.13 Contractor may ask for clarifications required in safety related issues, whenever a need arises.
- 2.1.14 To follow and implement all the safety rules and regulations of the local bodies, state, national and international. Contractor shall also comply with all the statutory requirements and notifications, as applicable, in relation to employment of his employees issued time to time by the concerned authorities.

2.2 Contractor Safety Officer, Safety Supervisor and/or Job Supervisor

The duties and responsibilities of the contractor safety officer, safety supervisor and/or job supervisor shall include the following:

- 2.2.1 To assess the hazards associated with work at site in consultation with all concerned and establish safe working procedure.
- 2.2.2 To establish a written records of factors that can cause injuries, illness or other safety related problems.
- 2.2.3 To undertake routine/surprise inspections of all work sites to ensure compliance with safety standards, codes, rules, regulations and orders applicable to the work concerned.
- 2.2.4 To check whether the proposed working arrangements/procedures are safe and satisfactory, particularly at the interface between contractors planned work and IPR facilities.
- 2.2.5 To ensure that required guards and protective equipment are provided, used and properly maintained.
- 2.2.6 To ensure that the workers understand the working procedures for carrying out the work safety and the hazards that may be encountered.
- 2.2.7 To take immediate actions to correct any violation of safety rules observed or reported.
- 2.2.8 To ensure that appropriate warning signboards and tags are displayed.
- 2.2.9 To report each incident and/or injury in accordance with established procedures and assists during investigation.
- 2.2.10 To arrange tool box meeting daily and shall continue this process to make workmen safety conscious. To keep a constant liaison with the relevant authority at IPR on safety issues.

2.3 Contractor Employees

The duties & responsibilities of the contractor employees should include the following:

- 2.3.1 The contractors' employees must be trained for safety standards, procedure to carry out high risk job (if involved), use of Personal Protective Equipments (PPEs) in general and specific for a particular job, emergency preparedness and fire extinguisher and medical first-aid.
- 2.3.2 To perform work safely as per the job requirements/instructions and wear appropriate PPEs.

- 2.3.3 To inform promptly to their management regarding all work related incidents resulting in personal injury, illness and/or property damage, etc.
- 2.3.4 To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

3. PENALTY FOR NON-COMPLIANCE

The following penalties shall be imposed on the contractor by the IPR and shall be deducted from his running/final bill.

Sr. No.	Non-Compliance/Violation of Safety Protocols/Rules/Norms	Penalty
1.	Non-use of PPE like Safety Helmet / Safety Shoes etc.	Rs. 100 per day/person
2.	Over speeding (> 30Km/Hr) / rash driving or improper parking	Rs. 100 per occasion
3.	Non-use ELCB/MCB, Use of non-standard socket, poor cable joint, laying wire/cables on floor, non-use of socket, electrical jobs by incompetent person	Rs. 200 per day/case
4.	Working at height without full body safety harness, using non-standard scaffolding and not arranging fall protection arrangement	Rs. 500 per day/case
5.	Handling of compressed gas cylinders without trolley and double gauge regulator, Improper keeping/storage of gas cylinder	Rs. 200 per day/case
6.	Use of domestic LPG for cutting purpose.	Rs. 200 per day/case
7.	No fencing/barricading of excavated/open areas.	Rs. 200 per day/case
8.	No provision of firefighting equipment during hot works. Use of firewater for purpose other than firefighting.	Rs. 200 per day/case
9.	No reporting of Nearmiss/First-aid/Injury/Property damage/Minor fire etc. incidents	Rs. 500 per case
10.	Poor Housekeeping	Rs. 200 per day/case
11.	No deployment of safety officer/safety supervisor responsible for safety at work site as mentioned in Chapter No. 5	Rs. 500 per day

Safety Officer or any other officer authorized by IPR will report safety violation to the concerned Engineer In-charge for imposing necessary penalty. Engineer-in-charge shall ensure that the penalty amount has been deducted from the running bill of contractor. Imposing any penalty for violation of safety norms does not absolve the contractors from their contractual obligation/ responsibility. Contractor shall be fully responsible for any accident and/or injury to their employees or property due to violation of safety norms.

4. PROVISION FOR SAFETY SUPERVISOR /SAFETY OFFICER OF CONTRACTOR

The contractor shall depute at least one Safety Supervisor / Safety Officer for critical activities as follows,

- i. Any excavation more than 1.5 mtr. depth
- ii. Work at height (working beyond 2.5 mtr. above ground)
- iii. Materials and Material Handling which includes movement of material by crane, movement of

tractor trolley on slopes, etc.

- iv. Working near high voltage lines, electrical installations, etc.
- v. Painting at height (beyond 2.5 mtr. above ground) and painting at confined space

In addition to above list, IPR may also recommend for some specific tasks, which are not covered, to depute Safety Officer/Safety Supervisor.

Safety supervisor shall be qualified of minimum Diploma in Engineering/ Graduate in Science with approved course in the field of safety and/or fire. He shall able to read and understand English and speak regional/national language. He shall have experience as safety supervisor for a period of minimum one year.

Safety Officer shall be qualified of minimum Bachelor in Engineering/ Post Graduate in Science with approved course in the field of Safety and/or Fire. Safety Officer shall have good communication and written skill to liaison with the client. He shall have good command in English and regional/national language. He shall have experience for a period of minimum three years of supervisory level.

5. GENERAL SAFETY PROVISIONS

5.1 Personal Protective Equipment

The contractor is responsible to provide all necessary standard make (ISI marked) personal protective equipment (PPE) suitable to give sufficient protection against hazards involved in their work / job to their employees, as per the job requirement and insist/enforce their staff to put on the same while at works and ensure that the PPEs are properly used and maintained in a condition suitable for immediate use. The contractor shall have sufficient stock of various PPEs to avoid any shortage of supply and shall take adequate steps to ensure proper use of equipment by those concerned. The ongoing work is liable to be stopped at any time if the contractor's staff is found working without PPEs.

- 5.1.1 All persons employed at site shall use safety helmets. For other types of works, persons working in that area shall also use safety helmets, if advised by Safety Engineer/Engineer-In-Charge.
- 5.1.2 Persons engaged in welding and gas-cutting works shall use suitable welding face shields. The persons who assist the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- 5.1.3 All persons working at heights more than 2.5 m above ground or floor and exposed to risk of falling down shall use full body safety harness, unless otherwise protected by cages, guard railings, etc. In places where the use of safety harness is impractical, suitable net of adequate strength fastened to substantial supports shall be employed.
- 5.1.4 When workers are employed in sewers and inside manholes, which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. After it has been well ventilated, the atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the register before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

5.1.5 The following is the list of various PPEs to be used for various works/worksites,

List of Safety Equipment's

Sr. No.	PPE	Purpose
01	Industrial Safety Helmet	For protection of head against falling objects or during fall of person from height.
02	Safety Goggles (Grinding, Welding, etc).	For protection of eyes against flying particles / dust, chemical splash, spark, arc, flashover etc.
03	Face shield	For protection of face against flying particles / dust, chemical splash, spark, arc, flashover etc.
04	Ear plug / Ear muffs	For ear / hearing system protection while working in high noise level area.
05	Apron (PVC /cryo/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cryo, Electrical shock proof)	For protection of hands against chemicals, oils, cryogenics, sharp edged objects, heat, hot metals/objects, electricity etc.
07	Safety Shoes	For protection of leg/feet against falling objects, sharp edged objects, heat, hot metals/objects, electricity etc.
08	Full body safety harness/I Rope /Life line/ Fall prevention system etc.	For fall prevention while working at heights or in depth, working in vessel or in confined space.
09	Dust Respirator	Protection of respiratory system against dust.
10	Self-contained breathing apparatus (SCBA) set	Working in oxygen deficient areas.

5.2 Electricity

The following are provided for general guidance of the Contractor and shall be read as specific requirement, in addition to complying with Indian Electricity Act, Indian Electricity Rules and IS Specifications.

5.1.5 Only qualified electricians familiar with code requirements are allowed to perform electrical work.

5.1.6 Employees are not permitted to work near an unprotected electrical power circuit unless they are protected against electrical shock by de-energizing the circuit and grounding it, or are protected by effective insulation or other means, and are wearing .required personal protective equipment.

5.1.7 The electric power supply will be generally made available at one point in the works site of the contractor by the IPR.

5.1.8 All three phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.

5.1.9 All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.

5.1.10 The contractor shall not connect any additional load without prior permission of IPR.

5.1.11 Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However tappings from an earth bus may be done.

5.1.12 Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.

5.1.13 Materials for all electrical equipment shall be selected with regard to working voltage,

load and working environment. Such equipment shall conform to the relevant standards.

- 5.1.14 Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses be used in all circuits. For load of 5 KW or more earth leakage circuit breaker of proper rating shall be provided in the circuits.
- 5.1.15 Wires and cables shall be properly supported and approved method of fixing shall be adopted. Cables shall not be left on floor/ground. Loose hanging of wires & cables shall be avoided. Lightning and power circuits shall be kept distinct and separate.
- 5.1.16 Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- 5.1.17 All cables and wires shall be adequately protected mechanically against damages. In case, the cable required to be laid underground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC), tile or any other approved means.
- 5.1.18 All armoured cables shall be properly terminated by using suitable cable glands. Multi-stranded conductor cables shall be connected by using cable lugs/ sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- 5.1.19 All the Distribution Boards, Switch Fuse units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and waterproof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible.
- 5.1.20 The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all switch boards, equipment etc. against rain.
- 5.1.21 Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply, when repair or maintenance work has to be done.
- 5.1.22 All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron framework shall be used.
- 5.1.23 Only PVC insulated and PVC sheathed wires or armored PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- 5.1.24 All portable appliances shall be provided with three-core cable and three-pin plug. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.

5.3 House Keeping

- 5.1.5 The Contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment so as not to create unsafe condition or fire hazard.
- 5.1.6 Welding and other electrical cables shall be properly routed.
- 5.1.7 No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
- 5.1.8 Cleaning of the work area at the end of the day and upon completion of work is a part of the

job.

- 5.1.9 The Engineer-in-charge has the right to stop work if the Contractor fails to improve upon the housekeeping after having been notified.

5.4 Fire Safety

- 5.1.5 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions shall be made to extinguish fires, if it still breaks out.
- 5.1.6 Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be kept minimum in order to avoid unnecessary accumulation of combustibles at site.
- 5.1.7 Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
- 5.1.8 Fire extinguishers shall be located at the site at appropriate places.
- 5.1.9 Adequate number of workmen shall be given education and training in firefighting and extinguishing methods.

5.5 Scaffolding

Accidents are also caused by the ladders falling or the climber losing his balance or failure of scaffolds. As such, utmost care should be taken as ladder and scaffolding are extensively used for maintenance and construction purpose. Some of the safe practices as listed below are to be observed before commencement of work.

- 5.5.1 Adequate and safe means of access and exit shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevations shall not be permitted.
- 5.5.2 Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal and all ladders shall be maintained well for safe working condition.
- 5.5.3 Short ladder must not be tied together to give greater lengths. All ladders of 6 m or above should be tied to the structure on which they are resting to prevent from. An extra worker shall be engaged for holding the ladder if ladder is not securely fixed. If the ladder is used for carrying materials, suitable foot holds and handholds shall be provided on the ladder. The ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical). Ladders shall not be used for climbing carrying materials in hands. While climbing both the hands shall not be free.
- 5.5.4 The free length must extend by 1.5 meters above the point of landing but should not be more than $1/4^{\text{th}}$ of the ladder length. No portable single ladder shall be over 9 meter in length. Metal ladders may not be used for electrical work.
- 5.5.5 Scaffolding or staging more than 3.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a standard guard rail properly attached, bolted, braced or otherwise secured at least 1.0 m high above the floor or platform of such scaffolding or staging. The guard rail shall extend along the entire exposed length of the scaffolding with only such opening as may be necessary for the delivery of materials. Standard railing shall have posts not more than 2 m apart and an intermediate rail

halfway between the floor or platform of the scaffolding and the top rail. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure. Scaffolding and ladder shall conform to relevant IS specification (IS: 3696). Timber/Bamboo scaffolding shall not be used.

- 5.5.6 Working platforms of scaffolds shall have toe boards at least 15 cm in height to prevent materials from falling down.
- 5.5.7 Every part of scaffolding must be of sound construction. Steel planks used in scaffolds should be carefully inspected and should be tied on both sides with suitable fixing arrangements to the pipes. Scaffolding must not be overloaded.
- 5.5.8 The Steel pipe & clamp to be used must be of good quality. The spacing between the vertical & horizontal members of the scaffolding should not be more than 1.5m and 1 meter respectively. The scaffolding should be further strengthened with cross bracing and stays.
- 5.5.9 The scaffolds should be provided with short climbs ladders for safe ascending/ descending of workmen in the job. Only those workmen who are well trained/ experienced in erecting scaffolding should be engaged for scaffolding work. The men working in the actual erection/dismantling of the scaffolding and all persons using the scaffolding must use appropriate PPEs.
- 5.5.10 A sketch of the scaffolding proposed to be used shall be prepared and approved by the Engineer-in charge, prior to start of erection of scaffolding. All scaffolds shall be examined by Engineer-In-Charge before use.
- 5.5.11 Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally and if the height of the platform or gangway or stairway is more than 3.5 m above ground level or floor level, they shall be closely boarded, shall have adequate width for easy movement of persons and materials and shall be suitably guarded.
- 5.5.12 The planks used for working platform shall not project beyond the end supports to a distance exceeding four times the thickness of the planks used. The planks shall be rigidly tied at both ends to prevent sliding and slippage. The thickness of the planks shall be adequate to take load of men and materials and shall not collapse.
- 5.5.13 Each opening in the floor of a building or at a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing.
- 5.5.14 Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9 m in length. For ladders up to 3m in length the width between side rails in the ladder shall in no case be less than 300 mm. For longer ladders this width shall be increased by at least 20 mm for each additional meter of length. Step spacing shall be uniform and shall not exceed 300 mm.
- 5.5.15 Adequate precautions shall be taken to prevent danger from electrical lines and equipment. No scaffolding, ladder, working platform, gangway runs, etc. shall exist within 3 meters of any uninsulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipments are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

5.6 Excavation, Trenching and Earth Removal

All excavation work should be planned. The method of excavation and type of support work required should be decided considering the stability of the ground & effect on adjoining buildings, roads, underground pipes, cables or any other structures.

- 5.1.5 All excavation work should be supervised by responsible person and inspected for any defect regularly.

- 5.1.6 Safe angle of repose while excavating trenches exceeding 1.5m depth up to 3.0m should be maintained. Based on site conditions, provide proper slope, usually 45° and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave-in or slides. The excavated material shall not be placed within 1.5 m of the edges of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances mining or under-cutting shall be done.
- 5.1.7 All trenches 1.2 m or more in depth shall be supplied with at least one ladder for each spacing of 30m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1.0 m above the surface of the ground.
- 5.1.8 Open excavations shall be fenced off by suitable railing and warning signals installed, so as to prevent persons slipping or falling into the excavations. Don't allow vehicles to operate too close to excavated area. Barricade should be provided.
- 5.1.9 The Contractor shall ensure the stability and safety of the excavation, adjacent structures, services and the works.

5.7 Concreting

Shuttering and supporting structures shall be of adequate strength and approved by Engineer-In-Charge. This shall be ensured before concrete is poured. The procedure approved by Engineer-In-Charge shall be followed for mixing, transporting and pouring of concrete.

5.8 Demolition

Before any demolition work is commenced and also during the progress of the work:

- 5.1.5 All roads and open area adjacent to the work site shall either be closed or suitably protected. Appropriate warning signs shall be displayed for cautioning approaching persons.
- 5.1.6 Before demolition operations begin, the Contractor shall ensure that the power on all electric service lines is shut off and the lines-cut or disconnected at or outside the demolition site. If it is necessary to maintain electric power during demolition operation, the required service lines shall be adequately protected against damage. Persons handling heavy materials/equipments shall wear safety shoes.
- 5.1.7 No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.
- 5.1.8 Entries to the demolition area shall be restricted to authorized persons only.

5.9 Welding and Gas Cutting

- 5.1.5 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.
- 5.1.6 Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.
- 5.1.7 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.
- 5.1.8 Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on persons or flammable materials. Adequate ventilation shall be provided while welding in confined space.

- 5.1.9 Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter glasses of appropriate shade shall be worn as face protection.
- 5.1.10 Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied, cleaned thoroughly and it is made certain that no flammable material is present.
- 5.1.11 Fire extinguisher shall be available near the location of welding operations. Prior permission shall be obtained from safety section for working at vulnerable areas and operating areas before flame cutting/welding is taken up.
- 5.1.12 Tarpaulin, if used should be of fire retardant.
- 5.1.13 For electric (Arc) welding the following additional safety precautions shall be taken:
- When electrical welding is undertaken near pipe lines carrying flammables, such pipe lines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.
 - Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.
 - Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
- 5.1.14 The cylinders containing poisonous/toxic or inflammable / explosive gas like Oxygen, Acetylene, Hydrogen, Ammonia, Chlorine, CO₂ etc. shall be handled safely taking due cares. To handle / shift such cylinders a special trolley / cage meant for it must be used but in no case it should be rolled.
- 5.1.15 No domestic LPG cylinder is allowed for Hot Work such as Gas Welding / Gas Cutting.
- 5.1.16 A person must remain in the area for a minimum period of 30 minutes after hot work is completed to ensure the site is safe. Welding machine shall be switched off after the completion of work.

5.10 Grinding

- 5.1.5 All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- 5.1.6 Grinding wheels of specified diameter only shall be used on a grinder- portable or pedestal - in order not to exceed the prescribed peripheral speed.
- 5.1.7 Goggles shall be used during grinding operation.

5.11 Painting

- 5.1.5 The Contractor shall not employ women on the work of painting with products containing lead in any form. Only men above the age of 18 years shall be employed on the work with lead paint.
- 5.1.6 Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national/regional language, "SMOKING - STRICTLY PROHIBITED" shall be displayed in the vicinity where painting is in progress or where paints are stored.
- 5.1.7 When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. If adequate ventilation cannot be provided, workers shall wear suitable respirators.
- 5.1.8 Epoxy resins and their formulations used for painting shall not be allowed to come in contact with the skin. The workers shall use plastic gloves and/or suitable barrier creams.
- 5.1.9 Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.

6. REPORTING FORM

6.1 Near Miss Reporting Form

(This form may be filled and submitted to the Safety Section within 48 hours from the incident time)

1. Name of Person Affected/Observed Near miss:	2. Group/Division/Section:
3. Designation:	4. Location of Near Miss:
5. Date & Time of Near Miss:	6. Contact no:/Ext. No.:
7. Near Miss Description: <i>(Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)</i> ----- ----- ----- ----- ----- ----- -----	
8. Possible Damage that might have happened: (i) (ii)	
9. Corrective Actions Proposed to prevent reoccurrence of such near miss incident(s):	

Submitted By:

Signature:

Name:

Date:

6.2 Incident Reporting Form

(This form is to be filled and submitted for all incidents except near miss to safety section within 72 hours from the incident time)

A. PERSONNEL INFORMATION

Name of Injured:		PR No.:
Group:		Contact No./ Ext. No.:
Incident Site:	Employee Category: () Permanent Employee () Project Employee () Contract () AMC () TPIA () Service Provider/Vendor () Other Category	

B. CATEGORY OF INCIDENT

First aid case	
Medical case	
Asset/Equipment/Property damage	
Vehicle incident	
Fire	
Fatal Accident	

C. INCIDENT INFORMATION

Date / Time of Incident	Date/Time Reported To Group Leader
Person Reporting Incident	
Incident Description:	
Injury / Illness Description:	

D. TREATMENT INFORMATION

Treatment Description		
Treatment Administered By	Date Of Treatment	Time Of Treatment
Phone No of clinic / hospital	Name of Clinic/Hospital:	
Pl. attach medical officer's prescription for medical treatment: -	Released from Hospital Date / Time: -	

E. INITIAL CORRECTIVE ACTION INFORMATION


Immediate Causes of incident:
Initial Corrective actions taken 1. 2. 3.

Prepared By:

Sign:
Name:
Designation:
Date:

Reviewed By:

Sign:
Name:
Designation:
Date:

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY PROTOCOL FOR CONTRACTORS OF ELECTRICAL/MAJOR INSTALLATION OF ELECTRICAL EQUIPMENTS/ MACHINARIES AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

1. PURPOSE

The purpose of this protocol is to establish, implement and execute a safe and effective program for the prevention of incidents that may cause injury to persons or damage to the property. The specified responsibilities remain with the contractor for compliance.

2. SCOPE

- 2.1 This protocol shall be considered minimum requirements necessary for all works performed inside the Institute for Plasma Research (IPR) and associated centres/units/departments.
- 2.2 All the contractor while at IPR and associated centres/units/departments work site are required to ensure that themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors, must comply with the provisions of this protocol.
- 2.3 The contractor shall review and educate their workers and employees about the stipulations of this protocol.
- 2.4 This protocol is in addition to the responsibility of the contractor towards safety, health and environmental compliance envisaged under law, code or statutory requirements.


3. PROTOCOL

- 3.1 The contractor has to provide appropriate Personal Protective Equipments (PPE) like safety shoes, safety helmets, goggles, hand gloves, full body safety harnesses, etc. as required for safety of themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors at site. All PPE must conform to relevant Indian and/or International Standards. These should be maintained in recommended condition by suitable storage, maintenance and inspection. IPR shall have right to examine the PPE and determine their suitability, reliability, acceptability and adaptability.
- 3.2 The contractor shall provide and maintain proper illumination, fencing, guards, stairs, ladders, scaffolding, warning signs, caution boards, etc. as required to ensure safe working conditions at site.
- 3.3 The contractor shall ensure that all floor and wall openings are fixed and properly guarded/barricaded during the course of work and at the end of each day's work with appropriate caution board.
- 3.4 The contractor must adhere to the requirements of Safety, Health and Environment (SHE) Policy of IPR, salient features of which are:
 - f. Continual improvement in its Safety, Health & Environment Performance,
 - g. Conservation of natural resources,
 - h. Waste minimization,
 - i. Compliance with applicable statutory and regulatory requirements,
 - j. Creating safety & environmental awareness to its employees and associates.

- 3.5 The contractor has to ensure to employ only persons who are medically fit and having sufficient skills for execution of work. The contractor must ensure efficient job supervision through educated, qualified, experienced and responsible supervisors to ensure safety at site.
- 3.6 All staff persons including workers must undergo Safety Induction Training prior to depute them at IPR and associated centres/units/departments for any kind of work. Training module may include video film, clippings, photographs etc. related to work execution. In addition to this, Job specific training must be imparted to the concerned workers periodically.
- 3.7 The contractor has to ensure that Daily Tool Box Talk shall be conducted at least for new workers by responsible work in-charge/supervisor for each activity and its record to be maintained.
- 3.8 The contractors themselves, their workers and employees, sub-contractors, if any, shall comply with the instructions given by the Safety Officer or his authorized nominee or IPR's representative regarding safety precautions, protective measures, housekeeping requirements, etc. IPR shall have the right at its sole discretion to stop the work, if the work is being carried out in such a way that it may cause accidents or harm to the workers or damage to the equipments. Contractor shall get the unsafe condition removed and report to IPR.
- 3.9 The contractor shall have no right to claim any damages/compensations for stoppage of work due to safety reasons as provided in para 3.8 .The period of such stoppage of work will not be taken as an extension of time for completion of work or exemption from liquidated damages/compensation delay.
- 3.10 The contractor should ensure that water, fuel and energy are used judiciously. The water & power points must be closed / put off when not in use.
- 3.11 Good housekeeping practices must be followed strictly.
- 3.12 All equipments used for electrical work, installation of electrical equipments/machineries and other related work by the contractor must meet Indian/International standards. In case such standards do not exist, the contractor must ensure these to be absolutely safe. All equipments shall be strictly operated and maintained in accordance with manufacturers' operation manual and safety instructions.
- 3.13 The contractor must not interfere or disturb electric, fuses, cables and other electrical equipments belonging to IPR or another agency under any circumstances whatsoever unless expressly permitted in writing by IPR.
- 3.14 Contractor shall arrange adequate facilities for first aid, medical aid and treatment for his staff and workers engaged at the work site.
- 3.15 The contractor has to fully be responsible for the behaviour and conduct of themselves, their workers and employees and sub-contractors. Any cost of loss or damage to client's property caused by contractor's employees or workers will be recovered from the contractor.
- 3.16 In case of any accident that occurs during the maintenance/ fabrication/erection or associated activities undertaken by the contractor thereby causing any minor or major or fatal injury to themselves, their workers and employees, sub-contractors due to any reason, it shall be the responsibility of the contractor to promptly inform IPR's Work in-charge and Safety Officer in prescribed form of IPR. This should also be informed to statutory authority, if required, under the applicable laws. The contractor shall maintain a register of accidents. In case the contractor fails to

fulfil statutory requirements, IPR shall have the right to withhold contractors payments till the requirement are fulfilled.

- 3.17 The contractor shall plan his activities so as to avoid interference with the assignments of other departments and contractors at the site. In case of any interference, necessary coordination must be sought by the contractor from IPR for safe and smooth working.
- 3.18 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions or as recommended by Safety Officer of IPR must be made by the contractor to extinguish fires.
- 3.19 The contractor shall issue photo identity card for themselves, their workers and employees, sub-contractors to be deployed at site. They are required to be displayed prominently during the period of their stay within IPR and associated centres/units/departments.
- 3.20 The contractor shall obtain gate pass from IPR and associated centres/units/departments for entries and exists of all materials and equipments.
- 3.21 Smoking and eating/chewing of tobacco is strictly prohibited at site.
- 3.22 Any person under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted at work site.
- 3.23 Person below the age of 18 years must not be employed for any work at site
- 3.24 IPR may from time to time, add or amend to these protocols and issue directions.
- 3.25 The contractor shall comply with Safety Instructions as laid down in as per Annexure-I.

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY INSTRUCTIONS FOR CONTRACTORS OF ELECTRICAL/MAJOR INSTALLATION OF ELECTRICAL EQUIPMENTS/ MACHINARIES AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

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1. GENERAL INFORMATION

- 1.1** The purpose of safety instruction document is to establish, implement and execute a practical and effective method for preventing accidents, injuries and property damage.
- 1.2** This document will help contractors and their associates to recognize, evaluate and control hazardous activities within their areas of responsibility.
- 1.3** This document defines the procedure with which safety practice will be administered, identifies responsibilities and ensures control of work area safety.
- 1.4** Contract agreement signed with contractors and the provisions of this document are intended to complement each other to ensure safe working conditions.
- 1.5** The provisions of this document apply to IPR and associated centres/units/departments.
- 1.6** Throughout this document, reference to a contractor means the contractor's company and the associated subcontractors, consultants, vendors and suppliers. Reference to contractor's management means personnel responsible for managing, supervising or directing contract activities and employees.
- 1.7** Non-compliance of this document is treated as non-compliance of contract agreement that may result in warning/penalty. Willful or repeated non-compliance may result in contractor dismissal and contract termination.
- 1.8** This document for contractors is a supplementary document to statutory rules, codes and regulations having jurisdiction, and does not negate, abrogate or minimise any provisions of these rules, codes and regulations. It is intended to supplement and enforce the individual program of the contractor and to coordinate the overall safety effort. Contractors are responsible for the safety and health of their employees, subcontractors, consultants, vendors, suppliers, and visitors while in IPR and associated centres/units/departments.
- 1.9** Contractor's managers and supervisors are responsible for preventing incidents or conditions that could lead to incidents, injuries, illness or fatalities. The ultimate success of the safety program depends on the cooperation of everyone. The contractor's management must ensure that safety provisions are enforced and that effective training and education programs are employed.

2. ROLE OF THE CONTRACTOR

2.1 Top Management of the Contractor

The commitment of top management of the contractor towards safety is very important. Top management needs to ensure the following:

- 2.1.1** To implement safe methods and practices, deploy appropriate machineries, tools & tackles, experienced supervision and skilled workforce, etc. required for execution.
- 2.1.2** To ensure that employees and workers deployed are physically and mentally fit. They should possess requisite skill, qualification, experience etc.
- 2.1.3** To deploy qualified and trained safety supervisor, safety officers and/or safety manager reporting to site In-charge for supervision, co-ordination and liaison for the implementation of safety.
- 2.1.4** To ensure that the employees and workers have appropriate health and safety training. The certification of such training should be produced for verification, on demand.
- 2.1.5** To obtain all necessary and applicable licences, permits, and insurance policy of his employees and workers before executing any work. A copy of the same must be submitted to the relevant authority at IPR.

- 2.1.6 To ensure that all incidents (minor/major injuries, fatality, fire, property damage etc.) including near misses shall be reported to the relevant authority at IPR immediately verbally as well as in written format of IPR. Also, keep record for the same.
- 2.1.7 The liability for any compensation on account of injury sustained by an employee of the contractor will be exclusively that of the contractor.
- 2.1.8 To provide personal protective equipments required for the safety and first-aid kits at worksite.
- 2.1.9 To maintain appropriate records of all employees and workers deployed to carry out the work at site.
- 2.1.10 Contractor shall not employ any labour below 18 years of age.
- 2.1.11 A photo gate pass duly approved by IPR administration shall be issued by the contractor to their personnel, employees, subcontractors, etc.
- 2.1.12 To co-operate with all the security arrangements of IPR.
- 2.1.13 Contractor may ask for clarifications required in safety related issues, whenever a need arises.
- 2.1.14 To follow and implement all the safety rules and regulations of the local bodies, state, national and international. Contractor shall also comply with all the statutory requirements and notifications, as applicable, in relation to employment of his employees issued time to time by the concerned authorities.

2.2 Contractor Safety Officer, Safety Supervisor and/or Job Supervisor

The duties and responsibilities of the contractor safety officer, safety supervisor and/or job supervisor shall include the following:

- 2.2.1 To assess the hazards associated with work at site in consultation with all concerned and establish safe working procedure.
- 2.2.2 To establish a written records of factors that can cause injuries, illness or other safety related problems.
- 2.2.3 To undertake routine/surprise inspections of all work sites to ensure compliance with safety standards, codes, rules, regulations and orders applicable to the work concerned.
- 2.2.4 To check whether the proposed working arrangements/procedures are safe and satisfactory, particularly at the interface between contractors planned work and IPR facilities.
- 2.2.5 To ensure that required guards and protective equipment are provided, used and properly maintained.
- 2.2.6 To ensure that the workers understand the working procedures for carrying out the work safety and the hazards that may be encountered.
- 2.2.7 To take immediate actions to correct any violation of safety rules observed or reported.
- 2.2.8 To ensure that appropriate warning signboards and tags are displayed.
- 2.2.9 To report each incident and/or injury in accordance with established procedures and assists during investigation.
- 2.2.10 To arrange tool box meeting daily and shall continue this process to make workmen safety conscious. To keep a constant liaison with the relevant authority at IPR on safety issues.

2.3 Contractor Employees

The duties & responsibilities of the contractor employees should include the following:

- 2.3.1 The contractors' employees must be trained for safety standards, procedure to carry out high risk job (if involved), use of Personal Protective Equipments (PPEs) in general and specific for a particular job, emergency preparedness and fire extinguisher and medical first-aid.
- 2.3.2 To perform work safely as per the job requirements/instructions and wear appropriate PPEs.

- 2.3.3 To inform promptly to their management regarding all work related incidents resulting in personal injury, illness and/or property damage, etc.
- 2.3.4 To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

3. PENALTY FOR NON-COMPLIANCE

The following penalties shall be imposed on the contractor by the IPR and shall be deducted from his running/final bill.

Sr. No.	Non-Compliance/Violation of Safety Protocols/Rules/Norms	Penalty
1.	Non-use of PPE like Safety Helmet / Safety Shoes etc.	Rs. 100 per day/person
2.	Over speeding (> 30Km/Hr) / rash driving or improper parking	Rs. 100 per occasion
3.	Non-use ELCB/MCB, Use of non-standard socket, poor cable joint, laying wire/cables on floor, non-use of socket, electrical jobs by incompetent person	Rs. 200 per day/case
4.	Working at height without full body safety harness, using non-standard scaffolding and not arranging fall protection arrangement	Rs. 500 per day/case
5.	Handling of compressed gas cylinders without trolley and double gauge regulator, Improper keeping/storage of gas cylinder	Rs. 200 per day/case
6.	Use of domestic LPG for cutting purpose.	Rs. 200 per day/case
7.	No fencing/barricading of excavated/open areas.	Rs. 200 per day/case
8.	No provision of firefighting equipment during hot works. Use of firewater for purpose other than firefighting.	Rs. 200 per day/case
9.	No reporting of Nearmiss/First-aid/Injury/Property damage/Minor fire etc. incidents	Rs. 500 per case
10.	Poor Housekeeping	Rs. 200 per day/case
11.	No deployment of safety officer/safety supervisor responsible for safety at work site as mentioned in Chapter No. 5	Rs. 500 per day

Safety Officer or any other officer authorized by IPR will report safety violation to the concerned Engineer In-charge for imposing necessary penalty. Engineer-in-charge shall ensure that the penalty amount has been deducted from the running bill of contractor. Imposing any penalty for violation of safety norms does not absolve the contractors from their contractual obligation/ responsibility. Contractor shall be fully responsible for any accident and/or injury to their employees or property due to violation of safety norms.

4. PROVISION FOR SAFETY SUPERVISOR /SAFETY OFFICER OF CONTRACTOR

The contractor shall depute at least one Safety Supervisor / Safety Officer for critical activities as follows,

- vi. Work at height (working beyond 2.5 mtr. above ground)
- vii. Materials and Material Handling which includes movement of heavy material by crane, movement of tractor trolley on slopes, Manual lifting of heavy material to height, erection of heavy machinery, equipment, etc.
- viii. Loading and unloading of equipment, structural materials, machineries, etc., Fabrication and

erection work

- ix. Working near high voltage lines, electrical installations, etc., charging of electrical system, transformers, switch yard, switch gears, etc.
- x. Work related to welding, gas cutting, grinding, etc.

In addition to above list, IPR may also recommend for some specific tasks, which are not covered, to depute Safety Officer/Safety Supervisor.

Safety supervisor shall be qualified of minimum Diploma in Engineering/ Graduate in Science with approved course in the field of safety and/or fire. He shall able to read and understand English and speak regional/national language. He shall have experience as safety supervisor for a period of minimum one year.

Safety Officer shall be qualified of minimum Bachelor in Engineering/ Post Graduate in Science with approved course in the field of Safety and/or Fire. Safety Officer shall have good communication and written skill to liaison with the client. He shall have good command in English and regional/national language. He shall have experience for a period of minimum three years of supervisory level.

5. GENERAL SAFETY PROVISIONS

5.1 Personal Protective Equipment

The contractor is responsible to provide all necessary standard make (ISI marked) personal protective equipment (PPE) suitable to give sufficient protection against hazards involved in their work / job to their employees, as per the job requirement and insist/enforce their staff to put on the same while at works and ensure that the PPEs are properly used and maintained in a condition suitable for immediate use. The contractor shall have sufficient stock of various PPEs to avoid any shortage of supply and shall take adequate steps to ensure proper use of equipment by those concerned. The ongoing work is liable to be stopped at any time if the contractor's staff is found working without PPEs.

- 5.1.1 All persons employed at site shall use safety helmets. For other types of works, persons working in that area shall also use safety helmets, if advised by Safety Engineer/Engineer-In-Charge.
- 5.1.2 Persons engaged in welding and gas-cutting works shall use suitable welding face shields. The persons who assist the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- 5.1.3 All persons working at heights more than 2.5 m above ground or floor and exposed to risk of falling down shall use full body safety harness, unless otherwise protected by cages, guard railings, etc. In places where the use of safety harness is impractical, suitable net of adequate strength fastened to substantial supports shall be employed.
- 5.1.4 When workers are employed in sewers and inside manholes, which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. After it has been well ventilated, the atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the register before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with

warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

5.1.5 The following is the list of various PPEs to be used for various works/worksites,

List of Safety Equipments

Sr. No.	PPE	Purpose
01	Industrial Safety Helmet	For protection of head against falling objects or during fall of person from height.
02	Safety Goggles (Grinding, Welding, etc).	For protection of eyes against flying particles / dust, chemical splash, spark, arc, flashover etc.
03	Face shield	For protection of face against flying particles / dust, chemical splash, spark, arc, flashover etc.
04	Ear plug / Ear muffs	For ear / hearing system protection while working in high noise level area.
05	Apron (PVC /cryo/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cryo, Electrical shock proof)	For protection of hands against chemicals, oils, cryogenics, sharp edged objects, heat, hot metals/objects, electricity etc.
07	Safety Shoes	For protection of leg/feet against falling objects, sharp edged objects, heat, hot metals/objects, electricity etc.
08	Full body safety harness/I Rope/Life line/ Fall prevention system etc.	For fall prevention while working at heights or in depth, working in vessel or in confined space.
09	Dust Respirator	Protection of respiratory system against dust.
10	Self-contained breathing apparatus (SCBA) set	Working in oxygen deficient areas.

5.2 Electricity

The following are provided for general guidance of the Contractor and shall be read as specific requirement, in addition to complying with Indian Electricity Act, Indian Electricity Rules and IS Specifications.

5.2.1 Only qualified electricians familiar with code requirements are allowed to perform electrical work.

5.2.2 Employees are not permitted to work near an unprotected electrical power circuit unless they are protected against electrical shock by de-energizing the circuit and grounding it, or are protected by effective insulation or other means, and are wearing .required personal protective equipment.

5.2.3 The electric power supply will be generally made available at one point in the works site of the contractor by the IPR.

5.2.4 All three phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.

5.2.5 All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth

connection. Neutral conductor shall not be treated as earth wire.

- 5.2.6 The contractor shall not connect any additional load without prior permission of IPR.
- 5.2.7 Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However tappings from an earth bus may be done.
- 5.2.8 Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- 5.2.9 Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards.
- 5.2.10 Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses be used in all circuits. For load of 5 KW or more earth leakage circuit breaker of proper rating shall be provided in the circuits.
- 5.2.11 Wires and cables shall be properly supported and approved method of fixing shall be adopted. Cables shall not be left on floor/ground. Loose hanging of wires & cables shall be avoided. Lightning and power circuits shall be kept distinct and separate.
- 5.2.12 Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- 5.2.13 All cables and wires shall be adequately protected mechanically against damages. In case, the cable required to be laid underground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC), tile or any other approved means.
- 5.2.14 All armoured cables shall be properly terminated by using suitable cable glands. Multi-stranded conductor cables shall be connected by using cable lugs/ sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- 5.2.15 All the Distribution Boards, Switch Fuse units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and waterproof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible.
- 5.2.16 The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all switch boards, equipment etc. against rain.
- 5.2.17 Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply, when repair or maintenance work has to be done.
- 5.2.18 All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron framework shall be used.
- 5.2.19 Only PVC insulated and PVC sheathed wires or armored PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- 5.2.20 All portable appliances shall be provided with three-core cable and three-pin plug. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.

5.3 House Keeping

- 5.3.1 The Contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment so as not to create unsafe condition or fire hazard.
- 5.3.2 Welding and other electrical cables shall be properly routed.
- 5.3.3 No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
- 5.3.4 Cleaning of the work area at the end of the day and upon completion of work is a part of the job.
- 5.3.5 The Engineer-in-charge has the right to stop work if the Contractor fails to improve upon the housekeeping after having been notified.

5.4 Fire Safety

- 5.4.1 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions shall be made to extinguish fires, if it still breaks out.
- 5.4.2 Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be kept minimum in order to avoid unnecessary accumulation of combustibles at site.
- 5.4.3 Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
- 5.4.4 Fire extinguishers shall be located at the site at appropriate places.
- 5.4.5 Adequate number of workmen shall be given education and training in firefighting and extinguishing methods.

5.5 Scaffolding

Accidents are also caused by the ladders falling or the climber losing his balance or failure of scaffolds. As such, utmost care should be taken as ladder and scaffolding are extensively used for maintenance and construction purpose. Some of the safe practices as listed below are to be observed before commencement of work.

- 5.7.5 Adequate and safe means of access and exit shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevations shall not be permitted.
- 5.7.6 Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal and all ladders shall be maintained well for safe working condition.
- 5.7.7 Short ladder must not be tied together to give greater lengths. All ladders of 6 m or above should be tied to the structure on which they are resting to prevent from. An extra worker shall be engaged for holding the ladder if ladder is not securely fixed. If the ladder is used for carrying materials, suitable foot holds and handholds shall be provided on the ladder. The ladder shall be given an inclination not steeper than 1 in 4(1 horizontal and 4 vertical). Ladders shall not be used for climbing carrying materials in hands. While climbing both the hands shall not be free.

- 5.7.8 The free length must extend by 1.5 meters above the point of landing but should not be more than $1/4^{\text{th}}$ of the ladder length. No portable single ladder shall be over 9 meter in length. Metal ladders may not be used for electrical work.
- 5.7.9 Scaffolding or staging more than 3.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a standard guard rail properly attached, bolted, braced or otherwise secured at least 1.0 m high above the floor or platform of such scaffolding or staging. The guard rail shall extend along the entire exposed length of the scaffolding with only such opening as may be necessary for the delivery of materials. Standard railing shall have posts not more than 2 m apart and an intermediate rail halfway between the floor or platform of the scaffolding and the top rail. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure. Scaffolding and ladder shall conform to relevant IS specification (IS: 3696). Timber/Bamboo scaffolding shall not be used.
- 5.7.10 Working platforms of scaffolds shall have toe boards at least 15 cm in height to prevent materials from falling down.
- 5.7.11 Every part of scaffolding must be of sound construction. Steel planks used in scaffolds should be carefully inspected and should be tied on both sides with suitable fixing arrangements to the pipes. Scaffolding must not be overloaded.
- 5.7.12 The Steel pipe & clamp to be used must be of good quality. The spacing between the vertical & horizontal members of the scaffolding should not be more than 1.5m and 1 meter respectively. The scaffolding should be further strengthened with cross bracing and stays.
- 5.7.13 The scaffolds should be provided with short climbs ladders for safe ascending/ descending of workmen in the job. Only those workmen who are well trained/ experienced in erecting scaffolding should be engaged for scaffolding work. The men working in the actual erection/dismantling of the scaffolding and all persons using the scaffolding must use appropriate PPEs.
- 5.7.14 A sketch of the scaffolding proposed to be used shall be prepared and approved by the Engineer-in charge, prior to start of erection of scaffolding. All scaffolds shall be examined by Engineer-In-Charge before use.
- 5.7.15 Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally and if the height of the platform or gangway or stairway is more than 3.5 m above ground level or floor level, they shall be closely boarded, shall have adequate width for easy movement of persons and materials and shall be suitably guarded.
- 5.7.16 The planks used for working platform shall not project beyond the end supports to a distance exceeding four times the thickness of the planks used. The planks shall be rigidly tied at both ends to prevent sliding and slippage. The thickness of the planks shall be adequate to take load of men and materials and shall not collapse.
- 5.7.17 Each opening in the floor of a building or at a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing.
- 5.7.18 Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9 m in length. For ladders up to 3m in length the width between side rails in the ladder shall in no case be less than 300 mm. For longer ladders this width shall be increased by at least 20 mm for each additional meter of length. Step spacing shall be uniform and shall not exceed 300 mm.
- 5.7.19 Adequate precautions shall be taken to prevent danger from electrical lines and equipment. No scaffolding, ladder, working platform, gangway runs, etc. shall exist within 3 meters of any uninsulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipments are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

5.6 Lifting/Hoisting Equipment and Erection

Accidents do happen while working overhead or due to failure or unsafe use of hoisting equipment. As such, adequate care must be taken to prevent it. The following are some of the precautions to ensure safety of the workmen engaged by the contractor:

- 5.6.1 Contractors involved in handling of any material overhead must install necessary barricades, warning signs or take any other steps necessary to prevent others from walking/standing beneath the load.
- 5.6.2 Hoisting machines, tackles including their attachments, anchorage and supports must conform to the good mechanical construction, sound materials and adequate strength and free from patent defect and shall be preserved in good condition.
- 5.6.3 All equipments like crane, chain blocks, sling, rope including all other material handling equipments must have valid load test certificates.
- 5.6.4 Thorough inspection and load testing of lifting machines and tackles shall be done by a competent person at least once every 12 months and records of such inspection and testing shall be maintained.
- 5.6.5 Every crane driver or hoisting appliances operator shall be properly qualified and no person below the age 21 years should be in charge of any hoisting machine.
- 5.6.6 Every hoisting machine and all gears shall be plainly marked with the safe working load. No part of any machine or gear shall be loaded beyond the safe working load (SWL).
- 5.6.7 In case of IPR's machines, the safe working load shall be notified by Engineer-in-charge. For contractor's machines, the contractor shall notify the safe working load to Engineer-in-charge.
- 5.6.8 Motors, gearing transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with safe guards.
- 5.6.9 No cranes shall be left unattended with hanging load and on completion of work, the boom/jib of the crane may be brought down and kept in horizontal condition.
- 5.6.10 No crane including hydra crane shall be allowed to move on road with suspended load.

5.7 Welding and Gas Cutting

- 5.7.1 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.
- 5.7.2 Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.
- 5.7.3 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.
- 5.7.4 Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on persons or flammable materials. Adequate ventilation shall be provided while welding in confined space.
- 5.7.5 Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter glasses of appropriate shade shall be worn as face protection.
- 5.7.6 Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied, cleaned thoroughly and it is made certain that no flammable material is present.
- 5.7.7 Fire extinguisher shall be available near the location of welding operations. Prior permission shall be obtained from safety section for working at vulnerable areas and operating areas before flame cutting/welding is taken up.
- 5.7.8 Tarpaulin, if used should be of fire retardant.
- 5.7.9 For electric (Arc) welding the following additional safety precautions shall be taken:

- When electrical welding is undertaken near pipe lines carrying flammables, such pipe lines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.
 - Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.
 - Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
- 5.7.10 The cylinders containing poisonous/toxic or inflammable / explosive gas like Oxygen, Acetylene, Hydrogen, Ammonia, Chlorine, CO₂ etc. shall be handled safely taking due cares. To handle / shift such cylinders a special trolley / cage meant for it must be used but in no case it should be rolled.
- 5.7.11 No domestic LPG cylinder is allowed for Hot Work such as Gas Welding / Gas Cutting.
- 5.7.12 A person must remain in the area for a minimum period of 30 minutes after hot work is completed to ensure the site is safe. Welding machine shall be switched off after the completion of work.

5.8 Grinding

- 5.8.1 All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- 5.8.2 Grinding wheels of specified diameter only shall be used on a grinder- portable or pedestal - in order not to exceed the prescribed peripheral speed.
- 5.8.3 Goggles shall be used during grinding operation.

5.9 Electrical Equipment – Installation and/or Maintenance

- 5.1.5 Consider all the equipment as live before touching until they are proved to be dead.
- 5.1.6 Before attempting maintenance on electrical equipment, ensure electrical isolation & earthing. Follow “permit to work on electrical system” procedures.
- 5.1.7 Be sure about isolation by physical verification. Check isolation tags on feeders/breakers.
- 5.1.8 Keep electrical insulating mat/paint in front of electrical panel/ switches.
- 5.1.9 Inspect the equipment thoroughly before normalization.
- 5.1.10 Follow SIDE rule before starting maintenance work on electrical equipment. (S=Switch off, I=Isolate, D=Discharge, E=Earthing).
- 5.1.11 Have minimum number of cable joints and insulate properly all the cable joints.
- 5.1.12 If water cooling is used, ensure that water connections are fitted correctly with no chance of leakage onto HV system.
- 5.1.13 Supply of energy to every electrical installation, other than low voltage installation below 5 kW, shall be controlled by an earth leakage protective device so as to disconnect the supply instantly on the occurrence of earth fault or leakage current.
- 5.1.14 Don't work alone in and around high voltage system.
- 5.1.15 Lifting of electrical equipment as per manufacturer's instructions.
- 5.1.16 Do not allow visitors to enter into high voltage zones without escorting by an authorized person.
- 5.1.17 Never depend on verbal communication for isolation of electrical equipment.
- 5.1.18 Do not wear metallic ornament while working on electrical equipment.
- 5.1.19 Do not overload the power cable beyond its current carrying capacity.
- 5.1.20 Do not insert bare wires of appliances in the plug socket.
- 5.1.21 Only trained, experience and authorized personnel should carrying out maintenance, repair, adjustment etc.
- 5.1.22 Identified tools should be used to carry out such works.
- 5.1.23 Eli Chips and debris must be swept up and properly disposed.

6. REPORTING FORM

6.1 Near Miss Reporting Form

(This form may be filled and submitted to the Safety Section within 48 hours from the incident time)

1. Name of Person Affected/Observed Near miss:	2. Group/Division/Section:
3. Designation:	4. Location of Near Miss:
5. Date & Time of Near Miss:	6. Contact no:/Ext. No.:
7. Near Miss Description: <i>(Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)</i> ----- ----- ----- ----- ----- ----- -----	
8. Possible Damage that might have happened: (i) (ii)	
9. Corrective Actions Proposed to prevent reoccurrence of such near miss incident(s): 	

Submitted By:

Signature:

Name:

Date:

6.2 Incident Reporting Form

(This form is to be filled and submitted for all incidents except near miss to safety section within 72 hours from the incident time)

B. PERSONNEL INFORMATION

Name of Injured:		PR No.:
Group:		Contact No./ Ext. No.:
Incident Site:	Employee Category: () Permanent Employee () Project Employee () Contract () AMC () TPIA () Service Provider/Vendor () Other Category	

B. CATEGORY OF INCIDENT

First aid case	
Medical case	
Asset/Equipment/Property damage	
Vehicle incident	
Fire	
Fatal Accident	

C. INCIDENT INFORMATION

Date / Time of Incident	Date/Time Reported To Group Leader
Person Reporting Incident	
Incident Description:	
Injury / Illness Description:	

F. TREATMENT INFORMATION

Treatment Description		
Treatment Administered By	Date Of Treatment	Time Of Treatment
Phone No of clinic / hospital	Name of Clinic/Hospital:	
Pl. attach medical officer's prescription for medical treatment: -	Released from Hospital Date / Time: -	

G. INITIAL CORRECTIVE ACTION INFORMATION


Immediate Causes of incident:
Initial Corrective actions taken 1. 2. 3.

Prepared By:

Sign:
Name:
Designation:
Date:

Reviewed By:

Sign:
Name:
Designation:
Date:

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY PROTOCOL FOR CONTRACTORS OF MECHANICAL/ MAINTENANCE/ FABRICATION/ERECTION AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

1. PURPOSE

The purpose of this protocol is to establish, implement and execute a safe and effective program for the prevention of incidents that may cause injury to persons or damage to the property. The specified responsibilities remain with the contractor for compliance.

2. SCOPE

- 2.1 This protocol shall be considered minimum requirements necessary for all works performed inside the Institute for Plasma Research (IPR) and associated centres/units/departments.
- 2.2 All the contractor while at IPR and associated centres/units/departments work site are required to ensure that themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors, must comply with the provisions of this protocol.
- 2.3 The contractor shall review and educate their workers and employees about the stipulations of this protocol.
- 2.4 This protocol is in addition to the responsibility of the contractor towards safety, health and environmental compliance envisaged under law, code or statutory requirements.


3. PROTOCOL

- 3.1 The contractor has to provide appropriate Personal Protective Equipments (PPE) like safety shoes, safety helmets, goggles, hand gloves, full body safety harnesses, etc. as required for safety of themselves, their workers and employees, sub-contractors, suppliers, vendors and visitors at site. All PPE must conform to relevant Indian and/or International Standards. These should be maintained in recommended condition by suitable storage, maintenance and inspection. IPR shall have right to examine the PPE and determine their suitability, reliability, acceptability and adaptability.
- 3.2 The contractor shall provide and maintain proper illumination, fencing, guards, stairs, ladders, scaffolding, warning signs, caution boards, etc. as required to ensure safe working conditions at site.
- 3.3 The contractor shall ensure that all floor and wall openings are fixed and properly guarded/barricaded during the course of work and at the end of each day's work with appropriate caution board.
- 3.4 The contractor must adhere to the requirements of Safety, Health and Environment (SHE) Policy of IPR, salient features of which are:
 - k. Continual improvement in its Safety, Health & Environment Performance,
 - l. Conservation of natural resources,
 - m. Waste minimization,
 - n. Compliance with applicable statutory and regulatory requirements,
 - o. Creating safety & environmental awareness to its employees and associates.

- 3.5 The contractor has to ensure to employ only persons who are medically fit and having sufficient skills for execution of work. The contractor must ensure efficient job supervision through educated, qualified, experienced and responsible supervisors to ensure safety at site.
- 3.6 All staff persons including workers must undergo Safety Induction Training prior to depute them at IPR and associated centres/units/departments for any kind of work. Training module may include video film, clippings, photographs etc. related to work execution. In addition to this, Job specific training must be imparted to the concerned workers periodically.
- 3.7 The contractor has to ensure that Daily Tool Box Talk shall be conducted at least for new workers by responsible work in-charge/supervisor for each activity and its record to be maintained.
- 3.8 The contractors themselves, their workers and employees, sub-contractors, if any, shall comply with the instructions given by the Safety Officer or his authorized nominee or IPR's representative regarding safety precautions, protective measures, housekeeping requirements, etc. IPR shall have the right at its sole discretion to stop the work, if the work is being carried out in such a way that it may cause accidents or harm to the workers or damage to the equipments. Contractor shall get the unsafe condition removed and report to IPR.
- 3.9 The contractor shall have no right to claim any damages/compensations for stoppage of work due to safety reasons as provided in para 3.8 .The period of such stoppage of work will not be taken as an extension of time for completion of work or exemption from liquidated damages/compensation delay.
- 3.10 The contractor should ensure that water, fuel and energy are used judiciously. The water & power points must be closed / put off when not in use.
- 3.11 Good housekeeping practices must be followed strictly.
- 3.12 All equipments used for maintenance, fabrication and assembly work, etc. by the contractor must meet Indian/International standards. In case such standards do not exist, the contractor must ensure these to be absolutely safe. All equipments shall be strictly operated and maintained in accordance with manufacturers' operation manual and safety instructions.
- 3.13 The contractor must not interfere or disturb electric, fuses, cables and other electrical equipments belonging to IPR or another agency under any circumstances whatsoever unless expressly permitted in writing by IPR.
- 3.14 Contractor shall arrange adequate facilities for first aid, medical aid and treatment for his staff and workers engaged at the work site.
- 3.15 The contractor has to fully be responsible for the behaviour and conduct of themselves, their workers and employees and sub-contractors. Any cost of loss or damage to client's property caused by contractor's employees or workers will be recovered from the contractor.
- 3.16 In case of any accident that occurs during the maintenance/ fabrication/erection or associated activities undertaken by the contractor thereby causing any minor or major or fatal injury to themselves, their workers and employees, sub-contractors due to any reason, it shall be the responsibility of the contractor to promptly inform IPR's Work in-charge and Safety Officer in prescribed form of IPR. This should also be informed to statutory authority, if required, under the applicable laws. The contractor shall maintain a register of accidents.
- 3.17 In case the contractor fails to fulfil statutory requirements, IPR shall have the right to withhold contractors payments till the requirement are fulfilled.
- 3.18 The contractor shall plan his activities so as to avoid interference with the assignments of other departments and contractors at the site. In case of any interference, necessary coordination must be sought by the contractor from IPR for safe and smooth working.
- 3.19 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions or as recommended by Safety Officer of IPR must be made by the contractor to extinguish fires.
- 3.20 The contractor shall follow the stipulated procedure regarding work in the radiation area and other works related with radiography. The contractor shall be fully responsible for the safe storage and

handling of his and his sub-contractor's radio-active sources in accordance with AERB rules and other applicable provisions.

- 3.21 The contractor shall issue photo identity card for themselves, their workers and employees, sub-contractors to be deployed at site. They are required to be displayed prominently during the period of their stay within IPR and associated centres/units/departments.
- 3.22 The contractor shall obtain gate pass from IPR and associated centres/units/departments for entries and exists of all materials and equipments.
- 3.23 Smoking and eating/chewing of tobacco is strictly prohibited at site.
- 3.24 Any person under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted at work site.
- 3.25 Person below the age of 18 years must not be employed for any work at site
- 3.26 IPR may from time to time, add or amend to these protocols and issue directions.
- 3.27 The contractor shall comply with safety instructions as laid down in as per Annexure-I.

	INSTITUTE FOR PLASMA RESEARCH	Revision: 00
	SAFETY INSTRUCTIONS FOR CONTRACTORS OF MECHANICAL/MAINTENANCE/FABRICATION/ ERECTION AND OTHER RELATED ACTIVITIES	Eff. Date: 20.03.2014

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1. GENERAL INFORMATION

- 1.1** The purpose of safety instruction document is to establish, implement and execute a practical and effective method for preventing accidents, injuries and property damage.
- 1.2** This document will help contractors and their associates to recognize, evaluate and control hazardous activities within their areas of responsibility.
- 1.3** This document defines the procedure with which safety practice will be administered, identifies responsibilities and ensures control of work area safety.
- 1.4** Contract agreement signed with contractors and the provisions of this document are intended to complement each other to ensure safe working conditions.
- 1.5** The provisions of this document apply to IPR and associated centres/units/departments.
- 1.6** Throughout this document, reference to a contractor means the contractor's company and the associated subcontractors, consultants, vendors and suppliers. Reference to contractor's management means personnel responsible for managing, supervising or directing contract activities and employees.
- 1.7** Non-compliance of this document is treated as non-compliance of contract agreement that may result in warning/penalty. Willful or repeated non-compliance may result in contractor dismissal and contract termination.
- 1.8** This document for contractors is a supplementary document to statutory rules, codes and regulations having jurisdiction, and does not negate, abrogate or minimise any provisions of these rules, codes and regulations. It is intended to supplement and enforce the individual program of the contractor and to coordinate the overall safety effort. Contractors are responsible for the safety and health of their employees, subcontractors, consultants, vendors, suppliers, and visitors while in IPR and associated centres/units/departments.
- 1.9** Contractor's managers and supervisors are responsible for preventing incidents or conditions that could lead to incidents, injuries, illness or fatalities. The ultimate success of the safety program depends on the cooperation of everyone. The contractor's management must ensure that safety provisions are enforced and that effective training and education programs are employed.

2. ROLE OF THE CONTRACTOR

2.1 Top Management of the Contractor

The commitment of top management of the contractor towards safety is very important. Top management needs to ensure the following:

- 2.1.1** To implement safe methods and practices, deploy appropriate machineries, tools & tackles, experienced supervision and skilled workforce, etc. required for execution.
- 2.1.2** To ensure that employees and workers deployed are physically and mentally fit. They should possess requisite skill, qualification, experience etc.
- 2.1.3** To deploy qualified and trained safety supervisor, safety officers and/or safety manager reporting to site In-charge for supervision, co-ordination and liaison for the implementation of safety.
- 2.1.4** To ensure that the employees and workers have appropriate health and safety training. The certification of such training should be produced for verification, on demand.
- 2.1.5** To obtain all necessary and applicable licences, permits, and insurance policy of his employees and workers before executing any work. A copy of the same must be submitted to the relevant authority at IPR.
- 2.1.6** To ensure that all incidents (minor/major injuries, fatality, fire, property damage etc.) including near misses shall be reported to the relevant authority at IPR immediately verbally as well as in written format of IPR. Also, keep record for the same.

- 2.1.7 The liability for any compensation on account of injury sustained by an employee of the contractor will be exclusively that of the contractor.
- 2.1.8 To provide personal protective equipments required for the safety and first-aid kits at worksite.
- 2.1.9 To maintain appropriate records of all employees and workers deployed to carry out the work at site.
- 2.1.10 Contractor shall not employ any labour below 18 years of age.
- 2.1.11 A photo gate pass duly approved by IPR administration shall be issued by the contractor to their personnel, employees, subcontractors, etc.
- 2.1.12 To co-operate with all the security arrangements of IPR.
- 2.1.13 Contractor may ask for clarifications required in safety related issues, whenever a need arises.
- 2.1.14 To follow and implement all the safety rules and regulations of the local bodies, state, national and international. Contractor shall also comply with all the statutory requirements and notifications, as applicable, in relation to employment of his employees issued time to time by the concerned authorities.

2.2 Contractor Safety Officer, Safety Supervisor and/or Job Supervisor

The duties and responsibilities of the contractor safety officer, safety supervisor and/or job supervisor shall include the following:

- 2.2.1 To assess the hazards associated with work at site in consultation with all concerned and establish safe working procedure.
- 2.2.2 To establish a written records of factors that can cause injuries, illness or other safety related problems.
- 2.2.3 To undertake routine/surprise inspections of all work sites to ensure compliance with safety standards, codes, rules, regulations and orders applicable to the work concerned.
- 2.2.4 To check whether the proposed working arrangements/procedures are safe and satisfactory, particularly at the interface between contractors planned work and IPR facilities.
- 2.2.5 To ensure that required guards and protective equipment are provided, used and properly maintained.
- 2.2.6 To ensure that the workers understand the working procedures for carrying out the work safety and the hazards that may be encountered.
- 2.2.7 To take immediate actions to correct any violation of safety rules observed or reported.
- 2.2.8 To ensure that appropriate warning signboards and tags are displayed.
- 2.2.9 To report each incident and/or injury in accordance with established procedures and assists during investigation.
- 2.2.10 To arrange tool box meeting daily and shall continue this process to make workmen safety conscious. To keep a constant liaison with the relevant authority at IPR on safety issues.

2.3 Contractor Employees

The duties & responsibilities of the contractor employees should include the following:

- 2.3.1 The contractors' employees must be trained for safety standards, procedure to carry out high risk job (if involved), use of Personal Protective Equipments (PPEs) in general and specific for a particular job, emergency preparedness and fire extinguisher and medical first-aid.
- 2.3.2 To perform work safely as per the job requirements/instructions and wear appropriate PPEs.
- 2.3.3 To inform promptly to their management regarding all work related incidents resulting in personal injury, illness and/or property damage, etc.

2.3.4 To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

3. PENALTY FOR NON-COMPLIANCE

The following penalties shall be imposed on the contractor by the IPR and shall be deducted from his running/final bill.

Sr. No.	Non-Compliance/Violation of Safety Protocols/Rules/Norms	Penalty
1.	Non-use of PPE like Safety Helmet / Safety Shoes etc.	Rs. 100 per day/person
2.	Over speeding (> 30Km/Hr) / rash driving or improper parking	Rs. 100 per occasion
3.	Non-use ELCB/MCB, Use of non-standard socket, poor cable joint, laying wire/cables on floor, non-use of socket, electrical jobs by incompetent person	Rs. 200 per day/case
4.	Working at height without full body safety harness, using non-standard scaffolding and not arranging fall protection arrangement	Rs. 500 per day/case
5.	Handling of compressed gas cylinders without trolley and double gauge regulator, Improper keeping/storage of gas cylinder	Rs. 200 per day/case
6.	Use of domestic LPG for cutting purpose.	Rs. 200 per day/case
7.	No fencing/barricading of excavated/open areas.	Rs. 200 per day/case
8.	No provision of firefighting equipment during hot works. Use of firewater for purpose other than firefighting.	Rs. 200 per day/case
9.	No reporting of Nearmiss/First-aid/Injury/Property damage/Minor fire etc. incidents	Rs. 500 per case
10.	Poor Housekeeping	Rs. 200 per day/case
11.	No deployment of safety officer/safety supervisor responsible for safety at work site as mentioned in Chapter No. 5	Rs. 500 per day

Safety Officer or any other officer authorized by IPR will report safety violation to the concerned Engineer In-charge for imposing necessary penalty. Engineer-in-charge shall ensure that the penalty amount has been deducted from the running bill of contractor. Imposing any penalty for violation of safety norms does not absolve the contractors from their contractual obligation/ responsibility. Contractor shall be fully responsible for any accident and/or injury to their employees or property due to violation of safety norms.

4. PROVISION FOR SAFETY SUPERVISOR /SAFETY OFFICER OF CONTRACTOR

The contractor shall depute at least one Safety Supervisor / Safety Officer for critical activities as follows,

- xi. Work at height (working beyond 2.5 mtr. above ground)
- xii. Materials and Material Handling which includes movement of heavy material by crane, movement of tractor trolley on slopes, Manual lifting of heavy material to height, erection of heavy machinery, equipment, etc.
- xiii. Loading and unloading of equipment, structural materials, machineries, etc., Fabrication and erection work
- xiv. Working near high voltage lines, electrical installations, etc., charging of electrical system,

transformers, switch yard, switch gears, etc.

- xv. Work on pressure vessels/lines
- xvi. Work in confined space
- xvii. Radiography work
- xviii. Work related to welding, gas cutting, grinding, etc.
- xix. Work with pneumatic tools/compressed air
- xx. Leak detection testing / Hydraulic testing

In addition to above list, IPR may also recommend for some specific tasks, which are not covered, to depute Safety Officer/Safety Supervisor.

Safety supervisor shall be qualified of minimum Diploma in Engineering/ Graduate in Science with approved course in the field of safety and/or fire. He shall able to read and understand English and speak regional/national language. He shall have experience as safety supervisor for a period of minimum one year.

Safety Officer shall be qualified of minimum Bachelor in Engineering/ Post Graduate in Science with approved course in the field of Safety and/or Fire. Safety Officer shall have good communication and written skill to liaison with the client. He shall have good command in English and regional/national language. He shall have experience for a period of minimum three years of supervisory level.

5. GENERAL SAFETY PROVISIONS

5.1 Personal Protective Equipment

The contractor is responsible to provide all necessary standard make (ISI marked) personal protective equipment (PPE) suitable to give sufficient protection against hazards involved in their work / job to their employees, as per the job requirement and insist/enforce their staff to put on the same while at works and ensure that the PPEs are properly used and maintained in a condition suitable for immediate use. The contractor shall have sufficient stock of various PPEs to avoid any shortage of supply and shall take adequate steps to ensure proper use of equipment by those concerned. The ongoing work is liable to be stopped at any time if the contractor's staff is found working without PPEs.

- 5.1.1 All persons employed at site shall use safety helmets. For other types of works, persons working in that area shall also use safety helmets, if advised by Safety Engineer/Engineer-In-Charge.
- 5.1.2 Persons engaged in welding and gas-cutting works shall use suitable welding face shields. The persons who assist the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- 5.1.3 All persons working at heights more than 2.5 m above ground or floor and exposed to risk of falling down shall use full body safety harness, unless otherwise protected by cages, guard railings, etc. In places where the use of safety harness is impractical, suitable net of adequate strength fastened to substantial supports shall be employed.
- 5.1.4 When workers are employed in sewers and inside manholes, which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. After it has been well ventilated, the atmosphere inside the space shall be checked for the presence of any toxic

gas or oxygen deficiency and recorded in the register before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

5.1.5 The following is the list of various PPEs to be used for various works/worksites,

List of Safety Equipments

Sr. No.	PPE	Purpose
01	Industrial Safety Helmet	For protection of head against falling objects or during fall of person from height.
02	Safety Goggles (Grinding, Welding, etc).	For protection of eyes against flying particles / dust, chemical splash, spark, arc, flashover etc.
03	Face shield	For protection of face against flying particles / dust, chemical splash, spark, arc, flashover etc.
04	Ear plug / Ear muffs	For ear / hearing system protection while working in high noise level area.
05	Apron (PVC /cryo/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cryo, Electrical shock proof)	For protection of hands against chemicals, oils, cryogenics, sharp edged objects, heat, hot metals/objects, electricity etc.
07	Safety Shoes	For protection of leg/feet against falling objects, sharp edged objects, heat, hot metals/objects, electricity etc.
08	Full body safety harness/ I Rope /Life line/ Fall prevention system etc.	For fall prevention while working at heights or in depth, working in vessel or in confined space.
09	Dust Respirator	Protection of respiratory system against dust.
10	Self-contained breathing apparatus (SCBA) set	Working in oxygen deficient areas.

5.2 Electricity

The following are provided for general guidance of the Contractor and shall be read as specific requirement, in addition to complying with Indian Electricity Act, Indian Electricity Rules and IS Specifications.

- 5.2.1 Only qualified electricians familiar with code requirements are allowed to perform electrical work.
- 5.2.2 Employees are not permitted to work near an unprotected electrical power circuit unless they are protected against electrical shock by de-energizing the circuit and grounding it, or are protected by effective insulation or other means, and are wearing required personal protective equipment.
- 5.2.3 The electric power supply will be generally made available at one point in the works site of the contractor by the IPR.
- 5.2.4 All three phase equipment shall be provided with double earthing. All light fixtures and

portable equipment shall be effectively earthed to main earthing.

- 5.2.5 All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.
- 5.2.6 The contractor shall not connect any additional load without prior permission of IPR.
- 5.2.7 Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However tappings from an earth bus may be done.
- 5.2.8 Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- 5.2.9 Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards.
- 5.2.10 Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses be used in all circuits. For load of 5 KW or more earth leakage circuit breaker of proper rating shall be provided in the circuits.
- 5.2.11 Wires and cables shall be properly supported and approved method of fixing shall be adopted. Cables shall not be left on floor/ground. Loose hanging of wires & cables shall be avoided. Lightning and power circuits shall be kept distinct and separate.
- 5.2.12 Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- 5.2.13 All cables and wires shall be adequately protected mechanically against damages. In case, the cable required to be laid underground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC), tile or any other approved means.
- 5.2.14 All armoured cables shall be properly terminated by using suitable cable glands. Multi-stranded conductor cables shall be connected by using cable lugs/ sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- 5.2.15 All the Distribution Boards, Switch Fuse units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and waterproof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible.
- 5.2.16 The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all switch boards, equipment etc. against rain.
- 5.2.17 Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply, when repair or maintenance work has to be done.
- 5.2.18 All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron framework shall be used.
- 5.2.19 Only PVC insulated and PVC sheathed wires or armored PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- 5.2.20 All portable appliances shall be provided with three-core cable and three-pin plug. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.

5.3 House Keeping

- 5.3.1 The Contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment so as not to create unsafe condition or fire hazard.
- 5.3.2 Welding and other electrical cables shall be properly routed.
- 5.3.3 No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
- 5.3.4 Cleaning of the work area at the end of the day and upon completion of work is a part of the job.
- 5.3.5 The Engineer-in-charge has the right to stop work if the Contractor fails to improve upon the housekeeping after having been notified.

5.4 Fire Safety

- 5.4.1 All necessary precautions shall be taken to prevent outbreak of fires at the site. Adequate provisions shall be made to extinguish fires, if it still breaks out.
- 5.4.2 Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be kept minimum in order to avoid unnecessary accumulation of combustibles at site.
- 5.4.3 Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
- 5.4.4 Fire extinguishers shall be located at the site at appropriate places.
- 5.4.5 Adequate number of workmen shall be given education and training in firefighting and extinguishing methods.

5.5 Scaffolding

Accidents are also caused by the ladders falling or the climber losing his balance or failure of scaffolds. As such, utmost care should be taken as ladder and scaffolding are extensively used for maintenance and construction purpose. Some of the safe practices as listed below are to be observed before commencement of work.

- 5.5.1 Adequate and safe means of access and exit shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevations shall not be permitted.
- 5.5.2 Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal and all ladders shall be maintained well for safe working condition.
- 5.5.3 Short ladder must not be tied together to give greater lengths. All ladders of 6 m or above should be tied to the structure on which they are resting to prevent from. An extra worker shall be engaged for holding the ladder if ladder is not securely fixed. If the ladder is used for carrying materials, suitable foot holds and handholds shall be provided on the ladder. The ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical). Ladders shall not be used for climbing carrying materials in hands. While climbing

both the hands shall not be free.

- 5.5.4 The free length must extend by 1.5 meters above the point of landing but should not be more than $1/4^{\text{th}}$ of the ladder length. No portable single ladder shall be over 9 meter in length. Metal ladders may not be used for electrical work.
- 5.5.5 Scaffolding or staging more than 3.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a standard guard rail properly attached, bolted, braced or otherwise secured at least 1.0 m high above the floor or platform of such scaffolding or staging. The guard rail shall extend along the entire exposed length of the scaffolding with only such opening as may be necessary for the delivery of materials. Standard railing shall have posts not more than 2 m apart and an intermediate rail halfway between the floor or platform of the scaffolding and the top rail. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure. Scaffolding and ladder shall conform to relevant IS specification (IS: 3696). Timber/Bamboo scaffolding shall not be used.
- 5.5.6 Working platforms of scaffolds shall have toe boards at least 15 cm in height to prevent materials from falling down.
- 5.5.7 Every part of scaffolding must be of sound construction. Steel planks used in scaffolds should be carefully inspected and should be tied on both sides with suitable fixing arrangements to the pipes. Scaffolding must not be overloaded.
- 5.5.8 The Steel pipe & clamp to be used must be of good quality. The spacing between the vertical & horizontal members of the scaffolding should not be more than 1.5m and 1 meter respectively. The scaffolding should be further strengthened with cross bracing and stays.
- 5.5.9 The scaffolds should be provided with short climbs ladders for safe ascending/ descending of workmen in the job. Only those workmen who are well trained/ experienced in erecting scaffolding should be engaged for scaffolding work. The men working in the actual erection/dismantling of the scaffolding and all persons using the scaffolding must use appropriate PPEs.
- 5.5.10 A sketch of the scaffolding proposed to be used shall be prepared and approved by the Engineer-in charge, prior to start of erection of scaffolding. All scaffolds shall be examined by Engineer-In-Charge before use.
- 5.5.11 Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally and if the height of the platform or gangway or stairway is more than 3.5 m above ground level or floor level, they shall be closely boarded, shall have adequate width for easy movement of persons and materials and shall be suitably guarded.
- 5.5.12 The planks used for working platform shall not project beyond the end supports to a distance exceeding four times the thickness of the planks used. The planks shall be rigidly tied at both ends to prevent sliding and slippage. The thickness of the planks shall be adequate to take load of men and materials and shall not collapse.
- 5.5.13 Each opening in the floor of a building or at a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing.
- 5.5.14 Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9 m in length. For ladders up to 3m in length the width between side rails in the ladder shall in no case be less than 300 mm. For longer ladders this width shall be increased by at least 20 mm for each additional meter of length. Step spacing shall be uniform and shall not exceed 300 mm.
- 5.5.15 Adequate precautions shall be taken to prevent danger from electrical lines and equipment. No scaffolding, ladder, working platform, gangway runs, etc. shall exist within 3 meters of any uninsulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipments are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

5.6 Lifting/Hoisting Equipment and Erection

Accidents do happen while working overhead or due to failure or unsafe use of hoisting equipment. As such, adequate care must be taken to prevent it. The following are some of the precautions to ensure safety of the workmen engaged by the contractor:

- 5.6.1 Contractors involved in handling of any material overhead must install necessary barricades, warning signs or take any other steps necessary to prevent others from walking/standing beneath the load.
- 5.6.2 Hoisting machines, tackles including their attachments, anchorage and supports must conform to the good mechanical construction, sound materials and adequate strength and free from patent defect and shall be preserved in good condition.
- 5.6.3 All equipments like crane, chain blocks, sling, rope including all other material handling equipments must have valid load test certificates.
- 5.6.4 Thorough inspection and load testing of lifting machines and tackles shall be done by a competent person at least once every 12 months and records of such inspection and testing shall be maintained.
- 5.6.5 Every crane driver or hoisting appliances operator shall be properly qualified and no person below the age 21 years should be in charge of any hoisting machine.
- 5.6.6 Every hoisting machine and all gears shall be plainly marked with the safe working load. No part of any machine or gear shall be loaded beyond the safe working load (SWL).
- 5.6.7 In case of IPR's machines, the safe working load shall be notified by Engineer-in-charge. For contractor's machines, the contractor shall notify the safe working load to Engineer-in-charge.
- 5.6.8 Motors, gearing transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with safe guards.
- 5.6.9 No cranes shall be left unattended with hanging load and on completion of work, the boom/jib of the crane may be brought down and kept in horizontal condition.
- 5.6.10 No crane including hydra crane shall be allowed to move on road with suspended load.

5.7 Welding and Gas Cutting

- 5.7.1 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.
- 5.7.2 Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.
- 5.7.3 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.
- 5.7.4 Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on persons or flammable materials. Adequate ventilation shall be provided while welding in confined space.
- 5.7.5 Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter glasses of appropriate shade shall be worn as face protection.
- 5.7.6 Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied, cleaned thoroughly and it is made certain that no flammable material is present.
- 5.7.7 Fire extinguisher shall be available near the location of welding operations. Prior permission shall be obtained from safety section for working at vulnerable areas and operating areas before flame cutting/welding is taken up.

5.7.8 Tarpaulin, if used should be of fire retardant.

5.7.9 For electric (Arc) welding the following additional safety precautions shall be taken:

- When electrical welding is undertaken near pipe lines carrying flammables, such pipe lines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.
- Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.
- Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.

5.7.10 The cylinders containing poisonous/toxic or inflammable / explosive gas like Oxygen, Acetylene, Hydrogen, Ammonia, Chlorine, CO₂ etc. shall be handled safely taking due cares. To handle / shift such cylinders a special trolley / cage meant for it must be used but in no case it should be rolled.

5.7.11 No domestic LPG cylinder is allowed for Hot Work such as Gas Welding / Gas Cutting.

5.7.12 A person must remain in the area for a minimum period of 30 minutes after hot work is completed to ensure the site is safe. Welding machine shall be switched off after the completion of work.

5.8 Grinding

5.8.1 All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.

5.8.2 Grinding wheels of specified diameter only shall be used on a grinder- portable or pedestal - in order not to exceed the prescribed peripheral speed.

5.8.3 Goggles shall be used during grinding operation.

5.9 Painting

5.9.1 The Contractor shall not employ women on the work of painting with products containing lead in any form. Only men above the age of 18 years shall be employed on the work with lead paint.

5.9.2 Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national/regional language, "SMOKING - STRICTLY PROHIBITED" shall be displayed in the vicinity where painting is in progress or where paints are stored.

5.9.3 When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. If adequate ventilation cannot be provided, workers shall wear suitable respirators.

5.9.4 Epoxy resins and their formulations used for painting shall not be allowed to come in contact with the skin. The workers shall use plastic gloves and/or suitable barrier creams.

5.9.5 Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.

5.10 Radiography

5.10.1 Only properly trained, qualified personnel shall be allowed to use radiation producing equipment or handle radioactive source.

5.10.2 Radiography works may be carried out preferably after office hours or on holidays.

5.10.3 The following are some basic rules to be followed:

- The ionisation radiation source shall not be left unattended.
- Radiation film and dose meter shall be used.
- The exposed area shall be clearly identified, barricaded by rope or other effective means

and internationally recognized symbol for radiation shall be placed around the perimeter of any area which may be affected by radiation.

- Contractor shall coordinate with safety officer to ensure that the dose rate at barricade does not exceed 0.75 milirems per hour.

5.11 Maintenance of Equipment

- 5.11.1 Disconnect the electrical power before starting the mechanical maintenance of the equipment/machine.
- 5.11.2 During the maintenance of equipment/machine, it should be doubly ensured that the machine does not move unexpectedly causing injury to the person involved.
- 5.11.3 Full proof lockout system or power lock off system should be followed. Power lock off system shall include the electrical power, energy stored in springs, suspended parts or any other potential power sources.
- 5.11.4 A highly legible information plate should be kept near the equipment/ machine under maintenance giving the details of work being carried-out, warning instructions etc., to enable the workers, supervisors or any visitors to keep away.
- 5.11.5 Removal of such plates immediately after the maintenance, repair etc., shall be -insured.
- 5.11.6 Instructions from the machine manufacturers' service/installation book should be followed during maintenance of the equipment.
- 5.11.7 Only trained personnel should be employed for carrying out maintenance, repair, adjustment etc.
- 5.11.8 Identified tools should be used to carry out such works.
- 5.11.9 Guards should be replaced immediately after the maintenance work.
- 5.11.10 Eli Chips and debris must be swept up and properly disposed.

6. REPORTING FORM

6.1 Near Miss Reporting Form

(This form may be filled and submitted to the Safety Section within 48 hours from the incident time)

1. Name of Person Affected/Observed Near miss:	2. Group/Division/Section:
3. Designation:	4. Location of Near Miss:
5. Date & Time of Near Miss:	6. Contact no:/Ext. No.:
7. Near Miss Description: <i>(Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)</i> ----- ----- ----- ----- ----- ----- -----	
8. Possible Damage that might have happened: (i) (ii)	
9. Corrective Actions Proposed to prevent reoccurrence of such near miss incident(s): 	

Submitted By:

Signature:

Name:

Date:

6.2 Incident Reporting Form

(This form is to be filled and submitted for all incidents except near miss to safety section within 72 hours from the incident time)

C. PERSONNEL INFORMATION

Name of Injured:		PR No.:
Group:		Contact No./ Ext. No.:
Incident Site:	Employee Category: () Permanent Employee () Project Employee () Contract () AMC () TPIA () Service Provider/Vendor () Other Category	

B. CATEGORY OF INCIDENT

First aid case	
Medical case	
Asset/Equipment/Property damage	
Vehicle incident	
Fire	
Fatal Accident	

C. INCIDENT INFORMATION

Date / Time of Incident	Date/Time Reported To Group Leader
Person Reporting Incident	
Incident Description:	
Injury / Illness Description:	

H. TREATMENT INFORMATION

Treatment Description		
Treatment Administered By	Date Of Treatment	Time Of Treatment
Phone No of clinic / hospital	Name of Clinic/Hospital:	
Pl. attach medical officer's prescription for medical treatment: -	Released from Hospital Date / Time: -	

I. INITIAL CORRECTIVE ACTION INFORMATION

Immediate Causes of incident:
Initial Corrective actions taken 1. 2. 3.

Prepared By:

Sign:
Name:
Designation:
Date:

Reviewed By:

Sign:
Name:
Designation:
Date:

SECTION 5: MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY INSTITUTE OR ITS CONTRACTORS

1. APPLICATION

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

2. DEFINITION

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

3.FIRST-AID FACILITIES

- (i) At every work place there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.
- (ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:
 - (a) For work places in which the number of contract labour employed does not exceed 50 - Each first-aid box shall contain the following equipments :-
 - 1. 6 small sterilized dressings.
 - 2. 3 medium size sterilized dressings.
 - 3. 3 large size sterilized dressings.
 - 4. 3 large sterilized burn dressings.
 - 5. 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
 - 6. 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
 - 7. 1 snakebite lancet.
 - 8. 1 (30 gms.) bottle of potassium permanganate crystals.
 - 9. 1 pair scissors.
 - 10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
 - 11. 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
 - 12. Ointment for burns.
 - 13. A bottle of suitable surgical antiseptic solution.
 - (b) For work places in which the number of contract labour exceed 50. Each first-aid box shall contain the following equipments.
 - 1. 12 small sterilized dressings.
 - 2. 6 medium size sterilized dressings.
 - 3. 6 large size sterilized dressings.
 - 4. 6 large size sterilized burn dressings.
 - 5. 6 (15 gms.) packets sterilized cotton wool.

6. 1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.
7. 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
8. 1 roll of adhesive plaster.
9. 1 snake bite lancet.
10. 1 (30 gms.) bottle of potassium permanganate crystals.
11. 1 pair scissors.
12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes/Government of India.
13. A bottle containing 100 tablets (each of 5 gms.) of aspirin.
14. Ointment for burns.
15. A bottle of suitable surgical antiseptic solution.

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

4. DRINKING WATER

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

5. WASHING FACILITIES

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

6. LATRINES AND URINALS

- (i) Latrines shall be provided in every work place on the following scale namely:-

- (a) Where female are employed there shall be at least one latrine for every 25 females.
- (b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be up to the first 100, and one for every 50 thereafter.

- (ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
- (iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting materials and shall be cement washed inside and outside at least once a year, Latrines shall not be of a standard lower than borehole system.
- (iv)(a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers “For Men only” or “For Women Only” as the case may be.
- (b) The notice shall also bear the figure of a man or of a woman, as the case may be.
- (v) There shall be at least one urinal for male workers up to 50 and one for female workers up to fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 and one for every 100 or part thereafter.
- (vi)(a)The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
- (b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.
- (vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.
- (viii) Disposal of excreta :-Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a

pucca tank prepared for the purpose and covering it with a 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

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

7. PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 sq. ft) per head.

Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. CRECHES

- (i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a, b & c.
- (ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.
- (iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.
- (iv) The contractor shall provide one ayah to look after the children in the crèche when the number of women workers does not exceed 50 and two when the number of women workers exceeds 50.
- (v) The use of the rooms earmarked as crèches shall be restricted to children, their attendants and mothers of the children.

9. CANTEENS

- (i) In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labours numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.
- (ii) The canteen shall be maintained by the contractor in an efficient manner.
- (iii) The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.
- (iv) The canteen shall be sufficiently lighted at all times when any person has access to it.

- (v) The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colour washed at least once in each year. Provided that the inside walls of the kitchen shall be lime-washed every four months.
- (vi) The premises of the canteen shall be maintained in a clean and sanitary condition.
- (vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.
- (viii) Suitable arrangements shall be made for the collection and disposal of garbage.
- (ix) The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.
- (x) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square meter (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.
- (xi) (a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.

(b) Washing places for women shall be separate and screened to secure privacy.
- (xii) Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.
- (xiii) (a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipments necessary for the efficient running of the canteen.

2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
2. A service counter, if provided, shall have top of smooth and impervious material.

3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipments.
- (xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.
- (xv) The charges for food stuffs, beverages and any other items served in the canteen shall be based on No profit, No loss" and shall be conspicuously displayed in the canteen.
- (xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:
 - (a) The rent of land and building.
 - (b) The depreciation and maintenance charges for the building and equipments provided for the canteen.

- (c) The cost of purchase, repairs and replacement of equipments including furniture, crockery, cutlery and utensils.
 - (d) The water charges and other charges incurred for lighting and ventilation.
 - (e) The interest and amounts spent on the provision and maintenance of equipments provided for the canteen.
- (xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. ANTI-MALARIAL PRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge including the filling up of any borrow pits which may have been dug by him. 11. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

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

SECTION 6: CONTRACTOR'S LABOUR REGULATIONS WITH APPENDICES

1. SHORT TITLE

These regulations may be called the Institute Contractors Labour Regulations. 2

2. DEFINITIONS

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

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

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

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

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

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

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

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

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

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

b) Where the minimum wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at

the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6 days.

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

4. DISPLAY OF NOTICE REGARDING WAGES ETC.

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

5. PAYMENT OF WAGES

- (i) The contractor shall fix wage periods in respect of which wages shall be payable.
- (ii) No wage period shall exceed one month.
- (iii) The wages of every person employed as contract labour in an establishment or by a contractor where less than one thousand such persons are employed shall be paid before the expiry of seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which he wages are payable.
- (iv) Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.
- (v) All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
- (vi) Wages due to every worker shall be paid to him direct or to other person authorised by him in this behalf.
- (vii) All wages shall be paid in current coin or currency or in both.
- (viii) Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.
- (ix) A notice showing the wages period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgment.
- (x) it shall be the duty of the contractor to ensure the disbursement of wages in the presence of the Junior Engineer or any other authorised representative of the Engineer in-Charge who will be required to be present at the place and time of disbursement of wages by the contractor to workmen.
- (xi) The contractor shall obtain from the Junior Engineer or any other authorised representative of the Engineer-in-Charge as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum Muster Roll" as the case may be in the following form:

"Certified that the amount shown in column No..... has been paid to the workman concerned in my presence on..... at....."

6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

- (i) The wages of a worker shall be paid to him without any deduction of any kind except the following
 - (a) Fines
 - (b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
 - (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.
 - (d) Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.
 - (e) Any other deduction which the Central Government may from time to time allow.
- (ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner. Note :- An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-X
- (iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.
- (iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the total wages. payable to him in respect of that wage period.
- (v) No fine imposed on any worker shall be recovered from him by installment, or after the expiry of sixty days from the date on which it was imposed.
- (vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

7. LABOUR RECORDS

- (i) The contractor shall maintain a **Register of persons employed** on work on contract in Form XIII of the CL (R&A) Central Rules 1971 (Appendix IV)
- (ii) The contractor shall maintain a **Muster Roll** register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).
- (iii) The contractor shall maintain a **Wage Register** in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI)
- (iv) **Register of accidents** - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
 - a) Full particulars of the labourers who met with accident.
 - b) Rate of Wages.
 - c) Sex

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

(v) The contractor shall maintain a **Register of Fines** in the Form XII. of the CL (R&A) Rules 1971 (Appendix-XI)

The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omissions for which fines can be imposed (Appendix-X)

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

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

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

8. ATTENDANCE CARD-CUM-WAGE SLIP

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

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

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

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

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

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

9. EMPLOYMENT CARD

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

10. SERVICE CERTIFICATE

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

11. PRESERVATION OF LABOUR RECORDS

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

12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY

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

13. REPORT OF LABOUR OFFICER

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

i) The Acting Chief Administrative Officer shall arrange payments to the labour concerned within 45 days from the receipt of the report form the Labour Officer or the Centre Director as the case may be.

14. APEAL AGAINST THE DECISION OF LABOUR OFFICER

Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Centre Director within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Acting Chief Administrative Officer but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER

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

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

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

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

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

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

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

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

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

16. INSPECTION OF BOOKS AND SLIPS

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

17. SUBMISSIONS OF RETURNS

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

18. AMENDMENTS

The Institute / Government may from time to time add to or amend the regulations and on any question as to the application/Interpretation or effect of those regulations the decision of the Centre Director shall be final.

PROFORMA OF REGISTERS

Appendix 'I' Register of Maternity Benefits (Clause 19F)

1. Name and address of the contractor:

2.Name and location of the work:-

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

Date of delivery /miscarriage	Date on which maternity leave commenced and ended			
	In case of Delivery		in case of mis-carriage	
	Commenced	Ended	Commenced	Ended
	7	8	9	10

Leave pay paid to the employee

In case of delivery		In case of miscarriage		Remarks
Rate of leave pay	Amount paid	Rate of leave pay	Pay amount paid	
11	12	13	14	15

Appendix 'II'

SPECIMEN FORM OF THE REGISTER, REGARDING MATERNITY BENEFIT ADMISSIBLE TO THE CONTRACTOR'S LABOUR

Name and address of the contractor

Name and location of the work

1. Name of the woman and her husband's name:
2. Designation:
3. Date of appointment:
4. Date with months and year in which she is employed:
5. Date of discharge / dismissal, if any:
6. Date of Production of certificates in respect of pregnancy:
7. Date on which woman informs about the expected delivery:
8. Date of delivery / miscarriage/ death:
9. Date of production of certificate in respect of delivery / miscarriage:
10. Date with amount of maternity / death benefit paid in advance of expected delivery:
11. Date with amount of subsequent payment of maternity benefit:
12. Name of person nominated by the women to receive the payment of the maternity benefit after her death:
13. If the woman dies, the date of her death, the name of the person to whom maternity benefit amount was paid, the month thereof and the date of payment:
14. Signature of the contractor authenticating entries in the register:
15. Remark column for the use of inspecting officer:

Appendix 'III'

Labour Board

1. Name of Work:
2. Name of Contractor:
3. Address of contractor
4. Name of Labour Officer of institute:
5. Name of Labour Enforcement Officer:
6. Name of Labour Enforcement Officer:

Sl.N o	Category	Minimum Wedge fixed	Actual wedge paid	Number Present	Remarks

Weekly Holiday:

Wage Period:

Date of Payment of wages:

Working Hours:

Rest interval:

Appendix ' IV'

Form XIII (See Rule 75)

Register of workmen employed by contractor

Name and Address of contractor

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

Nature and location of work.

Name and address of principal Employer.

Si. No.	Name and surname of workmen	Age as on	Father's / Husband and 's name	Nature employment / designation	Permanent addresses of workmen	Local Address	Date of employment	Signature or thumb impression	Date of termination no employment	Reason	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

Appendix 'V'

Form XVI

Muster Roll

Name and Address of contractor:

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

Nature and location of work.

Name and address of Principal Employer.

For the month of / fortnight:

Si. No .	Name of Workmen	Father's / Husband's Name	Sex	Dates					Remarks
1	2	3	4	5					6
				1	2	3	4	5	

Appendix 'VI'

Form XVII (see rule 78(2)(a))

REGISTER OF WAGES

Name and Address of contractor:

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

Nature and location of work.

Name and address of Principal Employer.

S l. N o	Na me of wor kme n	Serial No. in the regist er of work men	Designat ion/natu re of work done	No . of da ys wo rke d	Uni ts of wor k don e	Dail y rate of wag es price rate	Amount of wages earned						Net amo unt paid	Signatur e or thumb impressi on	Initi al of contr actor or his repe senti ve
							Bas ic Wag e	Dear ness allo wan ce	Ov er Ti me	Oth er pay men t	T ot al	D ed uc ti o n			
1	2	3	4	5	6	7	8	9	10	11	1 2	1 3	14	15	16

Appendix 'VII'

(Observe)

Wage Card No.

WAGE CARD

Name and address of contractor

Date of Issue

Name and location of work

Designation

Name of workmen

Month/Fortnight

Rate of wages

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

Morning:

Rate:

Evening:

Amount

Initial:

Received from

the sum of Rs.

On amount of my wages

The wages card is valid for one month from the date of issue.

Signature

Appendix 'VII'

(Reserve)

FORM XIX

(See Rule 78(2)(b))

WAGES SLIP

Name and address of contractor:

Name and Father's/Husband's name of workman:

Nature and location of work:

For the week/Fortnight/Month ending:

1. No. of days worked:
2. No. of units worked in case of piece:
3. Rate of daily wages/piece rate:
4. Amount of overtime wages:
5. Gross wages payable:
6. Deduction, if any:
7. Net amount of wages paid:

Initial of the contractor or his representative

Appendix 'VIII'

FORM XIV

(See Rule 76)

EMPLOYMENT CARD

Name and address of Contractor:

Name and address of establishment in under:

Name of work and location of work:

Name and address of principal employer:

1. Name of the workmen:
2. Sl.No. in the register of workman:
3. Nature of employment/designation
4. Wage rate (with particulars of unit in:
Case of piece work)
5. Wage period
6. Tenure of employment
7. Remark:

Signature of Contactor

Appendix 'IX'

FORM XV

(See Rule 77)

SERVICE CERTIFICATE

Name and Address of contractor:

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

Name and address of workmen.

Name and address of principal employer

Age or date of birth.

Identification Mark.

Father's / Husband's Name.

Sl.No	Total period for which employed		Nature of work	Rate of wage (with particulars of unit in case of piece work)	Remark
	From	To			
1	2	3	4	5	6

Signature:

Appendix 'X'

LIST OF ACTS AND OMISSIONS FOR WHICH FINES CAN BE IMPOSED

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

1. Wilful insubordination or disobedience, whether alone or in combination with other.
2. Theft fraud or dishonesty in connection with the contractors beside a business or property of
3. Taking or giving bribes or any illegal gratifications
4. Habitual late attendance.
5. Drunkenness lighting, riotous or disorderly or indifferent behavior.
6. Habitual negligence.
7. Smoking near or around the area where combustible or other materials are locked.
8. Habitual indiscipline.
9. Causing damage to work in the progress or to property of the Institute or of the contractor.
10. Sleeping on duty.
11. Malingering or slowing down work.
12. Giving of false information regarding name, age father's name, etc.
13. Habitual loss of wage cards supplied by the employers.
14. Unauthorized use of employer's property of manufacturing or making of unauthorized particles at the workplace.
15. Bad workmanship in construction and maintenance by skilled workers which is not approved by the Department and for which the contractors are compelled to undertake rectifications.
16. Making false complaints and / or misleading statements.
17. Engaging on trade within the premises of the establishments.
18. Any unauthorized divulgence of business affairs of the employees.
19. Collection or canvassing for the collection of any money within the premises of an establishment unless authorized by the employer.
20. Holding meeting inside the premises without previous sanction of the employers.
21. Threatening or intimating any workman or employer during the working hours within the premises.

Appendix 'XI'

FORM XII

(See Rule 78(2)(d))

REGISTER FINE

Name and Address of contractor:

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

Name and location of work.

Name and address of principal employer

Sl. No.	Name of work men	Father's/Husband's name	Designation/nature of employment	Act/misconduct of which fine imposed	Date of Offence	Whether Work men show ed cause again st fine	Name of person in whose presence employ ee's explan ation was heard	Wage period and wage payable	Amount of Impo sed	Date on which relea sed	Remark
1	2	3	4	5	6	7	8	9	10	11	12

Appendix 'XII'

FORM XX

(See Rule 78(2)(b))

REGISTER OF DEDUCTION FOR DAMAGE OR LOSS

Name and Address of contractor:

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

Name and location of work.

Name and address of principal employer

Sl. No.	Name of workmen	Father's/Husband's name	Designation/nature of employment	Particular of damage or loss	Date of damage or loss	Whether workmen shown cause against deduction	Name of person in whose presence employee's explanation was heard	Amount of Imposed	No. of Instalment	Date Of Recovery		Remark
										First Instalment	Last Instalment	
1	2	3	4	5	6	7	8	9	10	11	12	13

Appendix 'XIII'

FORM XXII

(See Rule 78(2)(d))

REGISTER OF ADVANCES

Name and Address of contractor:

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

Name and location of work.

Name and address of principal employer

Sl. No.	Name of work men	Father's/Hus band's name	Designation/ nature of employment	Wag e perio d and wage s paya ble	Date of amou nt of adva nce given	Purpo sed for which advan ce made	No. of install ment by which advanc e to be paid	Date and amount of each install ment	Date on which last install ment was repaid	Rem ark
1	2	3	4	5	6	7	8	9	10	11

Appendix ‘XIV’

FORM XXIII

(See Rule 78(2)(d))

REGISTER OF OVERTIME

Name and Address of contractor:

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

Name and location of work.

Name and address of principal employer

Sl.No.	Name of work men	Father's/Husband's name	Sex	Designation/nature of employment	Dates on which overtime worked	Total overtime worked on production in case of price rated work	Normal rates of wages	Overtime rates of wages	Overtime earnings	Rates on which overtime wages paid	Remark
1	2	3	4	5	6	7	8	9	10	11	12

APPENDIX XV

Note for appointment of Arbitrator [Refer Clause 25]

To

The Centre Director, CPP-IPR, Nazirakhat, Sonapur, Assam-782402

Dear Sir,

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

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

Specimen signatures of the applicant

(only the person/authority who signed the contract should sign)

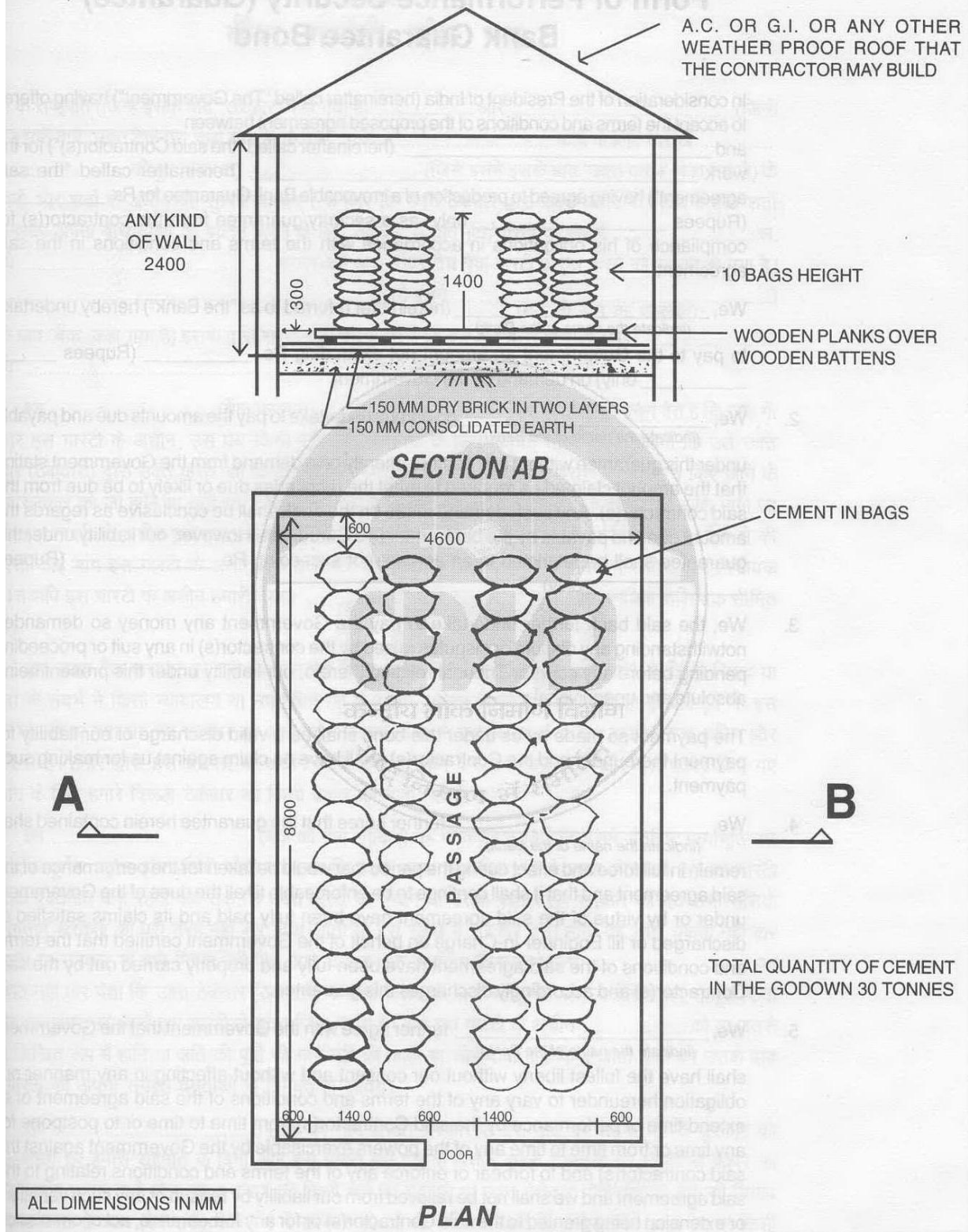
I/we certify that the information given above is true to the best of my/our knowledge, I/we enclose following documents.

1. Statement of claims with amount of claims.
- 2.

Yours faithfully,

(Signatures)

सीमेन्ट गोदाम का रेखाचित्र / SKETCH OF CEMENT GODOWN



SECTION - 7

FORMAT / PROFORMA / GUARANTEE BONDS

**Form of Earnest Money Deposit
Bank Guarantee Bond**

Whereas, contractor (Name of Contractor) (Hereinafter called “the Contractor”)
has submitted his tender dated (Date) for

**Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of
Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia,
Sonapur, Kamrup (M), Assam – 782402** (Name of work) (Hereinafter called “the Tender”)

KNOW ALL PEOPLE by these presents

that we (Name of Bank) having our registered
office at (Hereinafter called “the bank”) are bound unto

Centre of Plasma Physics - Institute for Plasma Research (hereinafter called “Institute”)

in the sum of Rs. (Rs. In words)
for which payment well and truly to be made to the said Institute the bank binds itself, his successors and
assigns by these presents.

SEALED with the Common Seal of the said Bank this day of 20

THE CONDITIONS of this obligation are:

- 1) If after tender opening the Contractor withdraws his tender during the period of validity of tender
(including extended validity of tender) specified in the form of Tender;
- 2) If the contractor having been notified of the acceptance of his tender by the Institute ;
(a) Fails or refuses to execute the form of Agreement in accordance with the Instruction to
contractor, if required;

OR

- (b) Fails or refuses to furnish the performance Guarantee, in accordance with the provisions of
tender document and instructions to contractor,

We undertake to pay to the Institute for Plasma Research either up to the above amount or part thereof
upon receipt of his first written demand, without the Institute having to substantiate his demand, provided
that in his demand the Institute will note that the amount claimed by his is due to him owing to the
occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* After the deadline
for submission of tender as such deadline is stated in the Instructions to contractor or as it may be
executed by Centre of Plasma Physics - Institute for Plasma Research, notice of which extension(s) to the
Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the
above date.

DATE

SIGNATURE OF THE BANK

WITNESS
(SIGNATURE, NAME AND ADDRESS)

SEAL

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

Form of Performance Security (Guarantee)
Bank Guarantee Bond

Inconsideration of the Centre Director, CPP-IPR (hereinafter called The Director) having offered to accept the terms and conditions of the proposed agreement between **Centre of Plasma Physics - Institute For Plasma Research** and _____ (hereinafter called “the said Contractor(s)”) for the work **Site Grading Works including Roads, Storm Water Drainage, Retaining Wall and Construction of Canteen Building including Plumbing and Electrification at CPP-IPR Nazirakhat, Tepesia, Sonapur, Kamrup (M), Assam – 782402** (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for Rs. _____ (Rupees _____ only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, _____ (hereinafter referred to as ”the Bank”) hereby undertake (indicate the name of the Bank) to pay to the Institute an amount not exceeding Rs. _____ (Rupees _____ only) on demand by the Government.
2. We, _____ (indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Institute /Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only)
3. We, the said bank further undertake to pay the Institute / Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.
4. We, _____ further agree that the guarantee herein contained shall (indicate the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Institute / Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Centre Director on behalf of the Institute / Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, _____ (indicate the name of the Bank) further agree with the Institute / Government that the Institute / Government) shall have the fullest liberty without our consent and without affecting in any manner our obligation 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 Government 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 of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, _____(indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Institute / Government in writing.
8. This guarantee shall be valid up to _____ unless extended on demand by the Institute / Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to As. Rs. _____ (Rupees _____ only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the _____ day of _____ for _____ (indicate the name of the Bank)

INDENTURE FOR SECURED ADVANCE

(For use in cases in which the contract is for finished work and the contractor has entered into an agreement for the execution of certain specified quantity of work in a given time.)

Centre of Plasma Physics - Institute for Plasma Research

State: Assam **Administration:** CPP-IPR

THIS INDENTURE made the _____ day of _____ 20 _____

BETWEEN _____ (hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors, administrators and assigns) of the one part and **Centre of Plasma Physics – Institute for Plasma Research** (hereinafter called the Institute which expression shall where the context so admits or implies be deemed to include his successors in office and assigns) of the other part.

WHEREAS by an agreement dated _____ (hereinafter called the said agreement) the contractor has agreed.

AND WHEREAS the contractor has applied to the Institute that he may be allowed advance on the security of materials absolutely belonging to him and brought by him to the site of the works, he subject of the said agreement for use in the construction of such of the works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges).

AND WHEREAS the Institute has agreed to advance to the contractor the sum of Rs. _____ on the security of materials, the quantities and other particulars of which are detailed in -Part-II of a Running Account Bill (B) for the said works signed by the contractor on and the Institute has reserved to himself the option of making any further advances on the security of other materials brought by the contractor to the site of the said works.

NOW THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees _____ on or before the execution of these presents paid to the contractor by the Institute (the receipt where of the contractor both hereby acknowledge and of such further advance, if any, as may be made to him as aforesaid the contractor both hereby convenient and agree with the Institute and declare as follows:

1. That the said sum of Rupees _____ so advanced by the Institute to the contractor as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the contractor in or towards expenditure the execution of the said works and for no other purpose whatsoever.
2. That the materials detailed in the said Running Account Bill (B) which have been offered to and accepted by the Institute as security are absolutely the contractor's own property and free from encumbrances of any kind and the contractor will not make any application for or receives a further advance on the security of materials which are not absolutely his own property and free from encumbrance of any kind and the contractor indemnifies and Institute against all claims to any materials in respect of which an advance has been made to him as aforesaid.
3. That the materials detailed in the said Running Account Bill (B) and all other materials on the security of which any further advance or advances may hereafter to be made as aforesaid (hereinafter called the said materials) shall be used by the contractor solely in the execution of the said works in accordance with

the directions of the Engineer-in charge of the said works, Institute (hereinafter called "the Engineer-in charge) and in the terms of the said agreement.

4. That the contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe- custody and protections against all risks of the said materials and that until used in construction as aforesaid said materials shall remain at the site of the said works in the contractor's custody and on his own responsibility and shall at all times be open to inspection by the Engineer-in charge or any officer authorized by him. In the event of the materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree that is due to reasonable use and wear thereof the contractor will forthwith replace the same with other materials of like quality or repair and make good the same as required by the Engineer-in charge.

5. That the said materials shall not on any account be removed from the site of the works except with the written permission of the Centre Director or an officer authorized by Institute.

6. That the advance shall be repayable in full when or before contractor receives payment from the Institute of the price payable to him for the said works under the terms and provisions of the said agreement. Provided that if any intermediate payments are made to the contractor on account of work done there on the occasion of each such payment the Institute will be at liberty to make a recovery from the contractor's bill for such payment by deduction there from the value of the said materials than actually used in the construction and in respect of which recovery has not been made previously the value for this purpose being determined in respect of the each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

7. That if the contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances what may still be owing to the Institute shall immediately on the happening of such default be repayable by the contractor to the Institute together with interest thereon at twelve percent per annum from the date of respective dates of such advance or advances to the date of repayment and with all costs, charges, damages and expenses incurred by the Institute in or for the recovery thereof or the enforcement of this security or otherwise by reasons of the default of the contractor and contractor hereby convenient and agrees with the Institute to repay and pay the same respectively, to him accordingly.

8. That the contractor hereby charges all the said materials with the repayment to the Institute of the said sum of Rs. _____, and any further sum or sums advanced as aforesaid and all costs, charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is-hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and whenever the convenient for Payment and repayment herein before contained shall become enforceable and the money owing shall not be paid in accordance there with the Institute may at any time thereafter adopt all or any of the following courses as he may deemed best.

a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the contractor in accordance with the provisions in that behalf contained in the said agreement debiting the contractor with the actual cost of effecting such completion and the amount due in respect of advances under these present and crediting the contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the contractor he is to pay same to the Institute on demand.

b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sum, aforesaid repayable or payable to the Institute under these presents and pay over the surplus (if any) to the contractor.

c) Deduct all or any part of the money owing out of the security deposit or any sum due to the contractor under the said agreement.

9. That except in the event of such default on the part of the contractor as aforesaid interest on the said advances shall not be payable.

10. That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been herein before expressly provided for the same shall be referred to the Centre Director of the Institute, time being in force shall apply to any such reference.

IN WITNESS thereof the said _____ and _____ by the order under the direction of the Institute have hereinto set their respective hands the day and year first above written.

Signed, sealed and delivered by the said contractor in the presence of :

Signature

Name

Address

Witness

Signed by the order and direction of the Institute in the presence of:

Signature

Name

Address

Witness

Format to be enclosed for each bill for payment through Electronic Mode

To,
The Centre Director, CPP-IPR, Nazirakhat, Sonapur, Assam-782402

Sub : Bank Details for Payment through Electronic Mode

Sir,

It is requested that our payment may please be arranged through Electronic Mode. The details of bank are as under:

1. IFSC CODE

--	--	--	--	--	--	--	--	--	--	--	--	--	--

2. NEFT Code

--	--	--	--	--	--	--	--	--	--	--	--	--	--

***Note :** In case beneficiary's bank is State Bank of India (any branch in India) IFSC Code & NEFT Code may not be mentioned.*

3. Account No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--

Full Account No. for payment to be made through Electronic Mode.

4. Account Type. CURRENT A/C (11)/CASH CREDIT A/C (13)

5. MICR NO.

--	--	--	--	--	--	--	--	--	--	--	--

***Note :** 1st three digit & last of 3 digit of MICR No. should not be zero.*

6. Name of Bank :

7. Name of Branch :

8. Address of Bank :

I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for any reasons, I would not hold the user institution responsible and agree to discharge the responsibility expected of me as a participant under the scheme.

Yours faithfully,

()
Signature of authorised Officer
With Name, Designation & Company's seal.

GUARANTEE BOND FOR ANTI-TERMITE TREATMENT

(For Guarantee to be executed by contractors for removal of defects after completion of anti-termite treatment works)

This agreement made this _____ day _____ of two thousand and _____ between _____ M/s. _____
(hereinafter called "the Guarantor of the one part) and the Centre of Plasma Physics - Institute for Plasma Research (hereinafter called "the Institute" the other part.)

Whereas this agreement is supplementary to a contract (hereinafter called "the Contract) dated _____ and made between the Guarantor of the one part and the Institute of the other part whereby the Contractor interalia undertook to render the buildings and structure completely termite proof. AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structure will remain termite proof for ten years from the date of handing over of the building and or completion date of contract whichever is later.

NOW THE GUARANTOR hereby guarantees that the anti-termite treatment provided by him will render the structure completely termite proof and the minimum life of such anti-termite treatment shall be ten years to be reckoned from the date of handing over of the building and/or completion of the building whichever is later.

Provided that the Guarantor will not responsible for damages caused due to structural defects or misuse of premises/area.

a) Misuse of premises shall mean any operation which will disturb the chemical barrier like excavation under floors breaking of walls at G.L. disturbing the treatment already carried out.

The decision of the Centre Director with regard to cause of damage shall be final.

During this period of guarantee the guarantor shall make all the arrangements to do the post constructional anti-termite treatment in all the buildings in case of any termite nuisance being found in the building, to the satisfaction of the Engineer-in-Charge at the cost of guarantor and shall commence the work for such treatment within seven days from the date of calling upon him to rectify the defects, by the Engineer-in-Charge, failing which the work shall be got done by the Institute by some other contractor at the GUARANTOR'S COST and risk. The decision of the Centre Director as to the cost payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the anti-termite treatment or commits breach thereunder then the Guarantor will indemnify the principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by the Institute by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and/or cost incurred by the Institute the decision of the Centre Director will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor _____ and by _____
_____ and for and on behalf of
the Centre of Plasma Physics - Institute for Plasma Research on the day, month and year first above written.

SIGNED, sealed and delivered by (OBLIGATOR) in the presence of:

1.

2.

SIGNED FOR AND ON BEHALF OF CENTRE OF PLASMA PHYSICS - INSTITUTE FOR PLASMA
RESEARCH BY _____ in
the presence of: _____

1.

2.

GUARANTEE BOND FOR WATERPROOFING WORKS

(For Guarantee to be executed by contractors for removal of defects after completion of water-proofing works.)

This agreement made this _____ day of _____ two thousand and _____ between M/s. _____ (hereinafter called "the Guarantor of the one part) and the Centre of Plasma Physics - Institute for Plasma Research (hereinafter called "the Institute" of the other part.)

Whereas this agreement is supplementary to a contract (hereinafter called "the Contract) dated and made between the Guarantor of the one part and the Institute of the other part whereby the Contractor interalia undertook to render the buildings and structure such as roof of buildings, over head water tanks, underground tanks, lift pits, basement, toilets, etc. in the said contract recited completely water and leak proof.

AND WHEREAS THE GUARANTOR agree to give a guarantee to effect that at the said structure will remain water and leak proof for ten years from the date of handing over of the building and/or actual date of completion of work as recorded whichever is later.

NOW THE GUARANTOR hereby guarantee that waterproofing treatment provided by him will render the structures completely leak proof and the minimum life of such waterproofing treatment shall be ten years to be reckoned from the date of handing over of the building and/or actual date of completion of the work as recorded whichever is later.

Provided that the Guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or other structures or alteration and for such purpose:

- a) Misuse of structure shall mean any operation which will damage water-proofing treatment, like chopping of fire wood and things of the same nature which might cause damage to the structure;
- b) Alteration shall mean construction of an additional story or a part of the roof or construction adjoining to existing roof whereby water-proofing treatment is removed in parts;
- c) Damaging or puncturing of the waterproofing treatment provided to over head tanks or basement or underground tank or lift pit, for providing any P .H./Electric connections or any other reasons whatsoever;
- d) The decision of the Centre Director with regard to cause of leakage shall be final.

During this period of guarantee the guarantor shall make good all the defects and in case of any defect being found, render the building waterproof to the satisfaction of the Engineer-in-Charge at the cost of the guarantor and shall commence the work for such rectification within seven days from the date of issue of the notice, from the Engineer-in-Charge calling upon him to rectify the defects, failing which the work shall be got done by the Institute by some other contractor at the GUARANTOR'S COST and risk. The decision of the Centre Director as to the cost payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the waterproofing or commits breach there under then the Guarantor will indemnify the Principal and his successors against all loss, damage, cost expense or otherwise which may be incurred by the Institute by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage

and/or cost incurred by the Institute the decision of the Centre Director will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____ and by _____ and for and on behalf of the Centre of Plasma Physics - Institute for Plasma Research on the day, month and year first above written.

SIGNED, sealed and delivered by (OBLIGATOR) in the presence of:

1.

2.

SIGNED FOR AND ON BEHALF OF THE CENTRE OF PLASMA PHYSICS - INSTITUTE FOR PLASMA RESEARCH BY

_____, in the presence of:

1.

2.

GUARANTEE BOND FOR LEAK PROOF ROOFING & SIDE CLADDING WORKS

(For Guarantee to be executed by contractors for removal of defects after completion of roofing & side cladding works.)

This agreement made this _____ day of _____ two thousand and _____ between M/s. _____ (hereinafter called "the Guarantor of the one part) and the Centre of Plasma Physics - Institute for Plasma Research (hereinafter called "the Institute" of the other part.)

Whereas this agreement is supplementary to a contract (hereinafter called "the Contract) dated and made between the Guarantor of the one part and the Institute of the other part whereby the Contractor inter alia undertook to render the buildings and structure such as roofing, side cladding with sheets of buildings in the said contract recited completely water and leak proof.

AND WHEREAS THE GUARANTOR agree to give a guarantee to effect that at the said structure will remain water and leak proof for ten years from the date of handing over of the building and/or actual date of completion of work as recorded whichever is later.

NOW THE GUARANTOR hereby guarantee that roofing & side cladding work provided by him will render the buildings completely leak proof for minimum of ten years to be reckoned from the date of handing over of the building and/or actual date of completion of the work as recorded whichever is later.

Provided that the Guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or other structures or alteration and for such purpose:

- a) Misuse of structure shall mean any operation which will damage roofing / side cladding, like chopping of fire wood and things of the same nature which might cause damage to the structure;
- b) Alteration shall mean construction of an additional story or a part of the roof or construction adjoining to existing roof whereby roofing / side cladding is removed in parts;
- c) Damaging or puncturing of the roofing / side cladding for providing any P .H./Electric connections or any other reasons whatsoever;
- d) The decision of the Centre Director with regard to cause of leakage shall be final.

During this period of guarantee the guarantor shall make good all the defects and in case of any defect being found, render the building leak proof to the satisfaction of the Engineer-in-Charge at the cost of the guarantor and shall commence the work for such rectification within seven days from the date of issue of the notice, from the Centre Director calling upon him to rectify the defects, failing which the work shall be got done by the Institute by some other contractor at the GUARANTOR'S COST and risk. The decision of the Centre Director as to the cost payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the leakproofing or commits breach there under then the Guarantor will indemnify the Principal and his successors against all loss, damage, cost expense or otherwise which may be incurred by the Institute by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage

and/or cost incurred by the Institute the decision of the Centre Director will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____ and by _____ and for and on behalf of the Centre of Plasma Physics - Institute for Plasma Research on the day, month and year first above written.

SIGNED, sealed and delivered by (OBLIGATOR) in the presence of:

- 1.
- 2.

SIGNED FOR AND ON BEHALF OF THE CENTRE OF PLASMA PHYSICS - INSTITUTE FOR PLASMA RESEARCH BY

_____, in the presence of:

- 1.
- 2.

Section-8

Technical Specifications

TECHNICAL SPECIFICATIONS

Part-A	Site Grading Work	Pages 250 – 254
Part-B	Road Work	Pages 255 – 284
Part-C	Civil and Plumbing Work	Pages 285 – 314
Part-D	Electrical Work	Pages 315 – 327
Part-E	Mode of Measurement	Pages 328 – 365
Part-F	Cement Consumption	Pages 366 – 366
Part-G	Mandatory Tests	Pages 367 – 369
Part-H	List of Approved Makes	Pages 370 – 372

PART A

TECHNICAL SPECIFICATIONS FOR SITE GRADING WORK

1.0 SCOPE OF WORK

The scope of work envisaged under this tender covers earth cutting, fitting and site grading.

2.0 CODES & STANDARDS

IS 2720 Part IV	Methods of tests for soil
IS 2720 Part V	Methods of tests for soils – Part 5, Determination of liquid & plastic limits.
IS 2720 Part VII	Methods of tests for soils – Part 6, Determination of shrinkage factors.
6-65-0016	Standard specification for classification of soil for earthwork in site grading.

NOTE: Latest edition of all codes and standards shall be followed.

3.0 GENERAL

- 3.1 Contractor shall maintain adequate drainage facilities at SITE at all times during the execution of work. Additional ditches, drains & such other temporary means to achieve this over and above what is shown in the drawings, shall be provided and maintained by CONTRACTOR at his own cost.
- 3.2 Adequate dewatering facilities like dewatering pumps and piping etc. shall also be provided by the contractor for this work, including dewatering during excavation etc. as required, at his own cost.

4.0 MATERIAL FOR EARTHWORK

- 4.1 Only soil considered suitable by the Engineer-in-charge shall be deployed for the construction and that considered unsuitable shall be disposed off, as directed by the Engineer-in-charge, at his own cost and no claim for compensation will be entertained.
- 4.2 The CONTRACTOR shall give the samples of soil he proposes to use for filling, along with the following characteristics of the samples, to Engineer-in-charge for approval, prior to

collection and use. The tests for these characteristics shall be done in a laboratory / test house as approved by Engineer-in-charge.

- a) Mechanical analysis or grain size analysis as per IS 2720 Part IV
 - b) Liquid limit as per IS 2720 Part V
 - c) Plastic limit as per IS 2720 Part V
 - d) Moisture density relationship as per IS 2720 Part VII
- 4.3 The soil used for filling shall be free from boulders, lumps, tree roots, rubbish or any organic deleterious matter.
- 4.4 Soil having plasticity index less than 20 shall be used for filling purpose.
- 4.5 Soil having laboratory maximum dry density of less than 1.5gm/cc shall not be used.
- 4.6 Care shall be taken to see that unsuitable waste material is disposed off in such a manner that there is no likelihood of its getting mixed with the material, proposed to be used, for filling.
- 4.7 The work shall be so planned and executed that the best available soil are reserved for the top portion of the embankments.

5.0 CUTTING TREES

- 5.1 All trees having girth above 30cms, which are not marked for preservation, shall be cut down and their roots dug up to a depth of 1 meter from the existing ground level.
- 5.2 All holes or hollows produced by digging up roots shall be carefully filled with approved soil including all leads and lifts, rammed and compacted to obtain 90% of maximum laboratory dry density of soil and leveled as directed.
- 5.3 All uprooted trees shall be stacked or disposed off as directed by Engineer-in-charge.

6.0 CLEARING AND STRIPPING

- 6.1 All the areas, including depressions, where filling or cutting is to be carried out shall be cleared and stripped completely of bushes, roots, vegetation, plantation trees, shrubs, trees up to 30cms girth, organic and other objectionable materials. All these shall be completely uprooted and virgin soil exposed and not merely scrapped at the surface. The roots of trees of girth up to 30cms shall be removed to minimum depth of 1M below the existing ground level and holes, hollows filled up with selected approved available soil within all leads and lifts and compacted to obtain 90% of laboratory dry density of soil as per IS 2720 Part VII and

leveled and leveled as directed by Engineer-in-charge. All soft patches must be worked out to removed soft soil and selected approved earth must be filled back and the areas (areas coming under filling) compacted to obtain 90% of maximum laboratory dry density of soil as per IS 2720 Part VII. The depth of stripping shall be generally 50 to 150mm as decided by Engineer-in-Charge.

- 6.2 Material obtained from clearing shall be stacked or disposed off as directed by Engineer-in-charge within a lead as per directions of Engineer-in-charge.

7.0 EARTHWORK IN EXCAVATION/ CUTTING

- 7.1 After cleaning and stripping of areas as specified above in clause no. 6, spot levels at intervals and pattern as decided by the Engineer-in-charge, shall be taken jointly by CONTRACTOR and Engineer-in-charge. Excavation / Cutting shall commence only after the levels are signed by the contractor as a token of his acceptance.
- 7.2 Excavation / cutting shall be carried out strictly as per the instruction of Engineer-in-charge.
- 7.3 If the contractor excavates / cuts beyond the required level, additional quantity of earthwork shall not be paid for. The excavation taken below the specified level shall be made good by filling with approved material, to the required compaction, at contractor's cost.
- 7.4 The final bed and sides of excavation must be leveled, dressed and compacted. In case of areas under excavations for site grading, the final surface shall be leveled, dressed and consolidated by means of sheep foot / power driven rollers to obtain maximum compaction. However, no rest control is required in such areas.
- 7.5 Shoring and strutting shall be adopted only with the permission of Engineer-in-charge in writing. Such shoring and strutting shall follow the necessary specification.
- 7.6 Provision for dewatering shall be governed by the relevant clauses.

8.0 EARTHWORK IN FILLING

- 8.1 After cleaning, stripping and consolidating of areas as specified above in clause no. 6, spot levels at intervals and pattern as decided by the Engineer-in-charge, shall be taken jointly by contractor and Engineer-in-charge. Filling shall commence only after the levels are signed by the contractor as a token of his acceptance. Approved fill material shall be spread in uniform layers not exceeding 15 cm in loose depth.

The contractor has to make his own approach and access roads from the borrow area to the demarcated filling areas. While the contractor may make use of such short cuts as may be available to him for earth movement from borrow areas to the filling areas, the owner does not guarantee any passage way or right of way for the contractor's work other than available at site. No claim shall also be admissible to the contractor on account of his having to take longer leads or routes for earth movement, than envisaged by him, either due to any road cutting, non availability of routes or any other grounds whatsoever.

- 8.2 All clods, lumps etc, shall be broken before compaction.
- 8.3 Successive layers of filling shall not be placed until the layer below has been thoroughly compacted and tested to satisfy the requirements laid down in this specification.
- 8.4 Prior to rolling the moisture content of material shall be brought to within plus or minus 2% of the optimum moisture content as described in IS 2720 part VII. The moisture content shall be preferably be on the wet side for potentially expansive soil.
- 8.5 After adjusting the moisture content as described in clause 8.4, the layers shall be thoroughly compacted either by sheep foot roller or power driven roller or vibratory roller, as approved by Engineer-in-charge till the specified maximum laboratory dry density is obtained.
- 8.6 Each layer shall be tested in field for density and accepted by Engineer-in-charge, subject to achieving the required density, before laying the next layer. A minimum of one test per 500 sqm for each layer shall be conducted.
- 8.7 If the layer fails to meet the required density, it shall be reworked or the material shall be replaced and method of construction altered as directed by Engineer-in-charge to obtain the required density.
- 8.8 The filling shall be finished in conformity with the alignment, levels, cross section and dimensions as shown in the drawings.

Earthen embankments shall be filled 300mm more on both sides, where heights is more than 1m and this extra filling shall be dressed, after compaction, in conformity with alignment, level, cross-section and dimensions as shown in the drawings, to achieve proper compaction in the slope. No extra payment shall be made in this regard.

8.9 Extra material shall be removed and disposed off as directed by the Engineer-in-charge.

8.10 Tolerances

General site grading, including cutting and filling in depressions shall be carried out to within up down tolerance plus minus 5cms of final lines, grades and slopes.

9.0 CLASSIFICATION OF SOIL

If soil of any classifications other than that specified in the SOR is met during excavation, the decision of the Engineer-in-charge as to the classification of soil, levels of the strata of different classifications and their locations shall be binding.

PART B

TECHNICAL SPECIFICATIONS FOR ROAD WORK

1.0 SCOPE OF WORK:

The scope of work envisaged under this tender covers road work of WBM Grade-2 & Grade-3, Prime Coat, Tack Coat, Carpeting and Seal Coat and road crossing of IT / Telephone Cable as per tender specifications, drawings and standards etc. In general, the scope of work covers the following but not limited to:

1. Widths of Formation or Road Way:

The widths of formation or roadway are the width of pavement or carriage way including separator (if any) and shoulder. It is the widths of the road embankment excluding the road side drain.

2. Setting out of Work:

A. Methodology:

1. Establish working bench marks at 250 m intervals on the road in question with the help of Reference Bench Mark in the area.
2. Establish centre line of the carriageway and have it referenced by marker pegs and chainage boards, set near the road land boundary at 50 m intervals. (In hills and on curves in plains, the intervals of reference pegs should be 20 m)
3. Prepare a schedule of reference dimensions and maintain the markers until the works reach finished formation level.
4. Verify the dimensions and levels, shown on the drawings or mentioned in contract documents, on the site and inform of any apparent errors or discrepancies.
5. The lines and levels of formation, side slopes, drainage works , carriage way and shoulders should be carefully set out and frequently checked, care being taken to ensure that correct gradients and cross sections are obtained everywhere.

3. Site Clearance:

A. Methodology:

1. The road land should be cleared of all materials unsuitable for the work by cutting, removing and disposing of all materials, such as trees, bushes, shrubs, stumps, roots, grass, weeds, top organic soil not exceeding 150 mm in thickness, rubbish etc. This should be in advance of earthwork operation.
2. Excavation below the ground level arising out of removal of trees, stumps, etc be filled in layers with suitable materials and compacted thoroughly with the help of hand rammers etc.
3. All trees, stumps, etc failing within the excavation and embankment lines should be cut to such depth below ground level that in no case these fall within 500 mm of the sub-grade. Beyond these limits, they need to be cut down to 1 m ground level.

4. Excavation:

A. Methodology:

1. The limits of excavation should be set out true to lines, curves, slopes, grades and sections as shown on the drawings. The work of excavation should be carried out in conformity with the drawings.
2. Undertake stripping of top soil before excavation if so required under the contract and stack it suitably for reuse.
3. After excavation, the sides of excavated area should be trimmed and the area contoured to minimize erosion and ponding, allowing natural drainage to take place.
4. In case in situ soil to be used for sub-grade, loosen the soil and compact to a thickness of 300 mm with a suitable roller to 100 per cent standard proctor compaction density.
5. In hilly area, special attention needs to be paid to side slopes and side drains in cutting.

B. Quality Control Requirements:

(1) Horizontal Alignments :

- (i) The horizontal alignments should be reckoned with respect to the centre line of the carriageway as shown on the drawings. The edges of the roadways as constructed should be correct within a tolerance limit of (+,-) 30 mm.
- (ii) No point on the slopes shall vary from the designated slopes by more than 150 mm measured at right angle to the slope.

(2) Surface Level :

The tolerance for surface level of the finished cut formation should be (+,-) 25 mm.

(3) Surface Regularity :

The maximum permitted number of surface irregularities shall be as given below:

Irregularity	4 mm		7 mm	
Length (m)	300	75	300	75
Number of irregularities.	50	25	6	3

(4) Density of Compaction :

The density of compaction should be minimum 97 per cent of standard proctor compaction density i.e. Maximum Dry Density (MDD). Where in situ – soil is used density of compaction should be 100 per cent of standard proctor compaction density.

(5) Quality Control Test. :

The Quality Control test would basically consist of testing the density of compaction. The frequency of test will be 1 test per 2000 m² are comprising 6 measurements.

5. Embankment (Core) / Sub Grade:

A. Methodology :

1. Obtain materials (Soil) for embankment from approved sources, (sand contain 65%, i.e. 35% soil should be passed through 75 mm micron sieve, CBR should be 7).
2. After clearing the site, mark the limits of embankment by fixing batter pegs on both sides at regular intervals as guides.
3. Remove stagnant water, if any from the foundation of the embankment.
4. Where available embankment materials (Soil) are not conducive to plant growth top soil from area of cutting and areas to be covered by foundation embankment should be stripped depth not exceeding 150 mm and stacked for later use.
5. Where necessary, the original ground should be leveled to facilitate placement of first layer of embankment and compacted to achieve a field density not less than 97 percent of standard Proctor compaction density. It is necessary to further ensure that the top 500 mm of the embankment constituting the sub grade should be compacted to 100 per cent standard proctor compaction density.
6. The soil should be spread in layer not exceeding 150 mm compacted thickness Each layer should be thoroughly compacted to the specified requirements and finished parallel to the final cross section of the embankment .
7. Compaction should be O.M.C. (9-15 %). if water is required to be added , it should be added uniformly and mixed thoroughly . If the soil is too wet, it to be dried by aeration and exposure to sun till the M.C. is acceptable for compaction.
8. Maintain Camber / Cross Road 1 in 40 or 2.5% to drain of the rain water.

B. Quality Control requirements :

1. Materials :

(a) The material used in embankment, sub grade shoulders, etc shall be soil moorum, gravel, a mixture of these or other approved materials. It shall be free of logs, stumps, roots, rubbish etc.

The following types of materials shall be considered unsuitable:-

- (i) Material from swamps, marshes and bogs,

- (ii) Peat. Log stump and perishable materials.
- (iii) Materials susceptible to spontaneous combustion
- (iv) Materials are a frozen condition.
- (v) Clay having liquid limit exceeding 70 and plasticity index exceeding 45
- (vi) Materials with salt resulting in leaching action.
- (vii) Expansive clay with free swelling index exceeding 50 per cent
- (viii) Materials with a soluble sulphate content exceeding 0.5 percent by mass.

(b) The Size of coarse material shall not ordinarily exceed 75 mm when placed in embankment and 50 mm when placed in sub grade.

(c) The materials should satisfy the density requirement given below:

Density of requirement of embankments / sub grade materials

Type of work		Laboratory Dry unit weight.
1	Embankment	Not less than 1.52 gm. / c.c.
2	Sub grade	Not less than 1.65 gm/ c.c.

2. Horaizontal Alignment:

The Alignment will be reckoned with respect to the centre line of the carriageway as shown on the drawings, The edges of the roadway as constructed shall be correct within a tolerance limit of (+,-) 30 min there from.

3. Surface:

The tolerance in surface level for sub grade will be (+,-) 25 mm.

4. Surface Regularity:

The maximum permitted number of surface irregularities shall be given as below:

Irregularity	4 mm		7 mm	
Length (m)	300	75	300	75
Number of irregularities.	50	25	6	3

5. Density of Compaction:

The density of compaction should satisfy the requirement given below:-

	Type of Work / material	Relative compaction
1.	Embankment	Not less than 97 % standard proctor.
2	Sub-grade and earth shoulders	Not less than 100 % Standard proctor

6. Quality Control Test:

The quality control tests and their frequency for earthwork in embankment / sub-grade would be as per given below:

	Test	Frequency
(A)	Borrow Area	
	(i) Sand Content	1 test per 4000 cum
	(ii) Plasticity Index (Attreberg limits)	1 test per 4000 cum
	(iii) Compaction	1 test per 4000 cum
	(iv) Natural moisture content	1 test per 5000 cum
	(v) CBR	1 test per 5000 cum

(B)	Construction operation	
	(i) Moisture content prior to compaction.	1 test /250 cum/Min 4 tests per day
	(ii) Thickness of layer.	regularly.
	(iii) Density of compaction.	2 set of tests per 2000 sqm.
		Comprising 6 measurement s.

2.0 DESCRIPTION:

QA/QC procedure and equipment requirement for Road Work of WBM Grade-2 & Grade-3, Prime Coat, Tack Coat, Carpeting and Seal Coat and Road Crossing of IT / Telephone Cable.

Job procedure and quality control (as per Quality Assurance Handbook for Rural roads Vol. 1 of National Rural roads Development Agency)

(1) WATER BOUND MACADAM SUB-BASE/BASE/SURFACING (Sl. No. 405)

A Methodology

1. The surface to receive the WBM course should be prepared to the lines, grade and cross fall. It should be made free of dust and extraneous material. Large irregularities, where predominant, should be made good by providing profile corrective course.
2. Where the WBM is laid over a fine grained soil subgrade, it is advisable to lay a 100 mm thick intervening layer of screenings or coarse sand.
3. Any existing bituminous surface over which WBM is to be laid shall be completely removed before laying WBM layer.
4. The coarse aggregate should meet the physical and grading requirements laid down in Table 405.1 and Table 405.2. Coarse aggregate can be crushed or broken stone, crushed slag, over burnt brick aggregate, kankar, laterite meeting the prescribed requirements.

5. The spreading of coarse aggregate shall be done from stockpiles along the side of the roadway or directly from vehicles. In no case the aggregate shall be dumped in heaps directly on the surface prepared to receive the aggregates nor shall hauling over uncompacted or partially compacted base be permitted.

6. The coarse aggregate shall be spread uniformly on the prepared sub-grade, sub-base or base, as the case may be, to proper profile (by using templates placed across at 6.0 m intervals) in such quantities that would give the required compacted thickness. The thickness of compacted layer should be 100 mm for Grading 1 and 75 mm for Grading 2 and 3. The appropriate quantity of aggregates is given in Table 405.4. The surface should be checked with templates and all high or low spots remedied.

7. Roll the surface with suitable road rollers till aggregates are partially compacted with sufficient void space left for application of screenings. However, where screenings are not to be applied as in the case of soft aggregates, compaction shall be continued until the aggregates are thoroughly keyed. Rolling shall proceed from inner edge to outer edge at the super-elevated portions and

from the edges towards the centre in other portions. The edge should be first compacted with roller running forward and backward.

8. Check the profile transversely and longitudinally with templates/ straight edge. Correct the irregularities by loosening the surface, adding or removing the needed amount of aggregates and re-rolling until the entire surface conforms to the specified camber/ cross fall and grade.

9. Apply screenings to completely fill the interstices maintaining a slow and uniform rate, in three or more applications. The screenings should not be damp at the time of application.

10. Do not apply screenings so fast and thick as to form cakes or ridges on the surface.

11. Continue dry rolling and brooming till no more screenings can be forced into the voids of coarse aggregates.

12. Sprinkle water on the surface taking care that the underlying layer is not damaged.

13. Sprinkling, sweeping and rolling should continue till aggregates are thoroughly keyed, well bonded and firmly set in its full depth and a grout has been formed of screenings.

14. In case the screenings are not of crushable type such as moorum or gravel, it is necessary to add binding material (PI between 4 and 6) after application of screenings. The binding material should be applied in two or more layers at a slow and uniform rate. Generally, the quantity required for 10 m² of 75 mm thickness of WBM is 0.06 to 0.09 m³ and for 100 mm thickness, the corresponding quantity would be 0.08 to 0.10 m³.

In case WBM surface is not to be covered with Bituminous surfacing, PI of binding material shall be between 4 and 10.

15. The process of water sprinkling, sweeping and rolling should continue till the resulting slurry forms a wave ahead of roller.

16. The compacted WBM course should be allowed to completely dry and set before the next pavement course is laid or traffic is allowed.

17. The earthen shoulders should be constructed simultaneously with the WBM construction in accordance with Sub-Section 407.

18. The finished surface of WBM should conform to the prescribed tolerances given in Para B. Where the surface irregularity exceeds the tolerances, the WBM layer should be scarified to its full depth over the affected area and corrected by adding or removing and replacing with fresh material.

B Quality Control Requirements

1. Materials

(i) Coarse Aggregate

(a) Physical requirements

Physical requirements of coarse aggregate for water bound macadam for sub-base, base and surfacing should conform to the requirements given in Table 405.1. If the water absorption of aggregate is greater than 2 per cent, Soundness test should be carried out.

TABLE 405.1: PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FOR WBM

Test	Sub-base	Base	Surfacing
Aggregate Impact value	Less than 50	Less than 40	Less than 30
Flakiness index	Less than 30	Less than 25	Less than 20
Soundness test			
-Loss with Sodium Sulphate	Less than 12%	Less than 12%	Less than 12%
-Loss with Magnesium Sulphate	Less than 18%	Less than 18%	Less than 18%

Aggregates like brick bats, kankar, laterite etc. which get softened in presence of water shall be tested for Aggregate Impact Value under wet conditions in accordance with IS:5640.

(b) Grading:

The coarse aggregates should conform to the grading specified in the Contract and meet the requirements given in Table 405.2.

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(i) Screenings

The use of screenings shall be omitted in the case of soft aggregates like brick metal, kankar, laterite etc.

(a) Physical Requirements

Screenings should normally consist of same material as the coarse aggregate. However, where economic considerations so warrant, non-plastic material such as moorum or gravel with LL less than 20 and PI less than 6 may be used. Fraction passing 75 micron should not exceed 10 percent.

(b) Grading

The screening shall conform to the grading specified in Table 405.3.

TABLE 405.2: GRADING REQUIREMENTS OF COARSE AGGREGATE FOR WBM

Note: The compacted thickness for layer with Grading 1 shall be 100 mm while for layer with Grading 2 and 3, it shall be 75 mm.

Grading 1 shall be used for sub-base only. For base course, Grading 2 or 3 shall be used. For surfacing, Grading 3 shall be used.

Grading No. Size Range IS Sieve Designation Per cent by weight passing

1. 90 mm to 45 mm 125 mm 100

90 mm 90-100

63 mm 25-60

45 mm 0-15

22.4 mm 0-5

2. 63 mm to 45 mm 90 mm 100

63 mm 90-100

53 mm 25-75

45 mm 0-15

22.4 mm 0-5

3. 53 mm to 22.4 mm 63 mm 100

53 mm 95-100

45 mm 65-90

22.4 mm 0-10

11.2 mm 0-5

TABLE 405.3: GRADING FOR SCREENINGS

Grading Classification Size of Screenings IS Sieve Designation Per cent by weight passing the IS Sieve

A. 13.2 mm 13.2 mm 100

11.2 mm 95-100

5.6 mm 15-35

180 micron 0-10

B. 11.2 mm 11.2 mm 100

5.6 mm 90-100

180 micron 15-35

Approximate quantities of coarse aggregate and screenings required for 100 mm compacted thickness of WBM Grading 1, and 75 mm compacted thickness of WBM Grading 2 and 3 are given in Table 405.4.

(iii) Binding Material

Application of binding material may not be necessary when the screenings used are of crushable type. Binding material if used as a filler material shall comprise of a suitable material approved by the Engineer having a Plasticity Index (PI) of value less than 6 for sub-base/base course and 4 –10 for surfacing course as determined in accordance with IS:2720 (Part 5). The quantity of binding material will depend upon the type of screenings. For estimation of quantities, the following may be adopted: 75 Quantity for 75 mm compacted thickness WBM = $0.06 - 0.09 \text{ m}^3 / 10 \text{ m}^2$.

Quantity for 100 mm compacted thickness WBM = $0.08 - 0.10 \text{ m}^3 / 10 \text{ m}^2$.

2. Horizontal Alignment

The edges of the WBM sub-base/ base will be correct within a tolerance limit of (\pm) 30 mm in plain and rolling terrain and (\pm) 50 mm in hilly terrain. The edge of carriageway with WBM surfacing shall be correct within a tolerance limit of (\pm) 20 mm in plain and rolling terrain and (\pm) 30 mm in hilly terrain.

3. Surface Level

The tolerance in surface levels of the WBM would be as under:

(a) Sub-base course (+) 10 mm, (-) 20 mm

(b) Base course (\pm) 15 mm

(c) Surfacing Course (\pm) 10 mm

(A grid of 10 m by 2.5 m may be formed to check the surface levels).

TABLE 405.4: APPROXIMATE QUANTITIES OF COARSE AGGREGATE AND SCREENINGS REQUIRED FOR 100 / 75 mm COMPACTED THICKNESS OF WBM SUB - BASE / BASE / SURFACING COURSE FOR 10 m² AREA

Classification	Size Range	Compacted Thickness	Loose Quantity (Coarse Agg.)	Stone Screening	
				Grading Classification & Normal Size	Loose Quantity
Grading - 1	90 – 45 mm	100 mm	1.21 – 1.37 cum	Type - A 13.2 mm	0.27 – 0.3 cum
Grading - 2	63 – 45 mm	75 mm	0.91 – 1.07 cum	Type – B 11.2 mm	0.20 – 0.22 cum
Grading - 3	53 – 22.4 mm	75 mm	0.91 – 1.07 cum	Type – C 11.2 mm	0.18 – 0.21 cum

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4. Surface Regularity

The maximum allowable difference between the road surface and 3 m straight edge shall be as per Table 405.5.

TABLE 405.5: MAXIMUM PERMITTED UNDULATIONS MEASURED WITH 3 M STRAIGHT EDGE

Type of Construction	Maximum permissible difference
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Longitudinal Profile	Bas	Cross Profile
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WBM Grade 1	15 mm	12 mm
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WBM Grade 2/Grade 3	12 mm	8 mm
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5. Quality Control Tests

5.1 Tests Prior to Construction

The quality control tests to be carried out prior to construction are indicated in Table 405.6.

Table 405.6: QUALITY CONTROL TESTS PRIOR TO CONSTRUCTION

Type of Test	Frequency
--------------	-----------

- | | |
|--|---------------------------------------|
| 1. Aggregate Impact Value Test (IS:2386 Part 4) | One test from each identified source. |
| 2. Aggregate Water Absorption Test (IS:2386 Part 3) | -do- |
| 3. Soundness Test of Aggregates (where water -doabsorption, as at 2 above, exceeds 2%) | (IS:2386 Part 5). |

4. Grading, LL and PI of Crushable Screenings -do-
(IS:2720 Part 5) (where Screenings are to be used
from the same source as the Stone Aggregates,
this test is not needed).

5. LL and PI of the Binding Material, when used. -do-

5.2 Tests During Construction

The quality control tests to be carried out during construction are indicated in Table 405.7.

TABLE 405.7 : QUALITY CONTROL TESTS DURING CONSTRUCTION

Type of Test Frequency

1. Grading of Stone Aggregates and Screenings Atleast 2 tests to be carried out for a day's work.
(IS:2386 Part 1)
2. Flakiness Index of Stone Aggregates (IS:2386 Part 1 -do-
3. PI of Crushable Screenings/binding material Atleast 2 tests to be carried out for a day's work.
(IS:2720 Part 5)
4. Aggregate impact value (IS:2386-Part 4) At random one test per km
5. Thickness of Compacted layer. At random

5.3 Quality Control Checks by AE/EE

The quality control checks to be carried out by the AE/EE are indicated in Table 405.8.

TABLE 405.8 : QUALITY CONTROL CHECKS BY AE/EE

Stage Test Frequency Designation of

Inspecting Officer

1. Top of the (i) Volumetric analysis (a) One test for each 200 m length of the layer. AE
Finished WBM (b) One test for each 500 m length of the layer. EE Layer
(ii) Plasticity Index One test for each 500 m length of the layer AE (mean of two tests)

(iii) Surface Regularity Random Checking EE and Transverse Profile

C Do's and Don'ts

1. Check aggregates for Soundness test when water absorption is more than 2 percent.
 2. Soft aggregate should be tested for wet aggregate impact value.
 3. Construct shoulders simultaneously along with WBM layers.
 4. Use inverted choke over fine grained soil sub-grade.
 5. Remove BT surface before WBM is laid on an existing black top road.
 6. Remove defective macadam to full depth and replace by fresh material and recompact.
-
1. Do not use any material derived from rocks e.g. phyllites, shales or slates.
 2. Do not use local soil and clayey material as screenings or binding material unless it meets the requirements of PI mentioned in para B1 (iii).
 3. Do not use binding material if screenings are of crushable type.
 4. Do not spread coarse aggregate more than 3 days in advance of any subsequent operations.
 5. Do not roll if sub-grade is soft or yielding or causes a wave like motion while rolling.
 6. Do not lay WBM layer on lime treated sub-base until it has attained its strength.
 7. Do not use screenings to make up depressions.
 8. Do not allow traffic till WBM is fully set.

(2) Prime Coat

A. Methodology

- 1) On prepared surface of granular base apply prime coat with bitumen emulsion (SSI)
- 2) Spray primer at the rate of 0.90 -1.2 kg/sqm

(3) Tack Coat

A. Methodology

- 1) Providing and applying tack coat with bitumen emulsion distributor at the rate of 0.20 kg/sqm on prepared bituminous / granular surface cleaned with a mechanical broom with bitumen emulsion CSS-1h.

(4) 20 mm THICK PREMIX CARPET(sl no 508)

508.1 Open graded Premix Surfacing using Bitumen

A. Methodology

1. Prepare the base on which premix carpet is to be laid to the specified lines, grade and crosssection.
2. Apply a prime coat followed by tack coat over a granular base preparatory to laying of the carpet.
3. The quantities of material required for 20 mm thick premix carpet should be as indicated in Table 508.1.1.

TABLE 508.1.1 : QUANTITIES OF MATERIAL REQUIRED FOR 10 m² AREA

Aggregate Quantity

- (a) Nominal size 13.2 mm (passing 22.4 mm sieve and 0.18 m³ retained on 11.2 mm sieve)
- (b) Nominal size 11.2 mm (passing 13.2 mm sieve and 0.09 m³ retained on 5.6 mm sieve)

Total 0.27 m³

Binder

- (a) For 0.18 m³ of 13.2 mm nominal size stone at 52 kg 9.5 kg bitumen per m³
- (b) For 0.09 m³ of 11.2 mm nominal size stone at 56 kg 5.1 kg bitumen per m³

Total 14.6 kg

Prepare the mix in a hot mix plant of suitable size with separate dryer arrangement for aggregate.

4. Mixing should be thorough to ensure that a homogenous mixture is obtained. The temperature of bitumen at the time of mixing should be in the range of 1500 C to 1630 C and that of aggregates 1550C to 1630C, provided that the difference between the temperature of aggregate and the binder should not exceed 140C. If modified bitumen is used, temperature should be as recommended in Subsection 512. The temperature at the time of discharge of the mixture should be between 130°C and 160°C.
5. Locate hot mix plant near the work site. The mixed material should be transported quickly to the site of work and laid uniformly by suitable means.
6. The premixed material shall be spread on the road surface with Pavers.
7. Commence rolling with 80-100 kN rollers (three-wheel or tandem type), beginning from the edge

and progressing towards the centre longitudinally. (On superelevated portions, rolling should progress from lower to upper edge parallel to centre line of pavement). Continue rolling operations till a smooth uniform surface is achieved and all roller marks are eliminated. Each pass should have an overlap of at least one-third of the track made in the preceding pass.

8. Correct any high spots or depressions noticed after the roller has passed over the whole area once by removing or adding premixed material and recompact.

9. Provide a seal coat to the surface immediately after laying the carpet as per details in Sub-section 510.

10. Ordinarily, the road may be opened to traffic after laying the seal coat with restrictions given in Subsection 510.

B. Quality Control Requirements

1. Materials

(a) Aggregates

Aggregates shall conform to the physical requirements indicated in Table 508.1.2

TABLE 508.1.2 PHYSICAL REQUIREMENTS OF STONE AGGREGATE

(b) Binder

The binder shall be a penetration grade bitumen of a suitable grade S-65/90 depending on climatic condition of the area or of the type as specified in the Contract. Where modified binder is specified Subsection 512 should be followed.

2. Horizontal Alignment

The edges of the carriageway with Premix Carpet should be correct within a tolerance limit of (\pm) 20 mm in plain and rolling terrain and (\pm) 30 mm in hilly terrain.

3. Surface Level

The tolerance in surface level of the surface dressing would be (\pm) 6 mm for machine laid work and (\pm) 10 mm for work executed manually.

4. Surface Regularity

The maximum allowable difference between the pavement course and a 3 m straight edge shall not exceed 8 mm for both the longitudinal profile and the cross profile.

5. Quality Control Tests

5.1 Tests Prior to Construction

The quality control tests to be carried out prior to construction are indicated in Table 508.1.3.

Property Test Specification

Particle shape Flakiness index (IS:2386 Part 1) Max. 25 %

Strength Aggregate Impact Value (IS:2386 Part 4) Max. 30 %

Durability Soundness (IS:2386 Part 5)

Sodium sulphate Max. 12 %

Magnesium sulphate Max. 18 %

Water absorption Water Absorption (IS:2386 Part 3) Max. 1 %

Stripping Coating and stripping of bitumen aggregate Minimum retained mixture. (IS:6241) coating 95 %

(b) Binder

The binder shall be a penetration grade bitumen of a suitable grade S-65/90 depending on climatic condition of the area or of the type as specified in the Contract. Where modified binder is specified Subsection 512 should be followed.

2. Horizontal Alignment

The edges of the carriageway with Premix Carpet should be correct within a tolerance limit of (\pm) 20 mm in plain and rolling terrain and (\pm) 30 mm in hilly terrain.

3. Surface Level

The tolerance in surface level of the surface dressing would be (\pm) 6 mm for machine laid work and (\pm) 10 mm for work executed manually.

4. Surface Regularity

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5. Quality Control Tests

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Property Test Specification

Particle shape Flakiness index (IS:2386 Part 1) Max. 25 %

Strength Aggregate Impact Value (IS:2386 Part 4) Max. 30 %

Durability Soundness (IS:2386 Part 5)

Sodium sulphate Max. 12 %

Magnesium sulphate Max. 18 %

Water absorption Water Absorption (IS:2386 Part 3) Max. 1 %

Stripping Coating and stripping of bitumen aggregate Minimum retained mixture. (IS:6241) coating 95 %

5.2 Tests During Construction

The quality control tests to be carried out during construction are indicated in Table 508.1.4.

Table 508.1.3: QUALITY CONTROL TESTS PRIOR TO CONSTRUCTION

Type of Test Frequency

1. Quality of Binder (Straight-run Bitumen)

(a) Penetration Test (IS:73) One set of tests per lot

(b) R&B Softening Point Test (IS:73) -do-

(c) Ductility Test (IS:73) -do-

2. Quality of Binder (Bitumen Emulsion)

(a) Viscosity (IS:8887) -do-

(b) Residue on 600 micron sieve (IS:8887) -do-

(c) Storage Stability Test (IS:8887) -do-

3. Quality of Binder (Modified Bitumen) (IS 15462)

(a) Penetration Test -do-

(b) Softening Point Test -do-

(c) Elastic Recovery Test -do-

(d) Separation Test -do-

4. Aggregate Impact Value Test (IS:2386 Part 4) One test per km length on representative sample from each source identified by the Contractor

5. Flakiness Index Test (IS:2386 Part 1) -do-

6. Bitumen Stripping of Aggregate Test (IS:6241) -do-

7. Water Absorption (IS:2386 Part 3) -do-

TABLE 508.1.4: QUALITY CONTROL TESTS DURING CONSTRUCTION

Type of Test Frequency

1. Grading of Aggregates (IS:2386 Part 1) At least two tests per day
2. Binder Content before seal coat At least two tests per day
3. Temperature of Binder Regular close intervals
4. Thickness of layer Regularly at close intervals
5. Aggregate impact value (IS:2386-Part 4) At random one test per km

5.3 Quality Control Checks by AE/EE

The quality checks to be exercised by AE/EE are indicated in Table 508.1.5.

TABLE 508.1.5: QUALITY CONTROL CHECKS BY AE/EE

Stage Test Frequency Designation of

Inspecting Officer

1. Finished Pre Mix (i) Binder Content before providing seal One test for every 500 m AE

Carpet Surfacing coat length of the layer

(ii) Visual inspection of finished surface Full length EE

(iii) Surface Regularity and Random Checking AE

Transverse profile

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C. Do's and Don'ts

1. Ensure that aggregates for premix carpet and seal coat conform to the prescribed physical and grading requirements and are clean and dry.
2. Exercise strict control over mixing and laying temperature as per specifications using appropriate thermometers.
3. Rolling operations should be completed before the temperature of the mix falls below 100oC.
1. Do not allow manual mixing.
2. Do not undertake the work in foggy, rainy or windy weather or when the atmospheric temperature in the shade is less than 10oC or when the surface is wet.
3. Do not allow the premix material to adhere to the roller wheels. Do not use excess water for the purpose. Light sprinkling should do.
4. Do not allow the roller to stand on newly laid material.
5. Do not allow any traffic without laying seal coat over the premix carpet.

(5) SEAL COAT

The seal coat shall be any of the three types mentioned below:

Type A : Liquid seal coat comprising of an application of layer of bituminous binder followed by a cover of stone chips.

A. Methodology

Apply seal coat immediately after laying the premix carpet. The surface should be clean and free of dust and extraneous material before application of the seal coat.

1. Type A Seal coat with bitumen:

- (i) Apply heated bitumen with a temperature between 150oC and 163oC uniformly with the help of a bitumen sprayer.

(ii) Immediately thereafter, spread stone chips over the bitumen layer at a uniform rate, preferably, with the help of a mechanical grit spreader so as to cover the surface completely.

(iii) Commence rolling with 80-100 kN rollers (3-wheel or tandem type), beginning from the edge and progressing towards the centre longitudinally. On super elevated portions, rolling should progress from lower to upper edge parallel to centre line of pavement. If required, spread additional chips by hand to make up irregularities. Continue rolling operations until all aggregate particles are firmly embedded and present a uniform closed surface.

B. Quality Control Requirements

1. Materials

(a) Aggregates

Aggregate shall conform to the physical requirements indicated in Table 508.1.2. Quantities and grading requirements for aggregates are given in Table 510.1.

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(b) Binder

The requirements of Sub-section 508.1 and 508.2 shall apply. The quantities required for seal coat are given in Table 510.2.

TABLE 510.1: QUANTITY AND GRADATION REQUIREMENT OF AGGREGATE FOR SEAL COAT

Type of seal coat	Quantity of aggregate	Gradation requirement
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Required per 10 sqm area		
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100% passing sieve 100% retained sieve designation.		
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Type A	0.09 cum	11.2 mm 2.36 mm
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Type B	0.06 cum	2.36 mm 180 microns
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Type C	0.09 cum	9.5 mm 2.36 mm
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TABLE 510.2: QUANTITIES OF BINDER REQUIRED FOR SEAL COAT

Type of seal coat Per 10 sqm area

Bitumen in kg Bituminous Emulsion in kg

Type A 9.8 12 to 14

2. Quality Control Tests

The quality control tests and their frequencies would be as per Tables 507.5, 507.6, 507.7 for Type

A Seal Coat and 508.1.3, 508.1.4

C. Do's and Don'ts

1. Use angular fragments of clean, hard, tough and durable rock of uniform quality throughout as an aggregate for seal coat.
 2. Ensure that Stone chippings conform to the specified size and are dry and clean at the time of mixing.
 3. Ensure that the seal coat results in a smooth, uniform and closed surface.
 4. Maintain requisite temperature control at the time of mixing and rolling if bitumen is used as a binder
1. Do not use soft or disintegrated stone, organic or other deleterious material as an aggregate for seal coat.
 2. Do not undertake the work in foggy, rainy or windy weather or when the atmospheric temperature in the shade is less than 10°C.
 3. Do not allow the premix material to adhere to the roller wheels. Use light sprinkling of water for this purpose. Do not use lubricating oil on the wheels of the roller to prevent mix from adhering.
 4. Do not allow traffic on Type A seal coat till the following day.

DETERMINATION OF TEMPERATURE OF BINDER

The temperature of bituminous binder shall be determined with the help of a calibrated metallic contact thermometer with digital (LCD/LED) display. The range of thermometer for different types of bituminous material and their accuracy shall be as under:

- (1) Melted Bitumen : ambient to 200°C accuracy + 1°C
- (2) Cutback bitumen : ambient to 100°C accuracy + 0.5°C
- (3) Bitumen emulsion : ambient to 80°C accuracy + 0.5°C

ANNEX- II

RATE OF SPREAD OF BINDER IN SURFACE DRESSING

AND MODIFIED PENETRATION MACADAM

Light metal trays of 200 mm x 200 mm and 30 mm depth are weighed and numbered. These are placed at intervals along the road in the path of bitumen distributor between the wheel tracks. After the distributor has passed over, the trays are removed and wrapped in weight sheets of paper so that they can be handed, stocked and weighed as soon as convenient. The spacing and the number of trays can be varied to suit the particular conditions at the construction site, but at least five trays should normally be used. The tray test gives a measure of variation in rate of spread of bitumen along the road and a good approximation to the average rate of spread of bitumen.

The trays are weighted correct to first place of decimal. The maximum longitudinal distribution error in rate of spread of bitumen should be within +10 per cent of the specified rate of spread of bitumen. Similarly transverse distribution of bitumen can be checked by placing a number of trays to collect bitumen sprayed over each 50 mm width of spray bar. The variation in transverse distribution should be within + 20 per cent from the mean. The extreme 150 mm width at either side of the sprayed area need not be taken into account.

ANNEX- III

DETERMINATION OF IN-SITU DENSITY OF BITUMINOUS COURSE

The metallic tray of the field density is kept on a level spot of the bituminous surface and a hole, 100 mm in diameter, is cut up to the full thickness of the layer. All bituminous materials removed from the hole are carefully collected and weighed. The thickness of the layer is also recorded. A known weight of dry standard sand passing 600 micron sieve and retained on 300 micron sieve, is taken in the sand-pouring cylinder. The cylinder is kept directly over the hole, and the shutter of the cylinder is released without any jerk and closed when the hole is filled with the sand. The quantity of the residual sand in the cylinder as well as the quantity filling the cone of the cylinder are separately weighed.

The In-situ density of the layer is calculated as follows:

$$\text{In-situ density} = (A \cdot D) / (W - (W_1 + W_2)) \text{ g/cc}$$

Where,

A = Weight of bituminous materials removed from the hole cut in the layer, g

W = Initial weight of sand taken in the cylinder, g

W1 = weight of sand filling the cone of the cylinder, g

W2 = weight of sand remaining in the cylinder, g

D = bulk density of sand, g/cc

Prior calibration for depth of hole, in necessary.

ANNEX- IV

D. RATE OF SPREAD OF AGGREGATE IN SURFACE DRESSING

The rate of spread of aggregate by the aggregate spreader or any other suitable means can be checked by measuring the area covered by each lorry/truck/any other device of known capacity. This can also be checked by removing the spread aggregate from small areas of the road surface and weighing them. A 200 mm square metal frame is laid on the new surface dressing, and all the aggregate within the enclosed area are collected, washed in solvent to remove bitumen and then weighed, and the rate of spread of aggregate is calculated. It is measured along the road at intervals of between 4 m to 8 m. The variation in the rate of spread of aggregate should be within + 20 per cent of the mean.

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ANNEX- V

DETERMINATION OF BITUMEN CONTENT IN BITUMINOUS MIX

The test is intended for determination of bitumen content in the bituminous mix by cold solvent extraction

method. The mineral aggregate recovered from the test can be used for checking their gradation. A representative bituminous mix sample of about 500 g by weight is accurately weighted and placed in the bowl of extraction apparatus and covered with commercial grade of trichloroethylene. Sufficient time (not more than one hour) is allowed for dissolving the bitumen in solvent. The filter ring of the extractor is dried, weighed and then fitted around the edge of the bowl. The cover of the bowl is clamped tightly. A beaker is placed under the drain to collect the extract. The machine is revolved slowly and then gradually the speed is increased to a maximum of 3600 rpm. The speed is maintained till the solvent ceases to flow from the drain. The machine is allowed to stop, 200 ml of solvent is added and the above procedure is repeated. A number of 200 ml solvent additions (not less than three) are used till the extract is clear and not darker than light straw colour. The filter ring from the bowl is

removed, dried first in air and then in oven at 115oC to constant weight, and weighed. The fine materials that might have passed through the filter paper are collected back from the extract preferably by centrifuging. The material is washed and dried to constant weight as before. The percentage of binder in the bituminous mix is calculated as follows:

$$W1 - (W2 + W3 + W4)$$

$$\text{Percentage of Binder} = \frac{\quad}{\quad} \times 100$$

W1

W1 = weight of sample, g

W2 = weight of sample after extraction, g

W3 = weight of fine material recovered from the extract, g

W4 = increase in weight of filter ring, g

4. SECTION 500: BITUMINOUS CONSTRUCTION

4.1 Prime Coat

1. Material

Check that Slow Setting bituminous emulsion with required viscosity and quantity as per Table 502.1 has been used and that where bituminous cutback has been used, it is only in situations of sub-zero temperatures or in emergency applications.

2. Application of Bituminous Primer

- (i) Check if the surface to be primed has been properly prepared.
- (ii) Check that only self-propelled or towed sprayer is used and that spraying with the use of a perforated canister has not been resorted to.
- (iii) Check if the rate of spray of primer has been checked by a tray test at least twice a day.
- (iv) Check if the sprayed primer is cured for atleast 24 hours before opening to traffic.

4.2 Tack Coat

1. Material

- (i) Check, if the type of binder used for tack coat is a bituminous emulsion of RS-1 grade and not a straight-run bitumen.

(ii) Check, if a bituminous cutback is used, it is only in areas of sub-zero temperature or in emergency applications.

(iii) Check that the rate of application of bituminous emulsion has been selected on the basis of the type of receiving surface as per MORD Specifications.

2. Application of Binder

(i) Check, if the surface receiving the tack coat has been properly prepared.

(ii) Check that only self-propelled or towed sprayer is used and that spraying with the use of a perforated canister has not been resorted to.

(iii) Check, if the rate of spray of binder has been checked by a tray test, atleast twice a day.

(iv) Check that the tack coat has been left to cure until all volatiles have evaporated and that no traffic is allowed to ply on the tack coat.

4.3 Bituminous Wearing Course-Surface Dressing

1. Aggregate

(i) Check, if the size of aggregate in use is appropriate to the surface on which it is being laid and the anticipated traffic on the road.

(ii) Check, visually, if the flaky aggregates do not exceed the permissible limit.

(iii) Check the aggregate for gradation (atleast one test per km length) to see if it meets the specified requirements.

(iv) Check, that the aggregates are not undergoing any amount of crushing.

(v) Check, if the 'Average Least Dimension' of the aggregate has been determined scientifically and rate of spread of aggregate is according to the Design Chart.

(vi) Where pre-coated stone chips are used, check if the mixing of stone chips and paving bitumen was carried out in a suitable mixer and that the stone chips and bitumen were heated to the specified temperatures.

(vii) Check if the pre-coated chips were allowed to cure for atleast one week or until they become non-sticky, before spreading.

2. Bitumen

(i) Check, if the bitumen is of specified penetration/ viscosity grade and is heated to the required temperature, using a calibrated thermometer.

(ii) Check, if the surface receiving the surface dressing has been properly prepared and where required, properly primed.

3. Rate of Spread of Aggregate

Check the rate of spread of aggregate as explained earlier.

4. Rate of Spread of Binder

(i) Check, if the rate of spray of bituminous binder has been scientifically determined by using the design chart (considering the climate, the type of receiving surface and type of materials used etc.) and that a tray test is being used to determine the actual rate of spray of bitumen in the field.

(ii) Check if spraying of bituminous binder was carried out by a Pressure Distributor or at least by hand held lance sprayer at proper temperature.

5. Checking Completed Surface

For completed surface dressing, check:-

(i) If the size of aggregate used is appropriate to the type of receiving surface and the anticipated traffic.

(ii) If the proportion of flaky and elongated aggregates is not more than the permissible limits.

(iii) If there is any ravelling/ loss of aggregate/ streaking.

(iv) If the edges of surface dressing are within a tolerance limit of ± 20 mm in plain and rolling terrain and ± 30 mm in hilly terrain.

(v) If the surface regularity was measured with a 3 m Straight Edge.

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4.4 Bituminous Wearing Course : Premix Carpet/Mix Seal Surfacing

1. Aggregate

(i) Check for the gradation of aggregate at the hot mix plant; also visually check if the proportion of flaky and elongated aggregates is within specified limits.

(ii) Check the temperatures of heated aggregate, heated binder and the mix at the hot mix plant to be within the specified limits, using appropriate thermometers.

(iii) Check the temperature of the mix at the time of laying the mix.

2. Equipment

Check that the hot mix plant used for the preparation of premix has a separate dryer arrangement for aggregate and is of appropriate capacity and type.

3. Checking Completed Project

For completed projects, check:-

- (i) The thickness of layer by making test pits at random.
- (ii) The binder content from test results.
- (iii) The edges to be within ± 20 mm in plain and rolling terrain and ± 30 mm in hilly terrain.
- (iv) Surface regularity at random, using a 3 m straight edge.
- (v) The types of visible surface defects, if any.

**LIST OF OWN EQUIPMENTS / MACHINERIES TO BE DEPLOYED BY THE CONTRACTOR
FOR ROAD CONSTRUCTION WORKS**

1. Compaction : 80-100 kN smooth-wheeled Roller
2. Applying Prime Coat : Hand-held lance with sprayer operated by compressor
3. Heating Bitumen : Bitumen Boiler of small capacity
4. Applying Binder : Hand-held lance with sprayer, operated by Compressor
5. Mixing of aggregates and bitumen in : Hot Mix Plant, capacity with specified quantities of around 75 tonnes/hour.
6. Transporting from the Hot Mix Plant to site : Dumper or miller
7. Spreading of Premix material : Mechanical Pavers.

PART C

TECHNICAL SPECIFICATIONS FOR CIVIL AND PLUMBING WORK

1.0 SPECIFICATIONS

GENERAL

Unless otherwise specified, Technical Specifications of Works shall generally conform to the relevant APWD Specifications of latest edition including amendments thereafter. In absence of any detailed specifications, work shall be carried out as per relevant Indian Standard Specifications or Code of Practice. Wherever the codes and specifications are silent then the same shall be governed by sound engineering practices and the decision of the Engineer-in-Charge / Consultant in matters of interpretation etc., shall be final and binding on the Contractor. The Contractor shall carefully acquaint himself with these specifications to determine his contractual obligations for the work. The conditions of these specifications will be binding on the Contractor and no deviation shall be permissible unless specifically approved by the Engineer - in - Charge in writing. The work under this tender shall be executed strictly in accordance with the constructional and material requirements defined under these specifications. However brief specifications are given hereunder for general guidance purpose of the tenderers. It shall clearly be noted that the bidders are required to give their item rates taking into consideration all aspects as per site requirements and drawings/specifications enclosed along with this tender document. Quoted offers shall be inclusive of all materials and labour cost .Water and Power shall have to be arranged by the contractor for execution of the tendered work. The contractor shall be responsible to complete the entire work in all respects and any other works necessary to complete the job though especially not covered in the scope of work.

DRAWINGS/DIMENSIONS

Figured dimensions on drawings shall supersede measurements by scale and drawings to a large scale take precedence over those to a smaller scale. Special dimensions in the specifications shall be checked on site. The dimensions where stated do not allow for wastage, laps joints etc., the levels. Measurement and other information concerning the existing site on the drawings are believed to be correct, but the contractor shall verify them for himself and also examine the nature of the ground as no claim or allowance whatsoever shall be entertained hereinafter on account of any errors or omissions in the levels or the description of the ground turning out to be different from what was expected or shown on the drawings.

CORRELATION OF DRAWINGS

Before commencement of work, the contractor shall correlate all relevant structural, construction and services drawings and satisfy himself that the information available is complete and unambiguous. The contractor shall be responsible for any error / difficulty in execution / damage incurred owing to any discrepancy in the drawings which has been over looked by him and has not been brought to the notice of the Engineer -in - charge / Consultant before execution.

B.I.S CODES OF PRACTICE

Wherever any reference is made in the specifications to any Bureau of Indian Standard (BIS) code of practice, it shall be understood to indicate the latest version of the code of practice in usage at the time of construction.

MATERIALS

1. The materials to be used in permanent works shall be new and of the best quality. All materials shall be in accordance with Specifications and approved by the Engineer-in-Charge or his representative.
2. Except otherwise specified or permitted by the Engineer-in-Charge or his representative all materials shall conform to the relevant Indian Standard Specifications (latest edition).
3. In addition to special provisions made herein for sampling and testing of materials by particular methods, samples of all materials and proposed methodology for the execution of the works shall be submitted by the contractor for approval well in advance. The contractor shall supply the same to the testing lab, all carriages etc. shall be paid by the contractor, Samples, when approved will be retained by the Engineer's representative and for this purpose suitable labeled boxes for storage of samples shall be provided by the contractor. No material shall be supplied or used on permanent works until the samples of the same have been approved by the Engineer-in-Charge. If any material is rejected in testing the contractor shall promptly remove the rejected materials from the vicinity of the works to the satisfaction of the Engineer-in-charge.
4. Material shall be packed, transported handled and stored on the site carefully and in a satisfactory manner so as to prevent any damage and/or deterioration of any kind either during transit or storage.
5. Notwithstanding any tests that the Engineer-in-Charge or his representative may direct to be carried out at the contractor's sub -contractor's and/or manufacturer's premises, the Engineer's representative shall be at liberty to carry out any further test after delivery of the materials at the site, at the cost of the contractor and may reject any or all materials which fail to comply with the required specifications.
6. Where items are specified by trade names or manufacturer's reference, the contractor may provide alternative items, equal in quality and design, in case of non-availability of specified manufacturer, with

approval of Engineer-in-Charge. At no extra cost, provided samples of all such alternative along with a sample of the specified material have been previously submitted and approved by the Engineer-in-Charge.

7. Should the Engineer-in-Charge or his representative at any time condemn any material or goods intended for use in the works as:

- a) Being inferior to samples previously submitted
- b) Having deteriorated in transit or on storage or on the site.

OR

c) Not complying with the specifications. The contractor shall promptly remove all such materials from the vicinity of the works to the satisfaction of the Engineer-in-Charge. Should the Engineer-in-Charge discover on the works any materials other than those approved, he may order their immediate removal from the site. Any work executed with inferior materials is to be taken out and reinstated with approved material at the contractor's risk & cost.

BRIEF OUTLINE OF THE SCOPE OF WORK

The following brief outline of various items to be executed is listed out which are to be read in conjunction with the Technical specifications and drawings.

- Anti-termite treatment as per APWD specifications to be executed by reputed party (Licensed holder)
- Earth work in excavation in all kinds of soils and in all lead & lift.
- Filling with surplus excavated earth.
- Filling with selected earth brought from outside at any lead & lift.
- Providing and filling silt earth / sand under floor in foundation.
- Providing and laying plain cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone agg; 40mm nominal size) in foundation bed.
- Providing and laying M20 grade of concrete nominal mix(1:1.5:3) (1 cement: 1.5 coarse sand:3 graded stone aggregate; 40 mm nominal size.
- Providing cutting bending and placing steel reinforcement as per detail structural drawings.
- Providing and laying brick work in CM 1:4 (1 cement: 4 coarse sand) in foundation strength of the bricks should be 75 class designation.
- Providing and laying brick work in CM 1:4 (1 cement : 4 coarse sand) in superstructure strength of the bricks should be 75 class designation.

- 400mm long 50mm-dia PVC waterspouts to be connected to RW pipe.
- High Density PVC rain water/sanitary pipe with all accessories and jointing.
- Water supply in composite pipes as per drawing.
- 12 mm cement plaster of mix 1: 4 (1 cement: 4 fine sand) on fair side of brick/concrete surface.
- 6mm ceiling plaster in CM 1:3 (1 cement : 3 fine sand)
- 15mm cement plaster of mix 1:4 (1 cement: 4 fine sand) on rough side of brick wall surface.
- 18 mm thick cement plaster in two coats under layer 12 mm thick cement plaster in 1:5 (1 cement: 5 coarse sand) finished with a top layer of 6 mm thick cement plaster 1:6 (1 cement: 6 fine sand)
- Providing drip course (bulging) on all external projected slabs and chajjas.
- Two or more coats of weather coat emulsion paint and granule paint over a coat of wall putty on all exterior walls surfaces as specified in the schedule of finishes.
- Acrylic emulsion as specified in the schedule of finishes over wall putty prepared surfaces.
- Enamel paint over wood /steel surfaces over a coat of approved quality primer.
- Plinth protection with 50 mm thick of cement concrete 1:3:6(1 cement: 3 coarse sand: 6 stone aggregate; 20 mm nominal size) over 75 mm thick bed of dry bricks with 12 mm thick cement plaster in 1:5 (1 cement:5 coarse sand) finished neat cement slurry.
- Wall putty with white cement base of average thickness 1 mm.
- Water proofing treatment with bitumen felt over roof.
- Water proofing treatment to vertical and horizontal surfaces of sunken slab of W.C., kitchen etc. consists of cement slurry @4.4 KG per sqm with water proofing compound conforming to I.S.2645 and 20 mm thick cement plaster in 1:3(1 cement: 3 sand) mixed with water proofing compound of approved make.
- House drains as per drawings/specifications.
- All exposed MS members to be painted with deluxe multi-surface paint of required shade.
- All wood shall be kiln seasoned and chemically treated.
- Painting wood work with deluxe multi-surface paint of required shade.
- MS roof truss including purlin fabricated out of MS rectangular / square/tubular hollow section conforming or relevant IS code including providing MS cleats, base plates, bolts and nuts and necessary cleats etc. for fixing ceiling joists as per drawing and roofing.

- Septic Tank and Soak Pit as per drawings.
- Pre painted galvanized iron sheet roofing (PPGI) of 0.5 mm thick.
- M/F Suspended false ceiling with 12.5 mm thick Moisture Resistant Gypboard.

M/F Suspended ceiling, which includes CRP surface ribbed perimeter channels (having one flange of 20 mm and another flange of 30 mm and a web of 27 mm) along the perimeter of ceiling, screw fixed to brick wall / partition with the help of nylon sleeves and screws, at 610 mm centres. Then suspending CRP surface ribbed intermediate channels of size 45 mm (with two flanges of 15 mm each) from the soffit at 1220 mm centres with CRP surface ribbed ceiling angle of width 25 mm X 10 mm fixed to soffit with GI cleat and steel expansion fasteners. Then CRP surface ribbed ceiling section of having web of 51.5 mm and two flanges of 26 mm each with lips of 10.5 mm are then fixed to the intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457 mm centres. Single layer of 12.5 mm tapered edge Moisture Resistant Gypsum Board (conforming to BS 1230 Part 1) is then screw fixed to the ceiling section with 25 mm drywall screws at 230 mm centres. Screw fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally square and tapered edges of the boards are to be jointed and finished so as to have a flush look which includes filling and finishing with Jointing compound, Joint Paper tape and two coats of Drywall Top Coat.

- M.S. grating for storm water drain and railing for staircase with MS flat, MS square bar, etc., as per drawing.

DOORS

- UPVC door as per APWD item no. 12.13.2
- Factory made flush door shutters as per APWD item no. 9.18.1
- Timber door frame as per APWD item no. 9.1.2

WINDOWS / VENTILATORS

- UPVC windows as per APWD item no. 12.12

FLOORING & PAVING:

- Marble Work in flooring, skirting, wall etc.: Thickness of the marble should not be less than 18 mm.
- Ceramic Tile flooring as per APWD specifications.
- Granite work in kitchen platform, floor and counter top: Thickness of the granite should not be less than 18 mm. The granite is laid over 20 mm thick cement mortar in 1:4 (1 cement:4 coarse sand), joints treated with white cement mixed with matching pigment including rubbing, curving, moulding and polishing to edges to give high glossy finish.

- Kota stone flooring with white marble strips.
- Vitrified Tile flooring – anti-skid vitrified tiles.
- Pavers: Providing and laying factory made cement concrete interlocking pavers block of M30 grade made by block making machine with strong vibratory compacted bed of coarse sand.

HARDWARE AND FITTINGS

- 150mm long brass handles with CP brass screws
- 200 mm long brass tower bolt with CP brass screws
- Door stoppers
- Brass Aldrop (300X16X5) mm
- Stainless Steel butt hinge 100X75X4mm.
- All hinges shall be fixed with CP brass screws.
- All window/ventilator panels shall be provided with fixtures such as stay & handles, for open able. The thickness of glass panes shall be 4mm. All toilet glass panes to be provided with frosted glasses.

SANITARY AND PLUMBING WORKS

- European pattern W.C. and Indian Pattern W.C. with low level flushing cistern as per drawing.
- Wash basin at toilet as per drawings. Wash basins to be provided with C.I. /M.S brackets.
- Mirror as per drawing
- Providing CP soap dispenser
- Toilet paper holder
- Towel ring
- Rain water pipe (PVC) – 150mm dia with necessary fittings like bends, tees, junctions floor traps, terminal guard etc. with pipe clips and joints as per requirements
- Floor trap with CP jalli of 125 mm nominal dia in toilet, kitchen.
- PE-AL-PE pipes of required sizes for water supply network.
- PVC pipe with necessary fittings like bends, tees, junctions floor traps, terminal guard etc. with pipe clips and joints as per requirements of sanitary scheme.
- Septic Tank with Soak pit, Inspection chambers, manholes, drainage pipes etc. as per drawings.

SPECIFICATIONS FOR EXCAVATION AND EARTHWORK

1.1 SCOPE

The scope of work broadly includes but is not necessarily limited to the following i.e. clearing of the site, excavation of foundation trenches, back filling, disposal of surplus earth as required including dewatering, shoring and strutting. Contractor shall provide all tools, labour, equipment and incidentals necessary required for completion of all aspects of work covered in these specifications.

1.2 TYPES OF SOIL

Contractor shall thoroughly acquaint himself with the types of soil in excavation by an inspection of nature of the ground at site & scrutiny of the investigation details available with the Consultant.

1.3 CLEARING THE SITE

The site on which the structure is to be built shown on the drawings and the area required for setting out and other operations like road, drains, sheds, etc. should be cleared and all obstructions, loose stones, materials and rubbish of all kinds, stump, brush wood and trees removed as directed, roots being entirely grubbed up. All useful materials obtained will be the property of the Engineer-in-charge and will be handed over to the Consultant. Rejected materials will be removed by the contractor to his own dump.

1.4 GROUND LEVELS AND SITE LEVEL PLAN

Before starting the excavations, the requisite block levels of the entire plot shall be taken by the contractor in consultation with the consultant and a proper record of these levels to be kept, which shall be jointly signed by the Contractor and the Consultant. A block level plan showing all the ground levels of the plot shall be prepared and shall jointly be signed by the Contractor and the Consultant/Engineer-in-Charge.

1.5 SETTING OUT

After clearing the site, and preparing the site level plan, the Contractor will set out the center lines of the buildings or other involved works and get the same approved from the Consultant. It shall be the responsibility of the Contractor to install substantial reference marks, bench marks etc. and maintain them as long as required by the Consultant. The Contractor will assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

1.6 EXCAVATION AND PREPARATION OF FOUNDATIONS FOR CONCRETING

1.6.1 General

Foundations trenches shall be dug wet or dry to the dimensions as shown on the drawings or as directed by the Consultant. The excavated materials shall be stacked at a sufficient distance away from the edge of the excavated pit so as not to endanger the stability of the sides. The soil heap shall not exceed more than 2m from the ground.

The Contractor shall, at his expense and without any extra charge, make provision for all shoring and strutting, extra excavation in slope, extra excavation in working space, dredging or bailing out water, and the excavation shall be kept free from water when the foundation work is in progress. If the excavation is carried out to greater width, length or depth than specified, extra depth shall be made up by filling in lean concrete and extra length or width by filling in with earth rammed hard or by masonry as directed by the Consultant's. Cost of such extra excavation and the filling required therein as specified above shall be borne in full by the Contractor. If required to protect the sides of the pits and trenches, timber shoring and strutting shall be erected. The timbering shall be closed or open depending on the nature of the soil and work, and arrangement of timbering including sizes and spacing of members used shall be as approved by the Consultant. NO EXTRA CHARGES shall be admissible on this account. The bottoms of all excavation shall be trimmed and leveled in accordance with drawings / directions of the Consultant / Engineer-in-Charge. The bottoms of all excavation shall be rammed and wetted before deposition of concrete. The Contractor shall report to the Consultant / Engineer-in-Charge when the excavation is ready to receive concrete. NO concrete shall be placed in foundations until the contractor has obtained the approval of Consultant/ Engineer-in-charge.

1.6.2 PROTECTION

All foundation trenches and similar excavations shall be strong, fenced and marked with red lights at night for watchmen to avoid accidents. Adequate protective measures shall be taken to see that the excavation does not affect or damage adjoining structures. All measures required for the safety of the excavation the people working in and near the foundation trenches, property and the people in the vicinity shall be taken care by the contractor at his own cost, being entirely responsible for any injury and damage to property caused by his negligence or accident due to his construction operations.

1.6.3 STACKING OF EXCAVATED MATERIALS

Work for excavation shall include sorting out useful materials and stacking them on site as directed. Materials suitable and useful for back filling, plinth filling, leveling of the plot or other use shall be stacked convenient places, but not in such a way as to obstruct free movement of men, equipment and vehicles or encroach on the area required for constructional purposes.

1.7 BACKFILLING

1. 7.1 Earth obtained from excavation (or approved earth brought from outside for which no extra payment shall be made) shall be filled in layers as described in 1.7.3 around foundations and under floors. In case extra earth used for filling is required under floors, plinth protection including sit outs, courtyards, and the contractor will do at their own cost. The lumpsum offer shall be deemed to include the earth filling required under floors and plinth protection with plinth height shown in drawing above the bottom of the foundation concrete and finished courtyard level shown in Drawing below DPC coping level of the main building.

1.7.2 QUALITY OF FILLING

Fill shall be well compacted, well graded earth or sand and shall be free from tree stumps, organic matter, seed and peat etc. Where earth or sand from source other than excavation at site is used, the quality of such earth or sand shall be the same as that obtained from excavation at site, or superior to it. Fine sand for filling is River Sand. Black Cotton soil shall not be used for back filling or plinth filling.

1.7.3 COMPACTION

The fill shall be spread in layers not exceeding 20 cm thick and each layer shall be watered and thoroughly consolidated by suitable mechanical rollers, rammers, vibrators or other approved plant or system of compaction. The fill material shall be pulverized before depositing in place.

Optimum moisture content shall be maintained for the filled materials. Compaction shall be done so as to achieve a dry density of not less than 90% of the maximum density obtained at optimum moisture content, except for the upper 20 cm layer which shall be compacted to a density of not less than 95% of the maximum density. In order that the fill shall be reasonably uniform throughout, the material shall be dumped in place in approximately horizontal layers "Edge dumping", a process by which materials is pushed off edge of the fill and allowed to roll down the slope shall not be carried out, If there is traffic over the fill during construction, either by construction equipment or otherwise, it should be routed to make the compaction as uniform load shall be maintained and also care shall be taken to prevent any wedging action.

1.8 DE-WATERING

Work for excavation shall include bailing or pumping out water which may accumulate in the excavation during the progress of work either from subsoil, seepage, springs, rain or any other cause and diverting surface flow if any by bunds or other means. Pumping out water shall be done in such approved manner as to preclude the possibility of any damage to the foundation trenches, Concrete or masonry of any adjacent structure. When water is met with in foundation trenches, pumping out water shall be from an

auxiliary pit of adequate size dug slightly outside the building excavations. The depth of the auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilled with approved excavated materials after de-watering is over. The excavation shall be kept free from water -

- 1) When Concrete/Reinforcement Work/water Proofing work is in progress.
- 2) Till the Consultant consider that concrete / mortar is sufficiently set.

1.9 SURPLUS EXCAVATED MATERIAL

All excavated material certified as surplus and not useful, shall be removed by the Contractor from the site an approved manner at his own cost and risk so as indemnify owner from any claims any time of whatsoever nature.

1.10 CONTRACT SUM TO INCLUDE

Apart from other factors mentioned elsewhere in this contract, the contract sum shall also include for the following:

- (a) Clearing site.
- (b) Setting out works, profiles etc. as required and setting up bench marks and other reference marks.
- (c) Providing shoring and strutting and subsequently removing the same.
- (d) Bailing and pumping out water as required and directed.
- (e) Excavation at all depth (unless otherwise specified in the drawings) and removal of all materials of whatever nature wet or dry and necessary for the construction of foundation etc. and preparing bed for laying concrete.
- (f) Sorting out useful excavated materials, transporting them beyond the structure and stacking them neatly on the site for back filling or reuse as directed.
- (g) Back filling the trenches alongside masonry or concrete with approved excavated material up to the natural ground level including watering and ramming.
- (h) Necessary protection (including labour, materials and equipment) to ensure safety against risk of accident.
- (i) Drilling small holes as directed to explore the nature of substratum if necessary (j) Excavation if soft rock / hard rock if necessary.

2. SPECIFICATIONS FOR ANTITERMITE TREATMENT

2.1 GENERAL

Prevention of termite from reaching the super structure can be achieved by creating a chemical barrier between the ground and the building by treating the soil beneath and around the foundations. The work shall be carried out as per IS 6313 part II of 2001 or latest edition. This shall be provided to sides and bottom of trenches and footing including treating the backfill of foundations up to ground level and the vertical surface of wall, and filling of each under floors and treating the surface at ground level 900mm around the building.

2.2 MATERIAL

Anti termite treatment, shall be carried out strictly in accordance with Assam PWD specifications using Chloropyrifos (CPP) an Emulsified concentrate @ 1% concentration or any other approved chemical.

2.3 PRE-CONSTRUCTION CHEMICAL TREATMENT

This is a process in which chemical treatment is applied to a building in the early stage of its construction at the rate specified in IS 6313 part II of 2001 or the latest edition. Hand operated pressure pump shall be used for uniform spraying of the chemical. To have proper check for uniform spraying of chemical graduated containers shall be used. Proper check should be kept that specified quantity of chemical is used for the required areas during the operation.

2.4 TIME OF APPLICATION

Soil treatment shall start when foundation trenches and pits are ready to take lean concrete in foundations. Laying of lean concrete shall start when chemical emulsion has been absorbed by the soil and the surface is quite dry. Treatment should not be carried out when it is raining or the soil is wet with rain or sub soil water. The foregoing applies also in the case of treatment to the filled earth surface within the plinth before laying the sub grade for the floor.

2.5 DISTURBANCE

The treated soil barriers shall not be disturbed after they are formed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.

2.6 TREATMENT OF COLUMNPITS AND WALL TRENCHES:

(a) The bottom surface and the sides (up to a height of above 300mm) of the excavation made for column pits and trenches shall be treated with the chemical at the rate specified in IS 6313 part II of 2001 or the latest edition.

(b) After the column foundation and the wall foundation come up, the back fill in immediate contact with the foundation structure shall be treated at the rate specified in IS 6313 parts of 2001 or latest edition of the vertical surface of the substructure for each side. If water is used for ramming the earth fill, the chemical treatment shall be carried out after ramming operation is done by prodding the earth at 150mm centers close to the wall surface and spraying the chemical with the above dose. The earth is usually returned in layers and the treatment shall be carried out in similar stages. The chemical emulsion shall be directed towards the concrete to masonry surface of the columns and walls so that the earth in contact with these surfaces is well treated with the chemical.

(c) In the case of R.C.C framed structure with columns and plinth beams and R.C.C basement with concrete, mix is rich and dense (being 1:2:4 or richer), it is unnecessary to start treatment from bottom of excavation for columns and plinth beams. The treatment shall start at the depth of 500 mm below ground level. From this depth the back fill around the column, beams and R.C.C basement wall shall be treated at the rate as per IS 6313 part II of 2001 or the latest edition. The other details of treatment shall be as laid down in the clause (b) above.

2.7 TREATMENT OF TOP SURFACE OF PLINTH FILLING

The top surface of the filled earth within plinth wall shall be treated with chemical emulsion at the rate as per IS 6313 part II of 2001 or latest direction (surface area) before the sand/sub-grade is laid. Holes up to 50 to 70 mm deep at 150mm centers both ways shall be made with crow bars on the surface of the soil with chemical emulsion.

2.8 TREATMENT OF JUNCTIONS OF WALL AND FLOOR

To achieve continuity of the vertical chemical barrier on inner wall surface from the ground level, small channel 30 x 30 mm shall be made at all junctions of wall and columns with the floor (before laying the sub-grade) and rod holes made in the channel up to ground level 150mm apart and the chemical emulsion poured along the channel as per rate of application, mentioned in IS 6313 Part II of 2001 or the latest edition so as to soak the soil right up to bottom. The soil shall be tamped back into place after this operation.

2.9 TREATMENT OF SOIL ALONG EXTERNAL PERIMETER OF BUILDING

During progress of work, provide hole in the soil with iron rods along the external perimeter of the building at intervals about 150 mm and depth 300 mm and filling these holes with chemical emulsion at the rate (as per IS 6313 part II of 2001 or the latest edition) per meter of perimeter of the external wall.

2.10 TREATMENT FOR EXPANSION JOINTS

Anti termite treatment shall be supplemented by treating through expansion joints after the sub grade has been laid as per IS 6313 part II of 2001 or the latest edition.

2.11 TREATMENT OF SOIL SURROUNDING PIPE AND CONDUITS

When pipes and conduits enter the soil inside the area of the foundations, the soil surrounding the points of entry shall be loosened around each such pipe or conduit for a distance of 150 mm and up to depth of 75 mm before treatment is commenced. When they enter the soil external to the foundations, they shall be similarly treated unless they stand clear of the walls of the building by about 75 mm for distance of over 300 mm from ground level.

2.12 SAFETY PRECAUTIONS

All chemicals used for anti termite are poisonous and hazardous to health. These chemicals can have an adverse effect upon health when absorbed through skin, inhaled as vapors or spray mists or swallowed. Person using or handling these chemicals should be warned of these dangers and advised that absorption through the skin is the most likely source of accidental poisoning. They should be cautioned to observe carefully the safety precautions given below: These chemicals are usually brought to site in the form of emulsifiable concentrates. The containers should be clearly labeled and should be stored carefully so that children and pets cannot get at them. They should be kept securely closed. Special care should be taken to prevent skin contact with concentrates. Prolonged exposure to dilute emulsions should be avoided. Workers should wear clean clothing and should wash thoroughly with soap and water, especially before eating or smoking. In the event of severe contamination, clothing should be removed at once and skin washed with soap and water, if chemicals splash into the eyes they should be flushed with plenty of fresh water and immediate medical attention should be sought. The concentrates are oil solutions and present a fire hazard owing to the use of petroleum solvents. Flames should not be allowed nearby during mixing. Care should be taken in the application and present a fire hazard owing to the use of petroleum solvents. Flames should not be allowed nearby during the mixing. Care should be taken in the application of chemicals to see that they are not allowed to contaminate wells or springs which serve as source of drinking water.

2.13 GUARANTEE

The Contractor shall guarantee through a guarantee bound, the anti termite work for 10 years from the date of completion of project and shall indemnify the Engineer-in-charge against any defects that arise therein during the guarantee period as aforesaid. They shall immediately rectify, any defects that may occur therein, and repair all other damage occurring to any part of the structure on account of defect in Antitermite Treatment during the guarantee period of aforesaid.

3. SPECIFICATIONS FOR CAST - IN - SITU REINFORCED CEMENT CONCRETE

3.1 GENERAL

3.1.1 DESCRIPTION

This section covers the requirements for finishing of cement concrete, proportioning, batching, mixing, testing, placing, compacting, finishing, jointing, curing and all other work as required for cast in place reinforced concrete. The contractor shall provide all the materials including cement, steel, labour, equipment, 'form work', scaffolding etc., required for completion of all reinforced concrete works as per drawings and documents. Cement concrete shall be composed of cement, fine aggregates, coarse aggregates, water with or without admixture as approved, proportioned and mixed as specified herein.

7.8.1 RELATED WORK SPECIFIED ELSEWHERE

(a) Steel Reinforcement

(b) Form Work

7.8.2 APPLICABLE CODES AND STANDARDS:

The codes and standards generally applicable to the work of this section are listed hereinafter.

IS:	383	Coarse and fine aggregates from natural sources for concrete
IS:	456	Code of practice for plain and reinforced concrete
IS:	516	Methods of testing for strength of concrete
IS:	1199	Methods of sampling and analysis of concrete
IS:	1838	Performed fillers in expansion joints in concrete non-extruding and resilient type
IS:	1946	Code of practice for use of devices in walls, ceiling and floors of solid construction
IS:	2389	Methods of testing of aggregates for concrete
IS:	2505	Concrete vibrators, immersion type
IS:	2645	Integral cement water proofing compounds
IS:	3414	Code of practice for design and installation of joints in buildings
IS:	3558	Code of practice for use for immersion vibrators for consolidating concrete

IS:	4082	Recommendation on stacking and storage of construction materials
IS:	7861	Code of practice for extreme weather concretizing
IS:	7861	Recommended practice for hot weather (Part I) concretizing
IS:	8112	Ordinary Portland Cement (Grade – 43)
IS:	12269	Ordinary Portland Cement (Grade – 53)
Is:	269	Ordinary Portland Cement (Grade – 33)

PART – I

The following clauses are intended to amplify the requirements of the reference document listed above and the contractor shall comply with these clauses.

3.2 SUBMITTALS

3.2.1 Material Report:

Prior to start of delivery of materials required, the following shall be submitted by the contractor to the Consultant / Engineer - in - Charge for approval. Suppliers and / or sources of all consumable materials including cement, steel, fine and coarse aggregates, water additives, bricks and timber etc. Quality Inspection Plan to ensure continuing quality control of ingredients by periodic sampling, testing and reporting to the Consultant on the quality of materials being supplied.

3.3 PLANTS EQUIPMENT

The Contractor shall obtain the approval of the Engineer-in-Charge for all plant items he proposes to use for the manufacture and placing of concrete. Hand mixing of concrete is strictly prohibited. The contractor should use weigh batched concrete mixers in all structural works. The concrete mixer should be calibrated as per specifications of Bureau of Indian standards and the calibration report should be submitted to the Engineer- in-charge from time to time. All other tools and tackles like concrete lifting hoist, Vibrator nozzles, mortar pans, trowel, floats etc. should be adequate at site up to the satisfaction of the Engineer-in-charge. The arrangement shall maintain all items of plant at all times in a clean and efficient working condition.

3.4 REPORTS FOR INSPECTION AND TESTING

During concreting operations, the contractor shall conduct inspection and testing as described in sub section 3.15.2 herein, and all reports thereon shall be submitted in summary form to the Engineer-in-Charge.

3.5 SCHEDULES

Before commencement of the work the contractor shall prepare working schedules of concreting giving dates and rate of pour for each item of work and submit the same to the Engineer - in - Charge for their approval.

3.6 MATERIALS

Before bringing to the site, all materials for cement concrete shall be approved by the Engineer - in - Charge. All approved samples shall be deposited in the office of the Engineer - in - Charge before placing orders for the materials with suppliers. The materials brought on to the work shall conform in every respect of their approve samples. Fresh samples shall be deposited with the Consultant / Engineer-in-Charge whenever type or source of any material changes. The contractor shall check fresh consignment of materials as it is brought on to the works to ensure that they conform to the specification and / or approved samples. The Engineer-in-Charge shall have the option to have any of the materials tested to find whether they are in accordance with specifications at the contractor's expense. All bills vouchers and test certificates which in the opinion of the Engineer - in - Charge are necessary to convince him as to the quality of materials or their suitability shall be produced for his inspection when required. Any materials which have not been found to the specification and not approved by the Engineer - in - Charge shall be rejected forthwith and shall be removed from the site by the Contractor's at his own cost within the time stipulated by the Consultant / Engineer - in - Charge. The Engineer - in - Charge shall have the powers to cause the contractors to purchase and use materials from any particular source, as many in their opinion be necessary for the proper execution of work.

3.6.1 CEMENT

Cement shall be provided and stored by the Contractor at his own cost. Cement shall be stored on a raised floor in dry weather proof & dust free but well ventilated shed. Cement bags shall be stacked close together away from external walls and in stacks of not more than ten bags to avoid lumping under pressure. Cement stored during monsoons or cement expected to be in store for more than eight weeks shall be completely enclosed in 700 micron polyethylene sheet so arranged that the flap close on the top stack. The contractor shall ensure that protective polyethylene sheet is not damaged at any time during use. Consignments of cement shall be used in order of delivery. A record shall be kept of the batch numbers of cement deliveries in such a form that the part of the works in which the cement is used can be readily identified, If during delivery or by test, the cement is found to be defective, the same shall be returned back forthwith. The contractor shall be responsible for the storage of cement at the site and no claim will be entertained in the event of any damage occurring to cement due to faulty storage by the contractor or on account of his negligence. Cement stored on site for a period longer than eight weeks shall be tested to the satisfaction of the Consultant / Engineer-in-Charge before it is used in the works. Cement that has failed the tests' conducted shall not be used in the works and shall be remarked from the site immediate by without fail. On the following types of cement as specified shall be used

- a) Ordinary Portland Cement 33 grade confirming to IS 269
- b) Ordinary Portland Cement 43 grade confirming to IS 8112
- c) Ordinary Portland Cement 53 grade confirming to IS 12269
- d) Portland Pozzolana Cement conforming to IS 1489 (Part 1 and part 2)

For concrete to be used in all structural elements in load bearing and RCC framed construction, ordinary Portland cement of 43 grade or higher is to be used. In rest of the works all the aforementioned types of cement can be used.

3.6.2 AGGREGATES

STORING OF AGGREGATE:

Aggregate shall be stored on a suitable well drained raft of concrete, timber, metal or other approved material. The storage of aggregate on the ground will not be permitted. Each size of aggregate shall be stored separately in such a manner as to prevent spillage and mixing of one aggregate with an adjacent aggregate. The dividing walls of any bins shall be of sufficient height and the aggregate shall be so deposited that a distance of 100 mm shall be left between the top of the division wall and any part of the aggregate stack. When stacking piling, the aggregate shall not form pyramids resulting in segregation of different size particles. The stacks shall be regular and of a height not exceeding two meter

a) Aggregates from natural sources shall be in accordance with IS 383. The contractor shall submit to the Consultant / Engineer - in - Charge certificates of grading and compliance from the suppliers for all consignments of aggregates. In addition at site from time to time, the contractor shall test the aggregates in accordance with IS 2386 parts I, II, III and IV. The contractor shall allow for and provide all necessary apparatus for carrying out each test and for supplying test records to the Consultant.

b) For fair faced concrete, the contractor shall ensure that aggregates are free from iron pyrites, and impurities which may cause discoloration.

c) The fine aggregates shall be river sand, stone dust or other approved sand. It shall be free from clay, loan, and earth or vegetables matter and from salt or other harmful chemical impurities. It shall be clean, sharp, strong angular and composed of hard siliceous material.

The grading of sand as determined by the method prescribed in IS 2386 part I shall be within the limits of grading zone HI given below in Table I. When the grading falls outside the percentage limits given for sieves other than 600 micron, 300 micron and 150 micron (I.S) sieves by not more than 5 percent, it shall be regarded as falling within this zone. The 5 percent can be excess submission on one more sieves.

TABLE -1**FINE AGGREGATE**

I.S. Sieve	Percentage passing for Grading			
	ZONE I	ZONE II	ZONE III	ZONE IV
10 mm	100	100	100	100
4.75 mm	90-95	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	35-60	80-100
300 micron	5-20	8-30	8-30	20-65
150 micron	0-10	0-10	0-10	0-15

The maximum quantity of silt as determined by the method prescribed in IS 2386 Part II shall not exceed 8%. Stone dust shall be within the limits of Grading Zone III given in table -1. When the grading falls outside the percentage limits given for the sieves other than 600 micron and 300 micron (IS) sieves by not more than 5 percent and on 150 micron sieves by not more than 20 percent it shall be regarded as falling within this zone. The 5 percent can be excess summation on one or more services.

3.6.2.1 COARSE AGGREGATES

The coarse aggregates shall be crushed stone or broken stone. Coarse aggregate obtained from crushed or broken stone shall be angular, hard, strong, dense, durable clean and free from soft, friable, thin, flat, elongated flaky pieces. The coarse aggregate should be from the approved source/quarry. Coarse aggregate river shingle or pit gravel shall be rounded, sound hard, clean, non porous, suitably graded in size with or without broken fragments and free from flat particle of shale, clay, silt, loam and other impurities. Except where it can be shown to the satisfaction of the Consultant that a supply of properly graded aggregate of uniform quality can be maintained over the period of the obtaining the coarse aggregate in different sizes & blending them in correct proportions as and when required. The maximum size of coarse aggregate shall be such that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and fill the corners of form work.

3.6.3 WATER

Water used in the works shall be potable water and free from deleterious materials. Water used for mixing and curing concrete as well as for cooling and / or washing aggregate shall be fresh and clean, free from injurious amounts of oil, salts, acids, alkali, other chemical and organic matter. Water shall be from the source approved by the consultant / Engineer-in-Charge and shall be in accordance with clause 4.3 of IS 456. Before starting any concreting work and whenever the source of water changes the water shall be tested for its chemical and other impurities to ascertain its suitability for use in concrete for approval of the Consultant. No waters shall be used until tested and found satisfactory. Cost of all such tests shall be borne by the Contractor.

3.6.4 ADMIXTURES AND ADDITIVES

Chemical admixtures are not to be used until permitted by the Consultant / Engineer-in-Charge in case their use is permitted, the type, amount and method of use of any admixture proposed by the contractor shall be submitted to the Consultant for approval. The contractor shall further provide the following information concerning each admixture to the Consultant / Engineer-in-Charge.

- (a) Normal dosage and detrimental effects, if any, of under dosage and over dosage.
- (b) The chemical names of the main ingredients in the admixture.
- (c) The chloride ion content, if any, expressed as a percentage by weight of admixture.
- (d) Whether or not the admixture leads to the entrainment of air when used in manufacturer's recommended dosage.
- (e) Where two or more admixtures are proposed to be used in any one mix, the manufacturer's written confirmation of their compatibility.

In reinforced concrete, the chloride ion of any admixture as determined in accordance with IS 6925 and the total chloride ion in all admixture used in concrete mix shall not exceed 0.30 percent by weight of cement.

The admixture when used shall conform to IS 9103. The suitability of all admixtures shall be verified by trial mixes. The addition of calcium chloride to concrete containing embedded metal will not be permitted under any circumstances. Regarding admixtures when used shall be based on lingo-sulphonates with due consideration to clause 5.2 and 5.30 of IS 7861. Waterproofing admixtures shall comply with IS 2645.

3.9 GRADES OF CONCRETE

The grade of concrete shall be in accordance with the following table. The grade of concrete to be used in each section of work will be shown in the drawings.

CHARACTERISTIC STRENGTH

Grade of Concrete	Characteristic strength i.e., compressive strength of 15 cm cubes at 28 days (N/mm ²)	Nominal maximum aggregate size (mm)
10	10	25

15	15	25
20	20	20
25	25	20
30	30	20
35	35	20

Unless otherwise specified in the drawings the maximum nominal size of coarse aggregate for different grades of concrete shall as under:

- | | |
|--|------|
| (a) For concreting in very narrow space or in very small thickness | 12mm |
| (b) For all reinforced concrete work except in massive foundations | 20mm |
| (c) For all ordinary plain concrete and massive reinforced foundations | 10mm |

3.10 WATER-CEMENT RATIO

The water cement ratio shall be within 0.45 & 0.70 depending upon the workability.

3.11 WORKABILITY

The workability of fresh concrete shall be such that the concrete is just suitable for the conditions of handling and placing so that after compaction, it becomes completely consistent and homogeneously surrounds all the reinforcement and completely fills the formwork. The workability of fresh concrete at the place of mixing shall be measured by compacting factor test and at the place of disposition by means of slump test. During the finalization of trial mixes, the relationship between compacting factor and slump test shall be established for each grade of concrete as well as for various levels for workability. Normally, in the condition of low water cement ratio as well as medium / high workability, the workability shall be achieved by increasing the cement content. In case where the cement content is to be limited to reduce the heat of hydration, and the water cement ratio is also kept low to reduce the permeability or due to other requirements the desired workability may be achieved with the use of limited doses of plasticizer or air entraining agent. In such cases, the method of mixing and dosages of the plasticizer/air entraining agent shall be according to the manufacturer's specification and with the approval of Engineer-in-Charge. Consistency and workability of the concrete shall be checked by measuring the slump of a truncated cone of concrete straight from the mixer under normal working conditions. The conical mould shall be of metal, 300mm high and 100mm and 200mm in diameter at top and bases respectively. Moulds shall be prepared by the contractor. The slump range of concrete shall be as per the tabulation given below, as well as standards. Slump test shall be performed as per IS 1881 at intervals established by the Engineer at the contractor's cost in such a way as to check that the degree of consistency established by the Engineer

for work in progress is maintained. The table below gives a general slump range to be followed for various types of construction unless otherwise shown on drawings or instructed by the Engineer.

Various types of Construction	Slump in mm	
	Maximum	Minimum
Reinforced foundation walls and footings	80	35
Plain footings, caissons and structure walls	75	20
Compressor foundations and for heavy mass constructions	50	20
Pumps and other misc. equipments foundations	75	35
Columns, slabs, beams and reinforced walls	100	50

3.12 DURABILITY

The durability of concrete, depending on the exposure condition, is to be taken into account while designing the mix. For given aggregates, the cement content should be sufficient to make sufficiently low water/cement ratio and Appendix A of IS 456 shall be taken as guideline for durability considerations.

3.13 NOMINAL MIX CONCRETE

Nominal mix concrete may be used for all concrete of grade up to M-20. Nominal mix concrete shall be in accordance with Table - 3 of clause 8.3 of IS 456. The stipulations of clauses 8.3.1 and 8.3.2 of IS 456 shall be taken into consideration.

3.14 VOLUMETRIC MIX CONCRETE: Where concrete is specified in volumetric proportions such as 1:4:8, 1:3:6, 1:2:4, 1:1.5:3 etc. in the bill of quantities, coarse & fine aggregates shall be measured by volume & cement by weight. The water cement ratio shall be within 0.45 & 0.70 depending upon the workability.

3.15 CAST IN-SITU CONCRETING: Before commencement of concreting, there must be a request for inspection in the prescribed format as decided by the EIC. Only after inspection and verification the concrete pour card will be approved. The criteria for approval of concrete pour card will be:

Formwork should conform to APWD

Steel reinforcement should conform to APWD

Approved quality materials should be stacked at site as mentioned above in the specifications.

Arrangement and adequacy of tools and equipments for concreting.

Proper safety arrangements are available up to the satisfaction of the EIC for concreting to commence.

Concreting methodology should strictly adhere to “Guidelines for Field Practice” as per Clause No. 5.11 of CPWD Specifications 2009 (Volume-I).

4.0 BRICKS

All bricks shall be of minimum class designation 75 of dimension 230X115X75mm size, 250X125X75mm nominal size or as locally available as approved by the EIC. Compressive strength, water absorption, warpage and dimensional tolerances etc. must conform to APWD specifications 2013-14. If required by the EIC tests, in addition to those specified in the List of mandatory tests (Annexure-) shall be conducted at the contractor's expense to ensure quality. In general, the bricks shall be the best quality locally available within the specified minimum class designation. **Brick ballast:** Under burnt bricks shall not be used for making brick ballast. These shall be made from lump ballast or bats, Ballast that is brittle and easily crushed under beaters shall not be used.

4.1 BRICK WORK

- a) Brick work in cement mortar with 7.5 designation brick including racking out joints and curing complete as directed should be executed as per APWD specifications 2009. No bricks may be used until after they have been soaked in water for a minimum period as specified in APWD specifications
- b) The brickwork should be kept moist for a period of 7 days and the methodology of curing should adhere to APWD specifications
- c) Brickwork in half Brick walls shall conform to APWD specifications

FLOORING/SKIRTING/CLADDING: Preparation of plinth filling: All plinth fillings shall be properly consolidated in layers, watered, rammed and allowed to consolidate to the EIC's satisfaction before any flooring is laid. When the flooring is to be laid over a foundation of sand, broken stone of brick or a combination of sand and broken stone or brick the filling shall be removed to a depth equal to the thickness of the flooring plus such foundation layers.

b) Foundations:

- i) Sub-layer of sand:

After the plinth filling has been prepared as detailed in specification above a sub layer of sand 300mm deep shall be laid watered and brought to an even surface.

ii) Layer of broken stone or brick:

Over the sand a foundation course of bricks shall be laid and the interstices filled in with sand, The bricks shall be tightly packed and laid so as to break joint.

c) Tile floors:

i) Foundation and cement floating under tiles:

Over the foundation as in (b) above 2 coats of cement plaster, 1 part of cement to 1 part of sand, prepared in a very liquid condition will be floated over it and allowed to set.

ii) Laying:

After the tiles have been soaked in water for at least two hours and the cement foundation sprinkled with water, laying work may commence and shall start from the centre of the room or area to be tiled, work being continued in both directions so that borders are laid last. Each tile will be laid in and drawn up in neat cement, care being taken to exclude air bubbles. Threads shall be stretched cross the surface, at intervals, parallel to the short sides of the area to be tiled to serve as guide lines.

iii) Cleaning:

After a small area has been laid all superfluous cement will be wiped off the surface. Stains shall be removed by moistening with hydrochloric acid and rubbing with pumice stone and afterwards washing with warm water.

vi) Fixing to walls:

In fixing tiles to walls the walls shall be rendered with cement plaster and the plaster scored diagonally and allowed to set. When laying the tiles work shall commence from the bottom, the back of each tile being smeared with neat cement of the consistency butter and the tile pressed into position.

6.0 CEMENT PLASTERING:

Internal plaster should be of 6mm, 12mm and 15mm. 6mm plaster should be on all concrete surfaces. 12 mm plaster should be on fair side of brickwork and 15mm cement plaster is to be executed on the rough side of brickwork.

External cement plaster should be 18mm thick in 2 layers (top layer of 6mm thick cement mortar in proportion 1:6 with an under layer of 12mm thick cement mortar in proportion 1:5).

Chicken wire mesh is to be embedded in cement concrete plaster of all RCC and brick joints.

Ceiling plaster is to be completed before commencement of wall plaster and should conform to APWD Specifications

Preparation of surface:

All putlog holes in brick work and junction between concrete and brick work shall be properly filled in advance. Joints in brick work shall be raked about 10mm and concrete surface hacked to provide grip to the plaster. Projecting burrs of mortar formed due to gaps at joints in shuttering shall be removed. The surface shall be scrubbed clean with wire brush/coil brush to remove dirt, dust etc. and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc. and shall be kept wet for a minimum of six hours before application of plaster.

Proportion:

For 12mm & 15mm thick cement plaster in prop 1:4; 6mm thick cement plaster in prop. 1:3 and for 18mm thick cement plaster the underlayer is 1:5 prop and the top layer is 1:6.

Mixing:

The cement and sand should be thoroughly mixed in dry condition. After dry mixing, the materials shall be wetted with just sufficient water to bring the mortar to proper consistency of thick paste. Mortar should be used immediately after mixing and arrangements shall be made so that not more than 30 minutes elapse between the cement first coming in contact with the moisture and laying.

Placing:

Plaster shall be laid over the prepared surface in one coat to the specified thickness and rubbed with 'PATAS' and trowel and shall be smooth, free from waviness and trowel marks. Curing the plaster must be kept wet throughout the entire process and for ten days after four hours of completion of plastering.

7.0 PAINTING:

7.01 Acrylic Emulsion Paint: The surface shall be prepared by cleaning the surfaces of the structure and making free from all dust and dirt. Interior surfaces are to be provided with 1.5mm thick wall putty punning. A primer coat either of cement primer or of an approved distemper shall be applied. After the priming coat has dried the surface shall be lightly sand papered and dusted to make it smooth to receive distemper. Distemper shall be prepared as per the directions of the manufacturers and conforming to the shade approved. It shall be applied in specified coats taking care to allow for drying of each coat before subsequent coats are applied.

7.2 Painting over wood work:

- a) The surface to be painted shall be thoroughly dry. All projections such as glue, all tool marks and other irregularities shall be carefully removed by means of a stopping knife and smoothed over and all head of nails or screws set 6mm below the surface.
- b) Knotting shall be carried out for all resinous woods such as pitch or red pine, an application of hot lime shall be applied to the portion to be stopped and allowed to remain for 24 hours after which it will be scraped off and the stopping completed.
- c) After the surface has been prepared as described above the primary coat shall be applied. When the primary coat has dried all nails and screw holes and all cracks shall be stopped and all irregularities shall be smoothed out with sand paper or pumice stone. Water proof sand paper is to be used.
- d) After the primary coat has dried out the subsequent coats shall be applied to the number specified. Each coat being allowed to dry thoroughly before the next coat is applied. Each coat when dry except the finishing coat should lightly rubbed down with sand paper and washed before the next coat is applied. The paint shall be applied evenly and properly by means of crossing and lying off the latter in the direction of the grain of the wood work.

7.3 Purchase of paint, varnish or oil:

Only the best brands obtainable will be used and should the contract permit the contractor to supply any paint, oil or varnish he shall purchase only such brands as the EIC shall approve of in writing. All purchases must be made direct from the manufacturers or through an agent approved of in writing by the EIC. Should the EIC so direct copies of all indents and receipts for purchase must be submitted for inspection.

7.4 Paint etc. to be purchased in sealed containers:

All paints, oil or varnishes supplied by the contractor must be produced for the inspection of the Engineer in charge of the work in the manufacturers sealed and unopened containers. All containers from which the contents have been removed and are not required on the work must be destroyed and no extra payment will be granted for such destruction.

7.5 Only ready mixed paint to be used

Only ready mixed or varnished of the make or brand specified will be permitted to be used exactly as received from the manufacturer without any admixture what so ever unless previously authorized, in writing , by the EIC.

8.0 DAMP PROOFING COURSE

It shall consist of 1:2:4, plain cement concrete with approved water proofing materials of specified thickness. Edges of DPC shall be straight, even and vertical side shuttering shall consist of wooden or steel forms and shall be strong and properly fixed so that it is not disturbed during compaction and mortar or cement slurry does not leak through. When forms are struck the surface should be smooth without any honey combing. The surface shall be kept wet for seven days. Before commencing the superstructure work, the top of concrete course shall be dried and cleaned of all materials. Blown type bitumen shall then be applied uniformly on the surface and the side of the concrete coming in contact with flooring on the inside shall also be painted with bitumen.

9.0 WALL PUTTY

Surface preparation for plastered wall, ceiling etc. to be done by providing average 1 mm thick polymer based wall putty punning including clearing, rubbing with sand paper, filling gaps/depression etc, to make the surface even and smooth.

10.0 WATERPROOFING

Waterproofing of Roof, Terrace, parapet walls and sunken slabs:

10.01 Waterproofing of Roof, Terrace and joints of Parapet walls and terrace: Providing and laying six courses water proofing treatment with bitumen felt over roofs consisting of first, third and fifth course of blown bitumen 85/25 or 90/15 conforming to IS : 702 applied hot @ 1.45, 1.20 and 1.45 Kg per square metre of area respectively, second and fourth courses of roofing felt type 3 grade I conforming to IS : 1322 (Hessian based self finished bitumen felt) conforming to size or pea sized gravel spread at 6 cubic dm per sqm including preparation of surface but excluding grading, complete.

10.02 Waterproofing of sunken slabs: Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of : (i) Ist course of applying cement slurry @ 4.4 kg/sqm mixed with proportions including rounding off junction of vertical and horizontal surface. (ii) IInd course of 20 mm cement plaster 1:3 (1 cement : 3 coarse proportion including rounding off junction of vertical and horizontal (iii) IIIrd course of applying blown or residual bitumen applied hot at (iv) IVth course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 kg/sqm).

10.03 Repair of cracked surfaces during construction phase and defect liability period:

- Repair damaged cement plaster or concrete mortar with Mastercrete M-81, acrylic modifier or similar waterproofing compound as directed by the EIC. The specification and methodology of application will be product specific.

- Cracks wider than 2mm must be sealed with polysulphide sealant or as directed by the EIC. □
- The joint of parapet wall & roof slab should be sealed and waterproof up to the satisfaction of the EIC. □
- Any other waterproofing treatment if required and is not specified above is to be executed within the same coated rate up to the satisfaction of the EIC and the OWNER. □

11.0 OVER HEAD WATER TANK

Over head water tank of plastic cylindrical vertical closed top (PCVC) tank of Syntax/Polycon/Patton make over the staging with manhole cover with locking and cleaning arrangement including providing pads of size as required for inlet and outlet pipes complete as directed.

SPECIFICATION OF SANITARY / PLUMBING WORK

- 1 Section -I: Sanitary fittings
- 2 Section-II: Soil, waste pipes and fittings
- 3 Section-III: Water supply pipes and fittings
- 4 Section-IV: Sewers and drains

TECHNICAL SPECIFICATIONS FOR SANITARY FITTINGS

1.0 SANITARY WARES AND ALLIED FITTINGS:

All sanitary wares with their allied fittings must be first quality (best) as per approved make these should be approved by the Architects/Consultants, before use. No extra claim will be entertained for concreting for encasing the bottom or making bed for setting of IPWC, which are to be included in tender items. The flushing cisterns shall be automatic or manually operated high level or low level, as specified for water closets and urinals.

2.0 SQUATTING PATTERN WC PAN (INDIAN TYPE)

The WC Pan shall be of white vitreous China of specified size and pattern (Orissa or long pattern as specified) with an integral flushing rim. It shall have the flushing horn in the back unless it is not possible to cistern to suit this design. It shall have 100 mm SCI or porcelain trap 'P' or 'S' type with minimum effective seal of 50 mm and 50 mm vent arm. The rest of the execution methodology should conform to APWD Specifications. Colour, Make and model are to be approved by the Engineer-in-charge.

3.0 PEDESTAL WASH DOWN SYPHONIC (SINGLE OR DOUBLE TRAP) WATER CLOSET (EUROPEAN TYPE) As per IS: 2556 :

The WC Pan shall be of white vitreous Chin unless otherwise specified of one piece construction of wash down type with integral 'P' or 'S' trap as required. It shall be of approved quality and pattern. The rest of the execution methodology should conform to APWD Specifications. Colour, Make and model are to be approved by the Engineer-in-charge.

3.1 INSTALLATION

The weight of the fixture and user are supported on the floor and not on the drainage pipe and this should be done in standard approved method.

3.2 SEAT AND COVER

The seat with lid shall be of plastic seat as specified with rubber buffers and shall be fixed in position by using Chromium plate hinges and screws, The seat shall be non-absorptive and from cracks and crevices in the materials. The plastic seat and cover where specified shall conform to L.S. specification and shall be of white colour unless otherwise specified. . The rest of the execution methodology should conform to APWD Specifications. Colour, Make and model are to be approved by the Engineer-in-charge.

4.0 FLUSHING CISTERNS

Flushing cisterns should conform to APWD Specifications. Colour, Make and model are to be approved by the Engineer-in-charge.

5.0 URINALS

Urinals should conform to APWD Specifications. Colour, Make and model are to be approved by the Engineer-in-charge.

6.0 WASH BASIN

6.1 BASIN

The wash basins shall be of white or coloured vitreous China as specified and of approved quality, make and pattern, conforming to IS Specification. It shall be one piece construction with an integral combined overflow. The size of the basin shall be as specified.

6.2 FITTINGS

Each wash basin shall be provided with 15 mm CP brass pillar taps as specified, 32 mm CP waste CP Chain and rubber plug, union joints CP brass bottle trap of approved quality and design, with CP brass stop cock and P.V.C water inlet pipe of standard length dia. etc. complete in all respects of approved quality. **PAINTING** All brackets pipes etc shall be painted with two coats of enamel paint over a coat of primer.

6.3 FIXING

The basin shall be supported on a pair of MS or CI. Cantilever brackets in cement mortar 1:3 of requisite strength embedded or fixed in cement concrete 1:2:4 block position screws. These brackets shall be fixed in position before dado work is done and painted to the required shade including a coat of anticorrosive paint. The wall plaster on the rear shall be cut to overhang the top edge of the basin. Further, the fixing arrangement mentioned above may be changed as per the direction of the EIC depending upon the position of fixing.

6.4 WASTE CONNECTION

The waste shall discharge into a floor trap and slotted CP jail leading to a gully trap, on ground floor and on upper floor it may be connected to waste pipe stack. Where specified wash basins shall be provided with a 20 mm G.J. Puff Pipe terminating with a brass perforated cap screwed on to it on the outside of the wall or connected to anti-siphon stack. When the waste pipe discharges freely into a channel or floor trap and is of short length without any bends, no puff will be necessary.

7.0 KITCHEN SINKS

Unless otherwise mentioned the kitchen sink with drain board shall be of stainless steel as specified and of approved quality, make and pattern. It shall be of one-piece construction with an integral combined overflow. The size of the sink & drain board shall be as specified.

7.1 FITTINGS

Each sink shall be provided with 15 mm bib cock, 40 mm Waste, chain and rubber plug, unions, joints etc. complete in all respects as specified and of approved quality.

7.2 FIXING

The sink shall be supported on a pair of MS or CI. Cantilever brackets in cement mortar 1:3 of requisite strength embedded or fixed in cement concrete 1:2:4 block position screws. These brackets shall be fixed in position before dado work is done and painted to the required shade including a coat of anticorrosive paint. The wall plaster on the rear shall be cut to overhang the top edge of the basin. Further, the fixing arrangement mentioned above may be changed as per the direction of the EIC depending upon the position of fixing.

7.3 WASTE CONNECTION

The waste shall discharge into a flow trap and slotted CP jail leading to a gully trap, on ground floor and on upper floor it may be connected to waste pipe stack.

8.0 TOILET

8.1 MIRROR

The mirror shall be of approved make glass with beveled edges, as per drawings.

8.2 CHROMIUM PLATED STOP COCK, TAPS, BIB COCKS, GUN METAL PEETS VALVES

Where not mentioned, cock's and taps are to be of brass standard head chromium plated and are to be of approved make and brand as specified. They must be capable to withstand at least 10.5 Kg / cm² pressure applied for 5 minutes without leakage. The valves are to be of peat type gunmetal valves of 'Leader' brand. Other conditions remain same as cocks and taps.

8.3 BOTTLE TRAP: PTMT bottle trap are provided for wash basin and urinal. Bottle trap of 3/4" single pair moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling, 77mm breadth, with 25mm min. water seal.

8.4 TOWEL RING

Towel ring shall be of trapezoidal shape with 1 CP brass or aluminium bracket.

8.5 TOILET PAPER HOLDER

The paper holder shall be of CP brass or vitreous China as specified.

TECHNICAL SPECIFICATIONS FOR SOIL WASTE PIPES & FITTINGS

1.0 UPVC WASTE PIPE

UPVC pipes are chemical resistance and insulation with uniform wall thickness. UPVC pipes are conforming to IS-12818. These pipes are manufactured as per BIS standard and are available in deep blue colour. One end of the pipe is male threaded where as other end is female threaded socket. Threads are either V or trapezoid type and protection caps are provided on the threads to protect the threads in transit. Two types of pipes i.e. Shallow Well (C.S.) and Medium Well (C.M.) are available. Shallow Well Pipes can be used for depths up to 80 meters and Medium Well pipes can be used up to 250 meters.

2.0 UPVC FITTINGS

The uPVC waste pipes fittings and their installation should conform to the specifications of approved manufacturer as per the approval of Engineer-in-charge.

3.0 Polyvinyl Chloride (PVC) Soil and Rain water Pipes

The specification covers requirements for plain and socket end polyvinyl chloride (pvc) pipes with nominal outside diameters 40 mm to 160 mm for use for rain water applications. In this specification nominal outside diameter DN of pipes are 40, 50, 63, 75, 90, 110, 125, 140 and 160 mm. Surface colour of the pipes shall be dark shade of grey. For other details and specifications refer code IS: 13592-1992 (amended to 1995).

3.0 CAST IRON PIPES AND FITTINGS IN SOIL PIPES AT DRAIN / PLINTH PROTECTION CROSSINGS: The cast iron soil pipes (spigot and socket joints) shall be of approved make brand with projecting ears cast or cast iron (centrifugal cast) soil pipes manufactured by M/s. INDO Swedish Pipe Manufactures Ltd., Agra with approved clamps or other approved make as specified. The methodology of execution and quality of the material should conform to APWD Specifications.

PART D

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORK

SCOPE OF WORK:

- All conduits shall be of 2mm thick PVC and all accessories such as normal bends, unions circular junction boxes and pull boxes, lock, nuts etc. shall be heavy gauge type of approved make and in all respects shall conform to IS-3738-1966.
- Lighting installations to be designed in accordance with modern practice and in accordance with IS code for interior lighting.
- All non -current carrying metal parts of electrical installations shall be earthed as per IS 3034-1966. Earthing shall be in conformity with provision of rules 32,61,62,67&63 of Indian electricity rules 1956.
- Lying of cables shall be as in detailed specification for electrical works.
- Ceiling Fan shall be provided with electronic regulator.
- Exhaust fans in hall & toilets.
- Metal clad socket cover point shall match the wall surface.
- Telephone wire conduit shall be provided up to JB with double pair 0.6mm dia., ATC telephone cable from each point to Telephone JB tag Block. Telephone connections shall be provided in drawing rooms and bedrooms.
- Telephone wire conduit shall be provided up to JB with six pair 0.6mm dia., ATC telephone cable from each point to Telephone JB tag Block for the VIP rooms of Guest House.
- PVC pipe under floor for crossing telephone cables etc.
- Lighting protection shall be provided at top of building with 1 nos. 25mm dia 300mm long spike having single 25 x 3mm G.I. tape over horizontal and vertical down conductor up to testing joints to earth station should be 32x6mm and 4 nos. plate earthing as approved by Architect Point earthing shall be provided.
- Telephone tag blocks having minimum 10 pairs shall be provided and 1 no. telephone shaft.
- For anything not mentioned here, please refer to drawings for details.

GENERAL:

1.1 All electrical work shall be carried out in compliance with specifications given hereunder in this section and in compliance with Indian Standard specifications and

Indian Electricity Act and Rules in force. The works shall also conform to any special requirement of local State Electricity Board. In case, the above mentioned, regulations etc. are not in accord, the decision of the Engineer-in-charge/Consultant regarding rules to be followed or manner of execution of work shall be final and binding. The work shall be executed under the direct supervision of person holding a certificate of competency issued by the State Government (Chief Electrical Inspector)

1.2 These special conditions of contract shall be read in conjunction with the General Conditions of contract, Schedule of Quantities, Technical Specifications, Drawings and other documents relating to the work and shall have preference over laid down general conditions and specifications.

1.3 Notwithstanding the sub-division of the documents into these separate sections and volumes, every part of each shall be deemed to be supplementary and complementary to every other part and shall be read with and into the contract, so far as it may be practicable to do so.

1.4 The contractor shall mobilize and employ sufficient resources to achieve the detailed schedule within the board framework of the accepted methods of working and safety. The contractor shall provide everything necessary for the proper carrying out of the work, including tool plant and other materials.

1.5 No additional payment will be made to the contractor for any multiple shift work or other incentive methods contemplated by him in his work schedule even though the time schedule is approved by the Architect/Engineer-in-charge.

1.6 The work shall be executed as per the programme drawn on approved by the Architect and it shall be so arranged as to have full co-ordination with any other agency employed at site. No claim on account of the delay in the completion of the building work be tenable except extension of time secured by the contractor as stated elsewhere.

1.7 The contractor shall permit free access and afford normal facilities and usual conveniences to other agencies or departmental workmen to carry out connected work or other work services under separate arrangements. The Contractor will not be allowed any extra payment on this account.

1.8 All soil, filth or other matter of any offensive nature taken out of any trench, sewer drain, cesspool or other place shall not be deposited on the surface but shall at once be carted away by the contractor from of charge to a suitable pit or place to be provided to him.

1.9 The contractor shall provide all equipment, instruments, labour and such other assistance required by the Engineer-in-charge for measurements of the work, materials etc.

2.0 MATERIALS

2.1 All materials, equipment, fittings and fixtures used in electrical works shall conform to I.S.I. All material shall be new, soundly and robust in construction and well finished. Surplus materials

after completion of work shall be taken back by the contractor and the cost shall be recovered if the advance payment has been made earlier by the Client.

2.2 Unless otherwise stated in the conditions of contract samples of all materials, fittings and fixtures to be supplied by the contractor shall be submitted to the EIC/Consultant for his approval. The contractor shall not commence the work until the samples are approved, in writing from the EIC/Consultant. The contractor shall ensure that all the

material incorporated in the work are identical in all respects with the approved sample. All samples not destroyed in testing shall be returned to the contractor after completion of contract. No payment shall be made for samples destroyed in testing.

3.0 DRAWINGS

3.1 The drawings and specifications shall be considered as a part of this contract. Any work or materials shown on the drawings but not included in the schedule of quantities or vice-versa, shall be executed as if specifically called for in both without any additional cost. The contract drawings indicate the extent and general arrangement of various equipment and their wiring etc. and are essentially diagrammatic. The work shall be installed as indicated on the drawings, however, any minor change if found essential to co-ordinate the installation of this work with other trade shall be made without any additional cost to the Owner. The data given herein and on the drawings is as could be secured, but its complete accuracy is not guaranteed. The drawings and specifications are for the assistance and guidance of the contractor, the exact locations, distances and levels will be governed by the space conditions. The contractor shall be responsible to check exact location of all electrical outlets, the routes and lengths of cables etc.

4.0 CLARIFICATIONS OF DISCREPANCIES

4.1 In case of any discrepancy between specifications and drawings etc., furnished by the Architect or disputes in respect thereof, the interpretation of the Director (Technical) shall be final and binding.

5.0 MISCELLANEOUS

5.1 A site order book will be maintained at site which will be in the custody of the Architect or his representative and all instructions given to the contractor will be recorded in the site order book and the same has to be signed by the contractor to comply with the instruction given therein.

5.2 After completion of the whole installation shall be tested by the contractor in the presence of the Architect. The tests shall comply the following I.E.E. Regulations and shall be submitted along with the final bill.

- a) The result of the insulation test shall comply with the I.E.E. Regulations 1101 to 1108A and 1108B with latest amendment as may be applicable.
- b) Test shall be carried out to ascertain that all the non-linked SP switches have been connected to the phase conductor.
- c) The continuity test of the earthing system shall comply with I.E.E. Regulations 1108 to 1109 to the latest addition.

If the results of the above tests does not comply with the I.E.E. Regulations, the contractor shall be bound to rectify the faults so that the required results are obtained at no extra cost. The contractor shall be responsible to provide all the necessary testing instruments, such as mage up to 2.5 kV range insulation tester, earth tester multimeter, AVO meter etc. for carrying out the above tests.

5.3 The work will not be considered as complete and taken over by the Employer till all the components of the work after being completed at site in all respects have been inspected / tested by the Engineer-in-charge/Consultant to his entire satisfaction and a completion certificate issued by the EIC/Consultant to this effect.

5.4 At the completion of the work and before issuance of certificate of virtual completion, the contractor shall submit to Architect layout drawings one reproducible and 4 set of prints drawn at approved scale indicating the complete wiring/conduiting/cabling/earthing system as installed.

5.5 The contractor will submit within 15 days of the award of work, a detailed sequence of work.

6.0 WORK AND WORKMANSHIP

6.1 The work shall be of the highest standard,/both as regard its design and workmanship. Modern tools and first class, latest techniques shall be employed for its execution.

6.2 Any damage done to the building during the execution of work shall be responsibility of the contractor and it shall be made good by him, at his cost, to the entire satisfaction of the Consultant.

6.3 All electrical work shall be executed by skilled and duly licensed electricians under the direct supervision of whole time, fully qualified licensed electrical engineers and supervisors. The contractor shall produce requisite evidence regarding the qualification of the engineer, supervisors and other workers.

6.4 The contractor shall possess all the relevant and valid licenses as per the regulations of the Indian Electricity Rules and the Local Electrical Inspector's requirements.

6.5 The work shall have to be in co-ordination with the building work and other allied jobs/trades to the entire satisfaction of Engineer-in-charge/Consultant.

7.0 CERTIFICATE OF INSPECTION

7.1 The contractor shall be responsible for getting the installation inspected and approved by the Electrical Inspector and other, level electrical supply company as required.

7.2 The contractor shall obtain and deliver to the Architect the certificate of final inspection and approval of the local electrical authorized concerned. The inspection fees etc. shall be borne by the contractor.

7.3 In case of any defect/s pointed out by the Electrical Inspector, the contractor shall remove these defects at his own cost and arrange for re-inspection or inspection by the electrical inspector, till such time the installation is finally approved and the required certificate is issued. The contractor shall bear all expenses and deposit the necessary fees for subsequent inspections by the Electrical Inspector.

7.4 The Consultant shall have full powers to get the material or workmanship etc. inspected and tested by an independent agency, at the contractor's expenses in order to ascertain their soundness and adequacy.

7.5 Conduit layout for Electrical works shall be prepared by the contractor and got approved before starting of the work.

7.6 In the event of any clarification necessary. The contractor should consult EIC/Consultant.

STANDARD / TECHNICAL SPECIFICATION (ELECTRICAL WORK)

CONDUITING:

All PVC conduits shall be of manufactured 2mm thick up to 32mm dia and of 3mm for sizes higher than this. Both inner and outer surfaces shall be smooth without burrs, dents and kinks. Conduits shall be black stove enameled inside and outside. The cross section of conduit shall be uniform throughout. The

welding shall be uniform such that welded joints do not yield when subjected to flattening test. Welded joint shall not break when threaded or bent at an angle. Conduit shall conform to specifications of IS-1653-1972 and the capacity conduits shall be in accordance with the standards and shall never be exceeded. The minimum size of the conduit shall be 20mm dia. Conduit accessories such as normal bands, unions, circular junction boxes and pull boxes, lock nuts etc. shall be heavy gauge type and approved make. Conduit accessories shall conform in all respects to IS-3837-1966. Conduits shall be laid before casting in the upper portion of a slab or otherwise, as may be instructed or in accordance with approved drawings, so as to conceal the entire run of conduits and ceiling outlet boxes. Vertical drops shall be buried in columns or walls. Wherever necessary, chases will be put by the contractor with the prior orders of the Consultant In case of exposed brick/rubble masonry work special care shall be taken to fix the conduit and accessories in position along with the building work. Sufficient depth of the chases will be made to accommodate the required number of conduit. The chase will be filled with cement, coarse sand mortar (1:3) and properly cured by watering for one week. If a chase is cut in an already finished surface the contractor shall fill the chase and finish it to match the existing finish. Contractor must not cut any iron bars to fix conduits. Conduits shall be kept at a minimum distance of 100mm from the pipes of other non-electrical services. Where the conduits is to be embedded in a concrete member it shall be adequately tied to the reinforcement to prevent displacement during casting, conduits in chases shall be held by steel hooks of approved design at maximum of 60cm centers .The embedding of conduits in walls shall be so arranged as to allow at least 12mm plaster cover the same. All threaded joints of conduit pipes shall be treated with some approved 'preservative compound' to secure protection against rust. Suitable expansion joints fittings of approved make and design shall be provided at all the points where the conduit crosses any expansion joints in the building. Separate conduit shall be used for:

- a) Normal light, fan and 5A 3 pin/2 pin sockets.
- b) Power outlets
- c) Telephones
- d) TV/Antenna

Wiring for short extensions to outlet in hung ceiling or to vibrating equipment, motors etc. shall be installed in flexible conduits. Flexible conduits shall be formed from a continuous length of spirally wound interlocked wire steel with a fused zinc coating on both sides. The conduit shall be watertight type with approved type adopted. A separate and accessible earth connection shall bond across the flexible conduit. Conduit runs on surfaces shall be supported with metal 12 gauge thick saddles, which in turn are properly approved on to G.I. M.S. spacer to the wall or ceiling, saddled shall be at intervals of not more than 50 cm. Fixing screws shall be with round or cheese head and of rust proof materials. Exposed conduits shall be nearly run parallel or at right angles to the walls of the building and shall be painted in colour matching the adjoining area. Unseemly conduit bends and offsets shall be avoided by using better appearance. Cross cover of conduits shall be minimum and entire conduit installation shall be clean and with good appearance. No conduits are allowed to be run in the floor except by special permission of consultant and this only in extra ordinary circumstances by coating of bitumen over conduit. PVC bushes of approved quality shall be used in each conduit termination in a switch box, draw box, lighting fixtures

and circular junction boxes as required. Exposed conduits running above false ceilings shall be suitably clamped with the dropped ceiling. Perforated straphangers or twisted attachment shall not be acceptable. In no case shall raceways be supported or fastened to other pipe for repair and maintenance.

They shall be arranged symmetrically and in the cost compact design in no way unduly criss-crossing each other. Proper spacing shall be maintained when two or more conduits run side by side. The layout of the pipes shall be co-ordinated with the shop drawing for dropped ceiling. The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to berth conforming to the requirements by means of special approved type of earthing clamp efficiently fastened to conduit pipe in a workman like manner for a perfect continuity between the earth and conduit. The conduit system shall be so laid out that it will obviate the use of teas, elbows and sharp bends. No length of conduit shall have more than the equivalent of two quarter bends from inlet to outlet. The conduit itself being given required smooth bend with radius of bends suiting to the site conditions but not less than 6 times overall diameter. The conduits shall be of ample sectional area to facilitate the drawings of wires/cables. In no case shall the total cross section of wires/cables measured overall, be more than half the area of the conduit. Outlet boxes shall be of 18 SWG sheet steel and so installed as to maintain continuity throughout. These shall be so protected at the time of lying that no mortar finds it was during concept concrete filling on plastering. For fluorescent fitting, 2 Nos. outlet boxes shall be provided 300mm off centre for a 1200mm fitting and 150mm off centre for a 600mm fitting. Draw boxes of ample dimensions shall be provided at convenient points to facilitate pulling of long runs of cables. They shall be completely concealed with M.S. covers flush with plaster work painted to match the wall. These boxes will be as few as possible and located where found suitable by the consultant. All the G.I. sheet/zinc passivated boxes used for housing switches, plugs, fan regulator etc. shall be five sided conforming to IS-5133 Part I-1969 with latest amendment. The boxes shall be provided with four to six fixing lugs located at the corners and vertical sides. All fixing lugs shall be threaded to receive standard machined chromium plated brass screws. Sufficient number of knockouts shall be provided for conduit entry. Conduits carry wires of different circuit can terminate in common J.B. having metal compartments. Necessary G.I. pill wires shall be inserted into the conduit for drawing wires. The switch boxes used for housing switches, plug/ fan regulator etc. shall be in passivated /GI five sided. Provision of bridge for mounting fan regulator and necessary brass earth point shall be provided on the box, as required. These shall be attached to conduits by means of check nuts on either side of their walls. These shall be completely concealed leaving edges flush with all surfaces. Moulded switch plates shall be fixed to these by means of chromium plated brass machine screws as required. The switch box shall be provided with earth terminal. No. timber shall be used for any supports. Boxes, which come within concrete, shall be installed at the time of casting. Care shall be taken to fix the box rigidly so that its position is not shifted while concreting. The entire conduit system including outlet and boxes shall be thoroughly cleaned after completion of erection and before drawing in cables. To safeguard against filling up with the plaster etc. all the outlet boxes and switch boxes will have to be provided with temporary covers or PVC stoppers within the tendered cost which shall be replaced by 3mm thick Bakelite covers/moulded type switch plates as required.

WIRING

P.V.C. insulated copper conductor cable shall be used for sub-circuit runs from the distribution boards to the points and shall be pulled into conduits. They shall be stranded copper conductors with thermoplastic insulation of 660 volts grade. Colour Code for wiring shall be followed.

Looping system of wiring shall be used, wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors with prior permission of the consultant. No. reductions of strands are permitted at terminations. No wire smaller than 1.5 sq.mm shall be used. Wherever wiring is run through trunkings or raceways, the wires emerging from individual distributions shall be bunched together with cable straps at required regular intervals. Identification ferrules indicating the circuit and D.B. number shall be used for sub mains, sub-circuit wiring. The ferrules shall be provided at both end of each submain and sub-circuit. Where single phase circuits are supplied from a three phase and a neutral distribution board, no conduit shall contain the wiring fed from more than one phase. In any one room in the premises where all or part of the electrical load consists of lights, fans and/or other single phase current consuming devices, all shall be connected to the same phase of the supply. Circuits fed from distinct sources of supply or from different distribution boards or through switches or M.C.Bs shall not be bunched in one conduit. In large areas and other situations where the load is divided between two or three phases. no two single phase switches connected to different phase shall be mounted within two meters each other. All splicing shall be done by means of terminal blocks or connectors and no twisting connection between conductors shall be allowed. Metal clad sockets shall be of dia cast non-corroding zinc alloy and deeply recessed contact tubes. Visible scraping type earth terminal shall be provided. Socket shall have push on protective cap. Socket shall have MCB as specified in the schedule of work. All power sockets shall be piano type/moulded plate switches with associated switch of same capacity, switch and socket shall be enclosed in a G.I. sheet steel/zinc passivated boxes enclosure with the operating knob projecting. Entire assembly shall be suitable for wall mounting with a Moulded plate switch cover. Switches shall be connected on the live wire and neutral of each circuit shall be continuous everywhere having no fuse or switch installed in the line excepting at the main panels and boards. Each power plug shall be connected to each separate and individual circuit unless specified otherwise. The power wiring shall be kept separate and distinct from lighting and fan wiring. 10/20A metal clad socket outlet cover shall be spray painted matching to the wall surface. Balancing of circuits in three phases installation shall be arranged before installation is taken up. Unless otherwise specified no more than ten light points shall be ground on one circuit and the load per circuit shall not exceed 1000 watts. The earth continuity PVC insulated copper wire in Green colour shall be run inside the conduit to earth the third pin or socket outlets earth terminal of light fixtures, fans etc. as required. Light points shall be either of single control, twin control or multiple points controlled by a single switch/MCB as per schedule of work. Bare copper wire shall be provided with each circuit from DB as specified in the item of work and terminated in earth bar of DBs and switch boxes with proper lugs as required.

LUMINARIES

The lighting installation has been designed in accordance with modern practice and generally in accordance with modern practice and generally in accordance with ISI code for Interior Lighting. The

scope of the work shall be supply, installation, connection and commissioning of all lighting fixtures as specified herein and shown in the drawings. Light fixtures shall be fixed in a workman like manner as per best trade practices and according to the instructions of the manufacturers, Lighting fixtures which are recessed in the dropped ceiling shall be thoroughly matched and co-ordinated with the pattern and design of the dropped ceiling as shown in architectural drawings. Care shall also be taken to co-ordinate the lighting fixtures details with all other services such as air-conditioning, plumbing. It has to be ensure that all light fixtures in a row are in the same line and level and at exactly equal distances unless otherwise required. All the materials used in the construction of luminaries shall be of such quality, design and construction that will provide adequate protection in normal use, against mechanical, electrical failures/faults and exposure to the risk of injury or electric shock and shall withstanding the effects of exposure to atmosphere.

EARTHING

All non current carrying metal parts of electrical installation shall be earthed as per IS 3043-1966. All metal conduits, cable sheathes, switchgear, DBs, light fixture, equipment and all other parts made of metal shall be bonded together and connected to earth electrodes. Earthing shall be in conformity with provision of Rules 32,61,62,67, and 63 of Indian Electricity Rules 1956. All earthing shall be of high conductivity copper, G.I. and shall be protected against mechanical damage. The cross-sectional area of earth conductors shall not be smaller than half that of the largest current carrying conductor. However the contractor shall use the sizes specified in the bill of quantities.

- a) All fixtures, socket outlets, fans switch boxes and junction boxes etc. shall be earthed PVC insulated copper wire as specified in item of work. The earth wires ends shall be connected with solderless bottle type copper lugs.
- b) All single phase DBs up to 60Amps shall be earthed with 8 SWG GI wire as per Item of work.
- c) All three phases switch board up to 100 Amps rating shall be earthen with 2 Nos. distinct and separate 4 SWG GI wire as per item of work.
- d) All switch board of rating more than 100 A and above shall be earthen with 2 Nos. separate and 25x6mm G.I. tape or as per item of work/drawing.
- e) All the earthen wires in switch boxes, DBs and light fixture shall be provided with green colour PVC sleeving.

Main earth bus shall be taken from the L.T. switch board to earth electrodes. The electrical resistance of earthing conductors shall be low enough to permit passage of fault current necessary to operate fuse or circuit breaker and shall not exceed 1 ohm. The earthing electrodes shall consist of plate (60cm x 60cm x 3mm) thick tinned copper plate or GI MS plate electrode (60cm x 60cm x 6mm) or GI pipe 40mm dia and 4.5 meter length 'B' class as described under schedule of quantities, Galvanising of the pipe/plate shall conform to relevant Indian Standards. The plate electrode shall be buried in ground with its face

vertical and top not less than 3mm below G.L. The earth plate pipe shall be buried in the ground below the permanent moisture level but not less than 3.7 metre below ground level. The plate shall be filled with charcoal dust and common salt filling extending 15 cm around it on all sides. There shall be “a” 20mm dia ‘B’ class GI pipe running from top of plate up to the ground level for watering pipe. The top of the pipe shall be provided with a funnel and a GI mesh screen for watering the earth. This will be housed in a masonry sump with cement plastering or a cement concrete sump not less than 30cm square and 30cm dep. A.M.S. frame with hinged cover and locking arrangement shall be suitably provided over the G.I. pipe electrode shall be cut tapered at the bottom and provided with holes of 12mm dia, drilled not less than 7.5cm from each other up to 2.0 metre of length from bottom. The pipe shall be buried in the ground vertically with its top not less than 20cm below ground level. The earthing lead from electrode onwards shall be suitably protected from mechanical injury by a 15mm dia, GI pipe in case of wire and by 40mm dia ‘B’ class GI pipe in case of strip portion of this protection pipe within ground shall be buried at least 30cm deep (to be increased to 60cm in case of road crossing and pavements). The portion within the building shall be recessed in walls and floors to adequate depth. In the case of plate earth electrode the earthing lead shall be securely bolted to the plate with two bolts, nuts checknuts and washers. In case of pipe earth electrode, it shall be connected by means of through bolt, nuts and washers and cable socket. All materials used for connecting the earth lead with electrode shall be GI in case of GI pipe and GI plate earth electrodes and of tinned brass in case of copper plate electrode. No earth pit shall be fixed within 2 metre of a wall or foundation. Efforts shall be made to locate them in grass lawns or near flower beds or water taps. The distance between two earthing stations shall be at least 2 metres.

CABLE TERMINATIONS

All the cable termination shall be executed with crimping tool using DOWEL make cable socket. Compression brass cable glands wherever used shall be of correct size for cable and terminations. No oversize cable glands shall be used. The gland must grip the armour of the cable firmly, so that in the event of ground movement no undue stress is transferred to the cable conductors. Corrosion inhibiting compound shall be applied on the conductor before crimping the lugs. The gland must establish good electrical contact between cable armour, load sheath and body of switch gear. Identification ferrules indicating the circuit shall be used for incoming and outgoing cables. The ferrules shall be provided at both ends of each cable.

CABLE WORK

While laying underground cables, care should be taken so that any underground structure such as water pipes, sewage lines etc. are not damaged. Any telephone or other cable coming in the way shall be properly protected as per instructions of the Architect. The LT cables shall be laid not less than 90cm below ground level in a trench 45cm wide minimum. The depth of the trenches shall be uniform throughout. When the cables is properly strengthened and laid in the trench, it should be covered all around 80mm thick layer of sand. Approved cable indicators shall be fixed at suitable distance along the

route of the cable. Unless otherwise specified the cables shall be protected by second class bricks of not less than 22.5 x 10 x 7cm or stone tiles or any other approved material placed on sides and top of the cable to form a channel throughout the length. Stoneware pipes or spun reinforced concrete pipes shall be provided for all road crossings. The size and nature of the shall be decided by the Engineer-in-charge and shall not be less than 10cm in dia meter for a single cable and not less than 20cm for more than one cable. These pipes shall be laid in the ground with 10cm in diameter for a single cable and not less than 20cm for more than one cable. These pipes shall be laid in the ground with 10cm thick bed of cement concrete 1:5:10 and may be loose jointed. The top surface of pipe shall be at a minimum depth of 90cm from the ground level when laid under the roads/pavements.

DISTRIBUTION BOARDS

Distribution boards shall be of standard make with MCBs as per approved make given Appendix 'A' Distribution boards shall be constructed out of 16 SWG sheet shall be painted with enamel paint. Ample clearance between the conductors of opposite pole, between conductors and sheet steel body shall be maintained in other to obviate any chance of short circuit. Removal conduits entry plates shall be provided at top and bottom to facilitate drilling holes at site to suit individual requirements. The MCBs shall be mounted on a high grade rigid insulating support and connected by electrolytic copper bus bars. Each incoming MCB isolator shall be provided with solderless cable sockets for crimping Phase separation barriers made out of are resistant materials shall be provided between the phases. Bus bars shall be colour coded for phase identification. Distribution board shall be recessed in wall nitch or if required mounted on the surface of the wall with necessary clamp bolts etc. as required at a height not exceeding 1600mm from finished floor level. Distribution board shall be provided with proper identification name plate danger mark etc. All the distribution board shall be marked 'lighting' 'power' or 'Emergency' as the case may be. Each DB shall be provided with a circuit list giving details of each circuit. All the outgoing circuit wiring shall be provided with identification ferrules giving the circuit number and phase. Each distribution board shall have a separate neutral connection bar and a separate earth connection bar mounted within the board each having the same number of terminals as the total number of outgoing individual circuits from the distribution board. Suitable earth terminal shall be provided on the distribution board for bonding to earth.

Distribution boards shall be duly rust inhibited through a process of degreasing, acid picking phosphating and spray primer. The entire board shall be rendered dust and vermin proof with necessary sealing gaskets. MCBs shall have quick make and break non- welding silver alloy contacts, both on the manual and automatic operation. MCBs shall be of thermal magnetic type with reverse time-delay over-current tripping having a short circuit rupturing capacity of 9 KA. In case of multiple brackets, the tripping must be on all the poles and shrouded, wherever MCB isolators are specified they are without the tripping elements. Necessary adopter box of suitable size shall be provided to facilitate the wiring and nothing shall be payable on this account.

SWITCH BOARDS (CUBICAL TYPE) WITH MCCB

The switch board shall be metal clad, totally enclosed, single front, floor mounted, cubical type for use on 415 volts 3 phase, 50 cycles systems with a fault level withstand of 35 KA RMS symmetrical. The switchboard shall be made up of the requisite vertical sections, which when coupled together shall form continuous dead front switchboards of dust and vermin proof construction. The panels shall be fully compartmentalised and shall be arranged in multi-tier-formation. The top and bottom of each compartment shall have barrier of minimum 14 SWG M.S sheets. The structure shall be of rigid welded/bolted construction with C.R.C. sheet steel of not less than 14 SWG thicknesses. The doors, covers, barriers etc. shall be made of 14 SWG thick sheet steel. A base channel of minimum 75mmx75mmx5mm thickness shall be provided at the bottom. At least 250mm space shall be provided above channel (i.e. 325mm from floor) in which no switch gear shall be fixed. Joints of any kind in sheet metal shall be seam welded, all welding slog grounded off and welding pits wired smooth with plumber metal. All panels and covers shall be properly fitted and square with the frame. Holes in the panels shall be correctly provided and tapped into an adequate thickness of metal or provided with nuts, for convenient fixing of screws, self threading of screws shall not be used in the fabrication of the panels. All doors shall be provided with neoprene gaskets. Each vertical panel structure shall contain a cable way alloy of adequate width with provision for suitable cable supports. The cable compartment shall have hinged door. There shall be a separate gland plate for each cable entry so that there will not be dislocation for already wired circuits when new feeders are added. The entire switch board shall be factory assembled conforming to IS:8623 and shall be made in the works of the switchgear manufacturer of approved make. The contractor shall get shop drawings approved by the consultant before undertaking manufacture of switchboards. The panel shall include the required number of MCCB aluminium bus bars, as per requirement and item of work. The units should be arranged in their formation to provide a compact switchboard having a pleasing appearance. The minimum depth of switch board shall be 300mm and the height be restricted to 2000mm. Steel sheet hinged lockable doors shall be duly interlocked with fuse switch unit to prevent opening of the panel when the switches is in 'ON' position. Safety interlocks shall be provided also. All the M.C.C. Bs shall be provided with vertical operation. The bus bars shall be positioned at top or side position. The bus bars shall be air insulated and made of high conductivity. High strength aluminium alloy of current density not less than 1 Amps/sq.mm complying with the requirements of glass E91E of IS: 5082 designed and shall uniform cross section throughout the length. The bus bars shall be held by especially polyester glass moulded (SMC) at sufficiently close intervals to prevent bus bar sag and to effectively withstand electromagnetic stresses in the event of a short circuit. All the bus bars and risers shall be fully insulated with PVC sleeving with necessary colour coding. High tensile bolts and spring washers shall be provided at all bus bars joints. Vertical bus bars for outgoing compartments shall run the full height of the panel to cater to all combinations of modules in a section.

All indicating instruments shall be of the flush mounting industrial pattern, conforming to the requirement of IS: 1248, indicating lamps shall be of the neon type. Separate compartment shall be provided for accommodating instruments, indicating lamps control contractor and fuses etc. There shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker, fuse switch units, but bars and connections. Horizontal wire way with screwed cover shall be provided at the top to take interconnecting control wiring between different vertical sections. Control

wiring shall be of copper conductor and shall be colour coded for easy identification of circuits. This should be of not less section than 2.5 sq.mm not more than two connections shall be made off any one terminal. All cables shall neatly bunch and shall be secured to wiring cradles. All outgoing cabled shall be fitted with identification ferrules at each end. Circuit diagram showing the arrangement of circuits shall be pasted on the inside of panel door and covered with transparent plastic sheet. Knockout holes of appropriate size and numbers shall be provided with panel in conformity with the location of incoming and outgoing cables/conduits. Facility shall be provided for termination of cables from both above and below the panel. Where cables enter from below, cable glands shall be fitted at the bottom and arranged in tiers to facilitate making connections to the upper and lower unit. Clamps shall be provided to support the weight of the cables. Aluminum flat of suitable size with two earthing cables eyes shall be provided for connections to main earth. The earth bar scale run within the base frame.

PART E

MODE OF MEASUREMENT

1.00 EARTHWORK

- 1.01** Earth work in excavation for foundation trenches of walls, retaining walls, retaining walls, footings of columns, steps, septic tank etc., including refilling (return filling) the quantity as necessary after completion of work, breaking clods in return filling, dressing, watering and ramming etc. and removal of surplus earth with all lead and lifts as directed and specified in following classifications of soils including bailing out water where necessary as directed and specified. (A) Up to a depth of 2.00m below the existing ground level. (a) In ordinary soil

MODE OF MEASUREMENT

- (i) Excavation works for foundations/footings shall be measured in length, breadth and depth, considering a 150 mm allowance on each side of footings in addition to the actual size of the footings. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) Excavation works for tie beams shall be measured in length, breadth and depth, considering a 150 mm allowance on each side of tie beams in addition to the actual size of the beams as specified in the drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

- 1.02** Extra lead per km truck carriage for excavated earth beyond the initial lead of 1 km.

MODE OF MEASUREMENT

- (i) The rate shall be for a unit of 1 cum.

- 1.03** Earth/ Sand filling in plinth in layer not more than 150mm thick including necessary, carriage, watering, ramming etc. complete as directed and specified including payment of land compensation, Forest Royalty, Sales Tax and other duties and taxes as may be necessary. (c) With silt (predominantly non plastic) by truck carriage including loading and unloading.

MODE OF MEASUREMENT

- (i) The volume of the compacted earth filling in plinth shall be measured in length, breadth and depth, after deducting the volume of brick work and RCC work in plinth (tie beams, plinth walls, bases of columns, etc.). The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 1.04** Shuttering and shoring the earth at different levels in foundations where necessary with required prop, struts, planks, timbers, nails etc. including dewatering if necessary, complete as directed and specified (measurement to be taken in the face area timbered) (b) Above 1.5 m up to 3.00 m depth

MODE OF MEASUREMENT

- (i) The quantity shall be measured in length and depth of the face area timbered. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 sqm.

2.00 SITE GRADING WORK

- 2.01** Excavation in Soil with Dozer with lead up to 100 me (Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment up to a distance of 100 m (average lead 50 m), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.

MODE OF MEASUREMENT

- (i) Surface excavation work shall be measured in length, breadth and depth (for site grading, road work, etc.) and will be considered from bench mark level to finished ground level indicated as per drawings. Original bench mark level will be permanently marked before starting any excavation work on the site. Surface excavations carried out by the contractor over and above the specified dimensions for ease of access, storage, access ramps, etc., shall not be calculated and no payment made for the same. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 2.02** Excavation in Ordinary Rock with Dozer with lead upto 100 metres (Excavation for roadway in ordinary rock by deploying a dozer, 80 HP including cutting and pushing the cut earth to site of embankment up to a distance of 100 metres (average lead 50 metres including trimming bottom and side slopes in accordance with requirements of lines,grades and cross sections.) (Provisional Item)

MODE OF MEASUREMENT

- (i) Surface excavation work shall be measured in length, breadth and depth (for site grading, road work, etc.) and will be considered from bench mark level to finished ground level indicated as per drawings. Original bench mark level will be permanently marked before starting any excavation work on the site. Surface excavations carried out by the contractor over and above the specified dimensions for ease of access, storage, access ramps, etc., shall not be calculated and no payment made for the same. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 2.03** Excavation in Hard Rock (requiring blasting) with disposal up to 100 m (Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads up to 100 m) (Provisional Item)

MODE OF MEASUREMENT

- (i) Surface excavation work shall be measured in length, breadth and depth (for site grading, road work, etc.) and will be considered from bench mark level to finished ground level indicated as per drawings. Original bench mark level will be permanently marked before starting any excavation work on the site. Surface excavations carried out by the contractor over and above the specified dimensions for ease of access, storage, access ramps, etc., shall not be calculated and no payment made for the same. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 2.04** Extra lead beyond initial lead of 100M.

MODE OF MEASUREMENT

- (i) The rate shall be for a unit of 1 cum.

3.00 PCC WORK

- 3.01** Plain cement concrete works with coarse aggregate, of sizes 13mm to 32mm in foundation bed for footing, steps, walls, brick works etc. as directed and specified including dewatering if necessary, and curing complete (Shuttering where necessary shall be measured and paid separately) (a) In prop. 1 cement: 3 sand: 6 coarse aggregate by volume.

MODE OF MEASUREMENT

- (i) PCC work shall be measured in length, breadth and depth, as specified in drawings or as directed. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 3.02** Plain cement concrete floor base in prop. 1:3:6 laid in alternate bays as specified with coarse agg. of size 13mm to 32mm including dewatering if necessary, and curing complete (ii) 50mm thick

MODE OF MEASUREMENT

- (i) PCC work shall be measured in length and breadth, as specified in drawings or as directed. The quantity will be calculated only for clear areas after deduction of areas covered by walls, columns, etc. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 sqm.

4.00 RCC WORK

Providing and laying plain/reinforced cement concrete works with coarse sand & 20mm down added stone aggregate including dewatering if necessary, and curing complete but excluding cost of form work and reinforcement for reinforced cement concrete work (form work and reinforcement will be measured and paid separately.) I) Using mixture machine

- 4.01** (A) In sub-structure up to plinth level. Foundation, footings, columns with base, tie and plinth beam, pile cap, base, slab, retaining walls, walls of septic tank, inspection pit and the like and other works not less than 100mm thick up to plinth level. N) Without using admixture, plasticizer
b) M20 or prop.1:1.5:3

MODE OF MEASUREMENT

- (i) RCC work shall be measured in length, breadth and depth, as specified in drawings or as directed. No deduction will be made for reinforcement. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

- 4.02** (B) In superstructure from plinth level to 1st floor level. ii) Columns, pillars, posts, struts, suspended floor, roof, landing, shelf and support, balcony, lintel, sill band, beam, girder, bressumer, cantilever, staircase (except spiral stair case and landing) including preparing the top surface and finishing of nosing. N) Without using admixture, plasticizer b) M20 or Prop. 1:1.5:3

MODE OF MEASUREMENT

- (i) RCC work shall be measured in length, breadth and depth, as specified in drawings or as directed. No deduction will be made for reinforcement. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 cum.

5.00 DPC WORK

- 5.01** Providing and laying 25mm thick damp proof course with cement concrete in prop 1:1.5:3 with graded stone agg. of 10mm down nominal size including providing approved damp proof admixture in proportion as recommended by the manufacturer including curing etc. complete as directed.

MODE OF MEASUREMENT

- (i) DPC work shall be measured in length and breadth as specified in drawings or as directed. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 sqm.

6.0 SHUTTERING AND FORM WORK

Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4.0m and removal of the same for in-situ reinforced concrete and plain concrete work in.

- 6.01** Foundation, footings, bases of columns, pile cap, raft and mass concrete works etc. (b) Using 25mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork shall be carried out in terms of length and depth. In measurement, the actual sizes of footings will be considered. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 sqm.

- 6.02** Columns, Pillars, Posts & Strut (a) Square, Rectangular, polygonal in plan or any shape like Tee/L etc. having plane vertical face (ii) Using 25mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork shall be carried out in terms of length and height. In measurement, the actual sizes of column sections will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (ii) The rate shall be for a unit of 1 sqm.

- 6.03** Sides and Soffits of Beams, beam haunchings, cantilever girders, bressumers, lintels and horizontal ties. (a) For depth not exceeding 1.0M. (ii) Using 25mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork for the main beams shall be carried out in terms of length and depth.
- (ii) No deduction shall be made from the formwork of columns. Formwork for secondary beams shall be measured up to the sides of main beams, but no deduction shall be made from the formwork of main beams at inner section points. No deduction shall be made from the form work of columns at the inner sections.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) The rate shall be for a unit of 1 sqm.

6.04 Flat Surfaces such as soffits of suspended floors, roofs, landings, cantilever slabs, chajjas, balconies and the like. (a) Floors etc. up to 200mm in thickness. (ii) Using 25mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork for slabs and flat surfaces shall be carried out in terms of length and breadth.
- (ii) No deduction shall be made for columns but the area of beam bottoms shall be deducted from the quantity of slab area.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) The rate shall be for a unit of 1 sqm.

6.05 Sides of tie beams, grade beams etc. at or below ground level. (b) Using 25mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork for the main beams shall be carried out in terms of length and depth.
- (ii) No deduction shall be made from the formwork of columns. Formwork for secondary beams shall be measured up to the sides of main beams, but no deduction shall be made from the formwork of main beams at inner section points. No deduction shall be made from the form work of columns at the inner sections.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) The rate shall be for a unit of 1 sqm.

6.06 Staircase with sloping or stepped soffits including risers and stringers but excluding Landing. (Using 38mm thick plank)

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork for the staircase shall be carried out in terms of length and breadth. For the inclined portion, the incline length shall be considered.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

- 6.07** Vertical surface such as walls (any thickness), parapet walls, partitions, walls of septic tank, inspection pit and the like including attached pilasters, buttresses, plinth and string courses and the like. (i) Using 38mm thick plank

MODE OF MEASUREMENT

- (i) The measurement of shuttering and formwork for vertical walls shall be carried out in terms of length and depth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

7.00 BRICK WORK

- 7.01** Providing brick soling in foundation and under floor with stone/best quality picked jhama bricks, sand packed and laid to level and in panel after preparing the sub-grade as directed including all labour and materials, and if necessary dewatering, complete. (a) Brick on flat soling

MODE OF MEASUREMENT

- (i) The measurement of brick soling shall be carried out in length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

- 7.02** Brick work in cement mortar with 1st class brick including racking out joints and curing complete as directed. (I) In Sub-structure up to plinth level including dewatering if necessary (a) In prop. 1:4 First class brick with non modular of class designation 7.5

MODE OF MEASUREMENT

- (i) The measurement of this item shall be taken for the brick masonry fully completed in foundation up to plinth. It shall be carried out in terms of length, breadth and depth. The limiting dimensions not exceeding those shown on the drawings or as directed shall be final. Battered, tapered and curved portions shall be measured net.
- (ii) No deduction shall be made from the quantity of brick work, nor any extra payment shall be made for embedding in masonry or making holes in respect of following items:
 - (1) End of joists beams, posts, girders, rafters, purlins, trusses, corbel, steps etc. where cross sectional area does not exceed 500 cm².
 - (2) Openings in walls, parapet and compound walls, not exceeding 1.0 sqm area.

- (3) Wall plates and bed plates, bearing of slabs, chhajjas and the like whose thickness does not exceed 10 cm. and the bearing does not extend to the full thickness of wall.
- (4) Drainage holes, recesses for cement concrete blocks to embed hold fasts for doors, windows, etc., forming toothings, grooves etc. and providing cramps for holding stone lining.
- (5) Iron fixtures, pipes up to 300 mm. dia.; holdfasts and doors and windows built into masonry and sanitary and water supply pipes, etc., for concealed electrical wiring and any other fixtures or inserts.
- (6) Forming chases of section not exceeding 350 cm² in masonry.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) The rate shall be for a unit of 1 cum.

7.03 (II) In superstructure above plinth level up to 1st floor level. (b) In proportion 1:4.(1 cement:4 sand) [First class brick with non modular of class designation 7.5]

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, breadth and depth. The masonry work above plinth level to floor two level shall be measured and paid under this item. Brick work in parapet shall be measured in the corresponding masonry item of storey immediately below the floor above which the parapet is built.
- (ii) No deduction shall be made from quantity of brick work, nor extra payment shall be made for embedding in masonry or making holes in respect of following items :
 - (1) Ends of joists, beams, posts, rafters, purlins trusses corbel, step etc. where cross sectional area does not exceed 500 cm².
 - (2) Openings in walls, parapet and compound walls, not exceeding 1000 cm². area.
 - (3) Wall plate, sand bed plates, bearing of slab, chhajjas and like whose thickness does not exceed 10 cm. and the bearing does not extend the full thickness of wall.
 - (4) Drainage holes, recesses for cement concrete blocks to embed hold fasts for doors, windows, etc., forming toothings, grooves etc. and providing cramps for holding stone lining.
 - (5) Iron fixture, pipes upto 300 mm. dia hold fasts of doors, and windows built into masonry and sanitary and water supply pipes etc., for concealed electrical wiring and any other fixtures or inserts.
 - (6) Forming chases of section not exceeding 350 cm². in masonry.

(7) Apertures for fire places, shall not be deducted nor shall extra labour required to make spraying of Jambs, throating and making trenches over the aperture be paid for separately.

- (iii) The rate shall include for work of any shape e.g. pillars, curved or tapered walls, drip courses, projections, parapets, load walls, sills, ottas, steps, tank walls, platform and counter walls, ducts, channels and mouldings like corbelling, pattas, etc.
- (iv) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (v) The rate shall be for a unit of 1 cum.

7.04 1st class brick nogged wall in cement mortar including racking out joints and curing complete as directed in super structure above plinth up to 1st floor level (protruding M.S rod/Tor steel of column to be embedded in cement mortar and will be measured and paid separately) (A) 112mm thick brick wall(a) In cement mortar in proportion 1:4 (1 cement:4 sand) [First class brick with non modular of class designation 7.5]

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and height.
- (ii) The half brick masonry work shall be measured under this item, the limiting dimensions shall not exceed those shown in the plan or as directed. Any work done extra over the specified dimensions shall not be measured and paid for.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) The rate shall be for a unit of 1 sqm.

7.05 Filling sunken floor with broken jhama brick bats and including compacting and supplying of materials complete as specified and directed for all levels.

MODE OF MEASUREMENT

- (i) The measurement length, breadth and depth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

7.06 Honey-comb brick work 112mm thick with common burnt clay bricks of class designation 7.5 in super structure above plinth level up to floor V level with cement mortar 1:4 (1 cement : 4 coarse sand). [First class brick with non modular of class designation 7.5]

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in sqm. The full area of honey-comb work shall be measured without deduction for openings.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

8.00 WOOD WORK

- 8.01** Providing wood work in frame (chowkaths) of doors, windows, clerestory windows and other similar works wrought, framed and fixed in position in contact with C.C or brick masonry wall including supplying, fitting and fixing with M.S. hold fast (40mmx3mmx250mm) as per design embedded in cement concrete block in proportion 1:2:4 and with two coats of kiricide oiling to the timber faces in contact with C.C and masonry as directed and specified. (a) With sal wood

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, width and depth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

9.00 DOOR WORK

- 9.01** Providing, fitting and fixing factory made Santro Flush door shutters having core & cross bands fabricated from seasoned 1st class timber, 25mm core battens, 2.5mm to 3.5mm uniformly thick cross bands, styles & rails made hinges, screws, bolts etc. as specified and from hardwood timber of width not less than 50mm, fixed to the door frames (chowkath) with necessary directed at all levels (Door fixtures and fittings to be measured and paid separately.) (b) 35mm thick

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken from outer edge to outer edge of the shutter.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

- 9.02** Supplying and installing uPVC- Casement Door made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC sections of wall thickness 2.4mm, multi chambered with corners fusion welded, fully reinforced with Galvanized steel 1.5/2mm including glazing

bead, folding gasket, glazing gasket, locking arrangement, Espag handle, Espag, keeper, drain cap, run up block, fisher screws, packing pieces with all stainless steel screws complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Fittings ROTO / GQ. Application of Silicon sealant from Inside / Outside of Dowcorning / GE. (b) Double leaf Side hung Door with a Dummy Mullion - French Door using uPVC section of size 58mm x 69mm x 2.4mm thick wall for frame, 58mm x 109mm x 2.4mm thick wall for glass sash, 58mm x 61mm x 2.4mm thick wall for dummy mullion, Aluminium threshold at bottom. (WINSTA KOMMERLING/ FINESTA/ ENCRAFT) i) Using 5mm clear glass

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken from outer edge of frame to outer edge of frame.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (i) The rate shall be for a unit of 1 sqm.

10.00 WINDOW WORK

Supplying and installing uPVC- Casement Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC sections of wall thickness 2.4mm, multichambered with corners fusion welded, fully reinforced with Galvanized steel 1.5/2mm including glazing bead, folding gasket, glazing gasket, friction stay, Espag handle, Espag, keeper, drain cap, run up block, fisher screws, packing pieces with all stainless steel screws complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system, fittings ROTO / GQ, application of Silicon sealant from Inside / Outside of Dowcorning / GE.

- 10.01** a) Single leaf Side hung Window using uPVC section of size 58mm x 57mm x 2.4mm thick wall for frame, 58mm x 68mm x 2.4mm thick wall for glass sash. With 5mm clear float glass (WINSTA KOMMERLING/ FINESTA/ ENCRAFT)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken from outer edge of frame to outer edge of frame.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

10.02 (f) ProVent openable Top hung Window using uPVC section of size 37mm x 43mm x 2.2mm thick wall for frame, 37mm x 56mm x 2.2mm thick wall for glass sash With 5mm clear float glass (WINSTA KOMMERLING/ FINESTA/ ENCRAFT)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken from outer edge of frame to outer edge of frame.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

10.03 Supplying and installing uPVC- Fixed Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.4mm with corners fusion welded, fully reinforced with galvanized steel 1.5/2mm including glazing bead, grooving bead, drain cap, fisher screws, packing pieces, necessary stainless steel screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Application of Silicon sealant from inside / outside of dowercornering / GE. With 5mm clear glass

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken from outer edge of frame to outer edge of frame.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

11.00 IRON AND STEEL WORK

11.01 Supplying, fitting and fixing in position reinforcement bars conforming to relevant I.S. Code for R.C.C. work/ R.B. walling including straightening, cleaning, cutting and bending to proper shapes and length as per details, supplying and binding with 20G annealed black wire and placing in position with proper blocks, supports, chairs, spacers etc. complete. (No extra measurement for lap, hook, chair, anchor etc. will be entertained in the measurement as they are included in the rate) (Upto 1st floor level) b) Other ISI approved TMT reinforcement bar (SAIL/JINDAL STEEL/SHYAM/SAI(For Assam Type Bldg., drain works, retaining wall & boundary wall etc.) (GRADE OF STEEL-Fe500)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and worked out in terms of unit weight. Lap length of reinforcement bars shall not be considered.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The following are the weights in kg/m for the respective diameter of rods.

6Ø 0.22 kg/m

8# 0.40 kg/m

10# 0.62 kg/m

12# 0.89 kg/m

16# 1.58 kg/m

20# 2.47 kg/m

- (iv) The rate shall be for a unit of 1 qtl.

11.02 Providing, fitting and fixing M.S. grill of required pattern for windows/ clerestory windows/ opening with M.S. flats at required spacing in frame all round, square or round M.S. bars with round headed bolts and nuts or screws. I. Plain grill (c) Fixed to Brickwork/P.C.C/R.C.C.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of weight and shall be calculated prior to installation.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No payment shall be made for the weight of screws, bolts, nuts, etc. Only the weight of the grill shall be paid for.
- (iv) The rate shall be for a unit of 1 kg.

12.00 FLOORING WORK

12.01 Providing and laying 60mm thick factory made cement concrete interlocking paver block of M - 30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No deductions shall be made nor extra paid for any opening up to 0.1 sqm in area in the floor. Nothing extra shall be paid for laying the floors at different levels in the same room or courtyard.
- (iv) The rate shall be for a unit of 1 sqm.

12.02 18 mm thick Marble stone slab flooring of sizes 1200x1200 including treads and risers of steps, skirting, laid over 20 mm thick base of cement plaster 1:6 (1 cement : 6 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing complete with marble slab of specified quality and shade at all levels. (i) Dungri slab

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall include all materials, labour and sundry involved in operations.
- (iv) The rate shall be for a unit of 1 sqm.

12.03 Kota-stone slab flooring of 18 mm thick over 20mm thick base of cement plaster 1:6 (1 cement : 6 coarse sand) laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete. (2) 600mm x 900mm and above

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No deductions shall be made nor extra paid for any opening in the floor area up to 0.1 sqm. Nothing extra shall be paid for the use of cut tiles or for laying the floors at different levels in the same room or courtyard. Kota slabs laid in floor borders, bands, etc shall be measured in the same item and nothing extra shall be payable on account of these or similar bands formed of half or multiples of half size standard tiles or other uncut tiles.

- (iv) The rate shall include all materials, labour and sundry involved in operations.
- (v) The rate shall be for a unit of 1 sqm.

12.04 Providing Ceramic Tiles of approved quality, size, shape and thickness not less than 8 mm on floors, skirtings, treads and risers of steps over cement mortar bed 15 mm thick in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with fix-A Tile Choksey/ Sika/ Pedelite/ Rouf/ White). cement slurry mixed with approved pigment to match the shade of granite slab, complete at all levels as specified and directed (coloured pigment should be in conformity with colour of slab and as approved and directed by the Department C) Delux range Somany/ Orient/Nitco/Qutone Make III) Of size 600mmx600mm and above

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (ii) The length and width of the flooring shall be measured between the faces of skirting or dado or plastered face of the walls as the case may be. The paving under dado or skirting shall not be measured.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) No deductions shall be made nor extra paid for any opening up to 0.1 sqm in area in the floor. Nothing extra shall be paid for laying the floors at different levels in the same room or courtyard. Dado will be measured from finish floor level to the top of the tile fixed.
- (v) The rate shall be for a unit of 1 sqm.

12.05 Providing polished ceramic wall tiles of approved quality, size, shape and thickness not less than 8mm on walls and skirtings over cement mortar bed 10 mm thick in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey / Sika / Pedelite / Rouf) /white cement slurry mixed with approved pigment to match shade of tiles complete at all levels as specified and directed. (Cement plastering to be measured and paid separately). (Coloured pigment should be in conformity with colour of tiles and as approved and directed by the Department). (Walls means both interior and exterior walls). c) Delux range Somany/ Orient/Nitco/Varmora Make i) Of size 200mmx400mm and above

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (ii) The length and width of the flooring shall be measured between the faces of skirting or dado or plastered face of the walls as the case may be. The paving under dado or skirting shall not be measured.

- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) No deductions shall be made nor extra paid for any opening up to 0.1 sqm in area in the floor. Nothing extra shall be paid for laying the floors at different levels in the same room or courtyard. Dado will be measured from finish floor level to the top of the tile fixed.
- (v) The rate shall be for a unit of 1 sqm.

12.06 Providing Antiskid Tiles of approved quality size, shape not less than 8mm on floor, skirting over a cement mortar bed 15mm thick of 1:3 (1 cement: 3 coarse sand) approved make fix with Fix-A-Tile (Choksey/Sika/Pedelite/Rouf)/ white cement complete at all level as specified and directed. VITRIFIED iii)Executive range-2 (Sizes 600 mm x600mm and above) i) Nitco made a). Imperia Series- Gres Tiles

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (ii) The length and width of the flooring shall be measured between the faces of skirting or dado or plastered face of the walls as the case may be. The paving under dado or skirting shall not be measured.
- (iii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iv) No deductions shall be made nor extra paid for any opening up to 0.1 sqm in area in the floor. Nothing extra shall be paid for laying the floors at different levels in the same room or courtyard. Dado will be measured from finish floor level to the top of the tile fixed.
- (v) The rate shall be for a unit of 1 sqm.

12.07 Providing polished granite slab of approved quality, size, shape and thickness not less than 18 mm on floors, skirtings, treads and risers of steps, Top kitchen platform, walls over cement mortar bed 15 mm thick in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with Fix-A-Tile Choksey/Sika/Pedelite/Rouf) /white cement slurry mixed with approved pigment to match the shade of granite slab, complete at all levels as specified and directed. (Cement plastering to be measured and paid separately). (Coloured pigment should be in conformity with colour of slab and as approved and directed by the Department). (iii) Deluxe Quality (ii) With White cement

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.

- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall include all materials, labour and sundry involved in operations.
- (iv) The rate shall be for a unit of 1 sqm.

12.08 Providing and fixing of granite single / double moulding (as per drawing) all complete.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and clear visible length shall be measured.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) Measurement shall be taken only once irrespective of the type of moulding (single/double).
- (iv) The rate shall be for a unit of 1 m

12.09 18 mm thick Marble stone slab Cladding of min sizes 1200x1200 including walls (around windows),treads and risers of steps, skirting, laid over 20 mm thick base of cement plaster 1:6 (1 cement : 6 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing complete with marble slab of specified quality and shade at all levels. (i) Dungri slab

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area and clear visible area shall be measured.
- (v) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (vi) The rate shall include all materials, labour and sundry involved in operations.
- (vii) The rate shall be for a unit of 1 sqm.

12.10 Providing and fixing of marble single / double moulding (as per drawing) all complete.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and clear visible length shall be measured.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.

- (iii) Measurement shall be taken only once irrespective of the type of moulding (single/double).
- (iv) The rate shall be for a unit of 1 m

13.00 PLASTERING WORK

13.01 10 mm thick Cement plaster in single coat on fair side of brick/concrete walls for interior plastering up to 1st floor level including arises or rounded angles not exceeding 80mm girth and finished even and smooth including curing complete as directed. b) In cement mortar 1:4

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall include for work at any height, position and floor, and for all necessary scaffolding, etc. as maybe required. The rate shall also include hacking, and/or bush hammering to form key for plaster and for spatter- treatment, as and when necessary. The rate shall also include all work in narrow width, arises, rounded angles, chamfered external angles, drip moulds, grooves and for making good after all trades. The rate shall also include grooves with cement finish up to 12 mm x 6 mm to be formed in plaster junctions of slab and beam and slab and brick, without any extra charge. The rate shall also include similar grooves and plaster at the junction of masonry and wood or steel door/ window/ ventilator frame or at the bottom of beams/lintels as drip moulds without extra charge.
- (iv) Thickness of plaster shall be exclusive of the thickness of the key, i.e., grooved or open joints in brickwork, stone work, etc.
- (v) Measurement of plastering shall be taken between the walls for length and from the top of floor or skirting to the ceiling for height. Dimensions shall be taken before plastering. Depth of cover of cornices, if any, shall be deducted.
- (vi) Soffits of stairs shall be measured as plastering on ceilings. Flowing/ folding soffits shall be measured separately.
- (vii) The rate shall be for a unit of 1 sqm.

13.02 15 mm thick Cement plaster in single coat on single or half brick wall for interior plastering up to 1st floor level including arises, internal rounded angles, not exceeding 80mm girth and finished even and smooth including curing complete as directed. A) On rough side b) In cement mortar 1:4

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall include for work at any height, position and floor, and for all necessary scaffolding, etc. as maybe required. The rate shall also include hacking, and/or bush hammering to form key for plaster and for spatter- treatment, as and when necessary. The rate shall also include all work in narrow width, arises, rounded angles, chamfered external angles, drip moulds, grooves and for making good after all trades. The rate shall also include grooves with cement finish up to 12 mm x 6 mm to be formed in plaster junctions of slab and beam and slab and brick, without any extra charge. The rate shall also include similar grooves and plaster at the junction of masonry and wood or steel door/ window/ ventilator frame or at the bottom of beams/lintels as drip moulds without extra charge.
- (iv) Thickness of plaster shall be exclusive of the thickness of the key, i.e., grooved or open joints in brickwork, stone work, etc.
- (v) Measurement of plastering shall be taken between the walls for length and from the top of floor or skirting to the ceiling for height. Dimensions shall be taken before plastering. Depth of cover of cornices, if any, shall be deducted.
- (vi) Soffits of stairs shall be measured as plastering on ceilings. Flowing/ folding soffits shall be measured separately.
- (vii) The rate shall be for a unit of 1 sqm.

13.03 Pointing on brick work with cement mortar including curing complete as directed. (Measurement shall be taken on surface area of the wall). A) Cement mortar prop. 1:3 b) Ruled pointing

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No deduction shall be made for end of joints, beams and posts, etc., for openings not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sill, etc., of these openings.
- (iv) Deductions for openings exceeding 0.5 sqm but not exceeding 3.0 sqm each, shall be paid as follows and no addition shall be made for reveals, jambs, soffits, sills, etc., of these openings.

- (a) When both faces of walls are pointed with same type of pointing deduction shall be made for one face only.
- (b) When two faces of walls are pointed with different type of pointing or if one face is plastered and the other is pointed, deduction shall be made in the plaster or pointing on the side of frame for doors, windows, etc., on which the width of reveals is less than that on the other side, but on the other side no deduction shall be made.

(v) The rate shall be for a unit of 1 sqm.

13.04 Neat cement punning

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

14.00 WALL PUTTY

14.01 Providing two coats of acrylic water based wall putty/ wall filler of Asian Paints/ Berger/ Dulux over concrete/ cement plaster/ brick walls and ceilings both internal and external after removing all the loosely adhering material from the wall/ ceiling surface with the help of emery stone, putty blade or wire brush, moistening the wall with the help of sufficient quantity of clear water as specified and directed by the department.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

15.00 PAINTING WORK

15.01 Wall painting (two coats) with Plastic emulsion paint approved brand and manufacture (Asian/Nerolac/Berger) on new surface to give an even shade after thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth. (a).Plastic Emulsion Paint of approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.

- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) All the work shall be measured net in this item as in place subject to the following limits unless otherwise stated hereinafter :
 - (a) Dimensions shall be measured to the nearest 0.01 m.
 - (b) Area in individual items shall be worked out to the nearest 0.01 sqm.
- (iv) All work shall be measured in sqm. No deductions shall be made for ends of joints, beams, posts, etc. and openings, not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams posts etc.
- (v) Deductions of opening exceeding 0.5 sqm but not exceeding 3.0 sqm each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings :
 - (a) When both the faces of walls are provided with same finish, deductions shall be made for one face only.
 - (b) When each face of is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deduction shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.
 - (c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.
- (vi) In case of opening of area exceeding 3.0 sqm each, deduction shall be made for openings but jambs, sills and soffits shall be measured.
- (vii) No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.
- (viii) Cornices and other wall features, when they are picked out in a different finish/colour shall be girthed and included in the general area.
- (ix) Item includes removing nails, making good holes, cracks, patches with materials similar in composition.
- (x) The rate includes cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above, carried out at all floor heights, in any

position, at all levels. This shall also include conveyance, delivery, handling, unloading, storing work etc.

- (i) The rate shall be for a unit of 1 sqm.

15.02 Finishing wall with two coats of acrylic emulsion exterior coatings of Unicem "Rakshak" brand of required shade by thinning 1ltr. of paint with 750ml of water to give an even shade after thoroughly brooming the surfaces to remove all dirt and remains of loose powdered materials as specified and directed by the department.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) All the work shall be measured net in this item as in place subject to the following limits unless otherwise stated hereinafter :
 - (a) Dimensions shall be measured to the nearest 0.01 m.
 - (b) Area in individual items shall be worked out to the nearest 0.01 sqm.
- (iv) All work shall be measured in sqm. No deductions shall be made for ends of joints, beams, posts, etc. and openings, not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams posts etc.
- (v) Deductions of opening exceeding 0.5 sqm but not exceeding 3.0 sqm each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings :
 - (a) When both the faces of walls are provided with same finish, deductions shall be made for one face only.
 - (b) When each face of is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deduction shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.
 - (c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.

- (vi) In case of opening of area exceeding 3.0 sqm each, deduction shall be made for openings but jambs, sills and soffits shall be measured.
- (vii) No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.
- (viii) Cornices and other wall features, when they are picked out in a different finish/colour shall be girthed and included in the general area.
- (ix) Item includes removing nails, making good holes, cracks, patches with materials similar in composition.
- (x) The rate includes cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above, carried out at all floor heights, in any position, at all levels. This shall also include conveyance, delivery, handling, unloading, storing work etc.
- (xi) The rate shall be for a unit of 1 sqm.

15.03 Supplying and laying of permanent wall finish for interior and exterior walls with surface coating of Heritage Surface Texture of Bakelite Hylam Limited for all types of buildings at all levels as specified and directed by the department. (a) Granules (Code : HGR)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) All the work shall be measured net in this item as in place subject to the following limits unless otherwise stated hereinafter :
 - (a) Dimensions shall be measured to the nearest 0.01 m.
 - (b) Area in individual items shall be worked out to the nearest 0.01 sqm.
- (iv) All work shall be measured in sqm. No deductions shall be made for ends of joints, beams, posts, etc. and openings, not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams posts etc.
- (v) Deductions of opening exceeding 0.5 sqm but not exceeding 3.0 sqm each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings:
 - (a) When both the faces of walls are provided with same finish, deductions shall be made for one face only.

- (b) When each face of is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deduction shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.
- (c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.
- (vi) In case of opening of area exceeding 3.0 sqm each, deduction shall be made for openings but jambs, sills and soffits shall be measured.
- (vii) No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.
- (viii) Cornices and other wall features, when they are picked out in a different finish/colour shall be girthed and included in the general area.
- (ix) Item includes removing nails, making good holes, cracks, patches with materials similar in composition.
- (x) The rate includes cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above, carried out at all floor heights, in any position, at all levels. This shall also include conveyance, delivery, handling, unloading, storing work etc.
- (xi) The rate shall be for a unit of 1 sqm.

15.04 Applying priming coat over new wood and wood based surfaces over 100mm in girth/width after and including preparing the surface by thoroughly cleaning oil, grease, dirt and other foreign matter, sand papering and knotting. (a) With ready mixed paint, wood primer (White)

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The relevant specifications shall be followed except that work done on new or other wood based surfaces shall be paid under this item.
- (iv) The rate shall be for a unit of 1 sqm.

- 15.05** Painting two coats (excluding priming coat) on new wood and wood based surface with enamel paint of approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac) to give an even shade including cleaning the surfaces of all dirt, dust and other foreign matter sand papering and stopping. (i).Surfaces over 100mm in width or girth. a). General purpose (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac).

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The relevant specifications shall be followed except that work done on new or other wood based surfaces shall be paid under this item.
- (iv) The rate shall be for a unit of 1 sqm.

- 15.06** Applying primary coat over new steel and other metal surface over 100mm in width or girth after preparing the surface by thoroughly cleaning oil, grease, dirt and other foreign matter and scoured with wire brushes, fine steels, wood scrapers and sand paper. (a) With ready mixed "red-lead/red oxide" primer.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The relevant specifications shall be followed except that work done on new or other steel based surfaces shall be paid under this item.
- (iv) The rate shall be for a unit of 1 sqm.

- 15.07** Painting two coats (excluding priming coat) on new steel and other metal surface with enamel paint of approved brand and manufacture (Asian paint/Berger paint/ ICI paint/J&N paint/ Nerolac) to give an even shade including cleaning the surface of all dirt, dust and other foreign matter. (i) Surfaces over 100mm in width/girth. (a) General purpose (Asian paint/Berger paint/ ICI paint/J& K paint/Nerolac).

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.

- (iii) The relevant specifications shall be followed except that work done on new or other steel based surfaces shall be paid under this item.
- (iv) The rate shall be for a unit of 1 sqm.

16.00 HARDWARE FITTINGS

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of items.
- (ii) The rate shall be for a unit of 1 no.

17.00 ROOFING WORK

- 17.01** Providing Pre Painted Galvalume Sheet Roofing (PPGL) at all levels including fitting and fixing self drilling, self tapping screws complete (Roof trusses, purlins etc. to be measured and paid separately.) TATA Blue scope/ Dyna roof / Durakolor /Wonder Roof as directed by the Department (iv) 0.60 mm thick

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No extra measurement shall be considered for lapping, etc.
- (iv) The rate shall be for a unit of 1 sqm.

- 17.02** Providing Pre Painted Galvalume Sheet (PPGL) accessories (Ridges / Valley / Gutter / Flashing) at all levels including fitting and fixing self drilling, self tapping screws complete. TATA Blue scope/ Dyna roof / Durakolor /Wonder Roof , as directed by the Department (iv) 0.60 mm thick

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No extra measurement shall be considered for lapping, etc.
- (iv) The rate shall be for a unit of 1 m.

- 17.03** Providing, fitting and fixing multi wall Polycarbonate panel system roofing sheet of 10mm thick, 600mm wide at all levels with self drilling, self tapping screws complete. The rate including frame works all complete.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No extra payment shall be made for the framework. For curved/inclined surface, total curve/inclined area of the surface shall be considered.
- (iv) The rate shall be for a unit of 1 sqm.

18.00 ROOF TRUSS

- 18.01 Providing, fitting, hoisting and fixing of roof trusses fabricated out of combination of any two or all of the following sections (i) Square section (ii) Rectangular Hollow section of specification RSH/SHS and (iii) M.S. circular hollow section of (iv) M.S. Angle Grade 210 including purlins, bottom runners and providing M.S. cleat, M.S. angle base plank, bolts and nuts with red oxide primer including fitting bottom runner and cleat etc. for fixing ceiling joist as per design complete as directed as per specifications. b) Using other ISI marked approved brand tube

MODE OF MEASUREMENT

- (i) All work shall be measured on the basis of finished dimensions, as fixed on site and measured net unless specified otherwise.
- (ii) The weight of steel sections, steel strips in finished works shall be calculated from standard weight on the same basis on which steel is supplied to the Contractor by the Institute or those given in relevant IS Codes, if steel is arranged by the contractor.
- (iii) Unless otherwise specified weight of cleats, brackets, packing pieces, bolts, nuts, washers, distance pieces, separators, diaphragm gusset (taking over all square dimension) fish plates etc. shall be added to the weight of respective items.
- (iv) In riveted work, allowance shall be made for weight of rivet heads. No deductions shall be made for rivet or bolt holes excluding holes for anchor or holding down bolts.
- (v) Dimensions other than cross sections and thickness of plates shall be measured to nearest 0.001m.
- (vi) Mill tolerance shall be ignored when weight is determined by calculation.
- (vii) The calculated quantity shall be worked out nearest up to two decimal places.
- (viii) The rate shall be for a unit of 1 sqm.

19.00 PLINTH PROTECTION AND SURFACE DRAIN

- 19.01 Providing plinth protection with bricks flat laid in cement mortar 1: 4 and finished with 15mm thick cement plaster in prop. 1:2 with a floating coat of neat cement finish.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

19.02 Providing drain with brick work in cement mortar in proportion 1:5 with half brick thick side walls and 100mm thick C.C (1:3:6) base over one brick flat soling including 15mm thick cement plastering in prop. 1:3 finished with a floating coat of cement slurry as directed with necessary shuttering for sides and earth work in excavation of foundation trenches and refilling the sides after completion of work etc. as specified. ii). 300mm wide and average 250mm deep with bed slope 1 in 150 with initial depth of 100mm.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

20.00 FALSE CEILING

20.01 Supplying, fitting, fixing and painting where necessary (one coat primer and two coats of paint) M/ F suspended ceiling which includes G.I. perimeter channels of size 0.55mm thick (having one flange of 20mm and another flange of 30mm and a web of 27mm) along with perimeter of ceiling, screw fixed to brick wall/ partition with the help of nylon sleeves and screws, at 610mm c/c. Then suspending G.I. intermediate channels of size 45mm (0.9mm thick with two equal flanges of 15mm each) from the soffit at 1220mm c/c with ceiling angle of width 5mm x 10mm x 0.55mm thick fixed to soffit with G.I. cleat and steel expansion fasteners. Ceiling section of 0.55mm thickness having knurled web of 51.5mm and two equal flanges of 26mm each with lips of 10.5mm are then fixed to the intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm c/c, 9.5mm/ 12.5mm Gypboard. False ceiling (Light Duty) with Metal Polyester Laminated Board on Back (MPL) (conforming to IS:2095-1982) is then screw fixed to ceiling section with 25mm long drywall screws at 230mm c/c. Screw fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally, the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the tapered and square edges of the boards with jointing compound, joint paper tape and two coats of drywall topcoat suitable for Gypboard complete at all levels as specified and directed. (For light fittings, providing opening for doors, window, ventilators etc., cut out made with frame of perimeter channel supported suitably to be measured and paid separately as and where necessary). (ii) 12.5mm MPL

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth. Measurement shall be taken of clear visible area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) Rates shall be inclusive of framework.
- (iv) The rate shall be for a unit of 1 sqm.

21.00 EAVESBOARD

- 21.01** Providing and fixing in position High Pressure Steam Cured Non Asbestos Fibre Cement Everest Heavy Duty Wall Board (Density>1500 Kg/m³) conforming IS 14862 & Type A as Eaves Board to be fixed on iron or timber Section as per the drawing directions of engineer-in-charge. Finally, if specified, the boards are to be painted with 2 coats of acrylic emulsion paint of approved shade/make over a coat of cement primer after installing it on to the concealed metal framework.
- ii) Using 12mm thick board of Everest make.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and width.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

22.00 WATER PROOFING TREATMENT

- 22.01** Cementitious Injection Grouting at R.C.C Boundary Walls, Underground Basement Walls, Lift Pit walls. Providing Grouting in R.C.C. walls by drilling holes @ 1M c/c upto the wall depth in zigzag manner or as per drawings using a drill machine and fixing a nozzle of 18 to 20mm dia. for injecting a grout slurry of cement, water and expanding grout admixture MasterFlow 150 of BASF India Ltd, a chloride & iron free, cementitious additive. The grout additive shall provide gaseous expansion up to 4% in plastic stage when added at a dosage of 0.5% by weight of cement @ 0.5% by weight of cement till the refusal of injected grout material from adjacent nozzle (grouting operation pressure shall be in between 2 to 4kg per sq.cm.). Followed by cutting the exposed nozzle so as to make the wall free from the grouting pipes and to seal the gap with polymer modified mortar as specified and directed by the Engineer In-charge.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of points.
- (ii) The rate shall be for a unit of 1 no.

22.02 Injection Grouting at the areas having Running Water Ingress Supply and application of Injection resin shall be MASTERSEAL 901, hydro-swelling, water based, low-viscous, thermo-setting resin based on vinyl metha-acrylate chemistry. The Injection resin shall have re-swelling capacity up to 2.5 times by volume in potable water and having viscosity < 40 cps at 20oC. The injection resin shall contain accelerator to regulate the setting times and shall not of expanding foaming type product or non-swelling formulation. The injection resin shall be effective in saline water by exhibiting positive expansion. After proper injection, all the nozzles to be cut and to be flushed with the surface.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of points.
- (ii) The rate shall be for a unit of 1 no.

22.03 WATERPROOFING treatment for Suken Slabs,Wet Area, Lift Pit walls over concrete Supply and application of MASTERSEAL 550, a two component reactive polymer composite. The product shall be applied in minimum two coats to achieve total DFT of 1mm. The product shall resist 7 bars pressure when tested as per DIN 1048 at 2mm DFT. The cured coating shall have the following diffusion co-efficient. Typical properties of the product shall be as follows:

Mixed Density : 1800 kg/m³

Mixing Ratio, by weight : 3:1 (powder: Liquid)

Pot Life : 120 Minutes at 25 0C

: 30 Minutes at 40oC

Recoatible : 8 – 12 Hours

% elongation : >5% (unbonded)

Abrasion Resistance,

(ASTM D4060, CS17 wheel) : 45 mg/1000 cycles

Water penetration

(DIN 1048) : 7 bars - no leakage

(at 2mm DFT)

TOP PROTECTION LAYER Over the waterproofing coating 12 mm thick plaster layer to be given to protect the coating.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.

- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

22.04 WATERPROOFING INTEGRAL WATERPROOFING COMPOUND for concrete of Retaining Wall, Wet Areas The liquid integral waterproofer shall be MasterPel 707, lignosulphonate polymer based, waterproofing cum plasticising admixture. The product shall comply with IS: 2645-2003 when tested at a dosage of 300 ml /100 Kg bag of cement. The product must be free of chlorides and shall have specific gravity not less than 1.17 and shall comply with TASTM C494 Type A & D. MasterPel 707 should be used in all structural concrete that is constantly or intermittently in contact with water such as sea walls, tunnels, basements, structural and pre-cast concrete in exposed superstructures. MasterPel 707 can also be used as waterproofing cum plasticising admixture for cement mortars and plasters.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of volume of concrete and worked out as per the following formula:

Quantity = V cum X 1.2 L/cum, where V = Volume of Concrete

- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 litre.

22.05 WATERPROOFING TREATMENT for Flat roof terrace. **SURFACE PREPARATION:** The cleaning and preparation of the substrate must be carried out thoroughly to leave a sound base for the application. Any oil, grease, rust, etc. present on the surface must be removed mechanically which otherwise may impair adhesion. Cracks shall be repaired and expansion joints shall be treated. **LIQUID, COLD-APPLIED PU ELASTOMERIC WATERPROOFING MEMBRANE SYSTEM.** Providing and applying MASTERSEAL HLM 5000 SL Horizontal, a single component the liquid, cold applied, elastomeric polyurethane based, that cures by reaction with atmospheric moisture to form a tough but flexible waterproofing membrane. It is elastomeric, seamless waterproof membrane applied in 2 coats to a DFT of 1.2 mm thick having an elongation capacity of over 600% and average tensile strength of 1 MPa, tear resistance as per GBT 19250-2003 >20N/m. The material shall comply to – ASTM C 836 National Std. of Canada 37.58 – M86 by CGSB

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length and breadth.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

22.06 Protection screed: providing and laying a separation layer of non-woven polypropylene geo-textile of 120 gsm over the entire surface of masterseal hlm 5000 sl, followed by a cement mortar screed of 50 mm thick over the geotextile. Concrete for screed to be done by client, geo-textile will be provided & placed by applicator. Geotextile sheet is must for pool deck area where soil/stone filling will follow, however in both areas masterseal hlm 5000 sl has to be protected by cement mortar.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, the actual sizes will be considered as per drawings. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

23.00 STONE MASONRY WORK

23.01 Stone masonry work in retaining wall, wing wall, abutment, foundation, steps, plinth etc. in cement mortar in prop 1:6 with leveling course of 1:6:12 with both faces hammer dressed including bonding, providing face stone, through stone and centering including racking of joints, curing and supplying and all carriage of stone as directed including payment of forest royalty and sales tax and carriage. (a) Random Rubble Masonry

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, width and height. Clear dimensions in case of length and height shall be taken. In case of width, the average of the widths at the top and bottom shall be considered.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

24.00 NON PRESSURE PIPE: (For Road Crossing)

24.01 Providing and laying non-pressure (light duty) 150mm dia RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1cement 2fine sand) including testing of joints etc complete

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

24.02 Providing and laying non-pressure (light duty) (300mm dia) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1cement 2fine sand) including testing of joints etc complete

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

24.03 Providing and laying non-pressure (light duty) (450mm dia) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1cement 2fine sand) including testing of joints etc complete.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

25.00 IRON GRATING

25.01 Providing, fitting and fixing M.S. grating of size 1200mm (max) x 450mm or as specified in the drawing for drain cover of required pattern with M.S. flats at required spacing in M.S. angle all round. The lifting arrangement should be provided as per drawing. The work shall be finished with two or more coats of enamel paint of approved make, over a coat of steel primer. All works shall be carried out as per drawings and as per direction of the Engineer-in charge.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of weight and shall be calculated prior to installation.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) No payment shall be made for the weight of screws, bolts, nuts, etc. Only the weight of the grill shall be paid for.
- (iv) The rate shall be for a unit of 1 kg.

26.00 C.I. MANHOLE COVER

26.01 Providing fitting and fixing 450mm dia 90mm thick C.I. Manhole cover and frame of 58kg. Weight complete as directed and specified.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of items.
- (ii) The rate shall be for a unit of 1 no.

27.00 ROAD WORK

27.01 Granular Sub-Base with Coarse Graded Material (Table:- 400- 2) (Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per cl. 401(with an initial lead of 5 Km.) (II) for grading-II Materials

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, breadth and depth.
- (ii) In measurement, clear dimensions of length and breadth shall be taken, but for depth, compacted dimension shall be considered. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

27.02 Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/binding material to fillup the interstices of coarse aggregate, watering and compacting to the reqd. density (with an initial lead of 5.0 km.) (B) By Mechanical Means: (i) Grading- I (a) Using Screening Crushable type such as Moorum or Gravel

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, breadth and depth.
- (ii) In measurement, clear dimensions of length and breadth shall be taken, but for depth, compacted dimension shall be considered. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

27.03 Providing, laying, spreading and compacting stone aggregates of specific sizes to WBM specification including spreading to uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, crushable screening to fill -up the interstices of coarse aggregate, watering and compacting to the required density Grading 2 as per technical specification Cl.405 By Mechanical means

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, breadth and depth.
- (ii) In measurement, clear dimensions of length and breadth shall be taken, but for depth, compacted dimension shall be considered. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

27.04 Providing, laying, spreading and compacting stone aggregates of specific sizes to WBM specification including spreading to uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, crushable screening to fill -up the interstices of coarse aggregate, watering and compacting to the required density(95% proctor density) Grading 3 as per technical specification Cl.405 By Mechanical means

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length, breadth and depth.
- (ii) In measurement, clear dimensions of length and breadth shall be taken, but for depth, compacted dimension shall be considered. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 cum.

27.05 Providing and applying prime coat with Bitumen emulsion (SS-1) on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.90-1.2kg/Sqm. Using mechanical means as per Technical Specification Clause 502. Medium Porosity

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, clear dimensions of length and breadth to be taken. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

27.06 Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at site and laboratory as directed by the deptt.)
(I)With Bitumen emulsion CSS-1h (c) Granular surfaces treated with primer

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.

- (ii) In measurement, clear dimensions of length and breadth to be taken. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

27.07 Open - Graded Premix Surfacing (Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen to required line, grade and level to serve as wearingcourse on a previously prepared base, including mixing in a suitable plant laying and rolling with a smooth wheeled roller 8-10 T capacity to the reqd. level and grade. (including carriage up to initial lead of 5.0 km from quarry and carriage of mixed materials up to 10.0 Km initial lead from mixing plant) (Including cost of testing of materials at site and laboratory as directed by the deptt.) A ' Without anti stripping agent II ' Mechanical method using CRMB 55 and HMP of appropriate capacity not less than 75 tonnes / hour .

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of area.
- (ii) In measurement, clear dimensions of length and breadth to be taken. The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 sqm.

28.00 SANITARY WORK

For Nos. 28.01, 28.02, 28.03, 28.04, 28.05, 28.06, 28.07, 28.08, 28.09, 28.10, 28.11, 28.12, 28.13, 28.14, 28.15, 28.16, 28.17, 28.18, 28.19, 28.20, 28.21:

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of items.
- (ii) The rate shall be for a unit of 1 no.

28.22 Providing and fixing Polythene - Aluminium - Polythene (PE-AL-PE) Composite Pressure pipes U.V. stabilised with carbon black conforming to ASTM F-1282-1995 for water supply including clamps at 1metre spacing , cutting & making good the walls etc. (A) Exposed on walls. Kitec Brand

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

- 28.23** Providing and fixing Polythene - Aluminium - Polythene (PE-AL-PE) Composite Pressure pipes U.V. stabilised with carbon black conforming to ASTM F-1282-1995 for water supply including clamps at 1 metre spacing, cutting & making good the walls etc. (B) Concealed pipe with cutting chases & making good the walls.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

- 28.24** PVC PIPES,BENDS,JUNCTIONS,TEES ETC. Supplying, fitting and fixing PVC pipes of 6 Kg/cm² (Supreme/Prince) or other ISI approved including joining ,fitting and fixing with clamps etc. as necessary complete at all levels including below G.L as directed and specified. a) In exposed surfaces or in trenches.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The calculated quantity shall be worked out nearest up to two decimal places.
- (iii) The rate shall be for a unit of 1 m.

- 28.25** Supplying and placing plastic cylindrical vertical closed top (PCVC) tank of Sintex / Polycon / Patton make over the staging with manhole cover with locking and cleaning arrangement including providing pads of size as required for inlet and outlet pipes (I) 2000 Lt capacity (a) Sintex make.

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of items.
- (ii) The rate shall be for a unit of 1 no.

ELECTRICAL WORKS

1. Electrical Fittings and Fixtures

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of number of items.
- (ii) The rate shall be for a unit of 1 no.
- (iii) The rate shall include the following:
 - (a) All fixing accessories, mounting brackets, ballast condensers and control gear.

- (b) Supplying and fixing ball and socket joints wherever required.
- (c) Earthing of fittings.
- (d) Electrical connection to fittings/ fans from the junction box/ceiling rose.
- (e) Installation and interconnection of electronic regulators for ceiling fans.

2. Electrical Wiring

MODE OF MEASUREMENT

- (i) The measurement shall be carried out in terms of length.
- (ii) The rate shall be for a unit of 1m.

PART F

CEMENT CONSUMPTION

SL. NO.	DESCRIPTION	RATIO	RATE		QUANTITY	UNIT	TOTAL QUANTITY
1.00	PCC Works	1:3:6	4.40	Bags/CuM	373.26	CuM	1642.34
2.00	PCC Works (Floor Base 50 mm Thick)	1:3:6	0.22	Bags/SqM	458.80	SqM	100.94
3.00	RCC Works	1:1.5:3	8.00	Bags/CuM	1461.71	CuM	11693.68
4.00	DPC Works	1:2:4	0.17	Bags/SqM	55.26	SqM	9.12
5.00	Brick Works						
5.01	Full Brick Works	1:4	2.00	Bags/CuM	134.44	CuM	268.88
5.02	Half Brick Works	1:4	0.21	Bags/SqM	1475.49	SqM	314.28
6.00	Flooring						
6.01	Marble/Granite Flooring	1:6	0.20	Bags/SqM	270.83	SqM	54.98
6.02	Kota Stone Flooring	1:6	0.24	Bags/SqM	857.71	SqM	205.85
6.03	Tile Works	1:3	0.21	Bags/SqM	221.57	SqM	46.53
7.00	Plastering						
7.01	10 mm Thick Plastering	1:4	0.09	Bags/SqM	2549.52	SqM	221.81
7.02	15 mm Thick Plastering	1:4	0.13	Bags/SqM	1914.94	SqM	250.86
7.03	Pointing Works	1:3	0.03	Bags/SqM	431.91	SqM	13.39
7.04	Cement Punning Works	1:3	0.33	Bags/SqM	63.16	SqM	20.91
8.01	Plinth Protection	1:3	0.35	Bags/SqM	34.52	SqM	12.08
8.02	Surface Drain	1:3:6	0.52	Bags/RM	57.00	RM	29.64
9.00	Random Rubble Masonry Works	1:6	1.70	Bags/CuM	409.25	CuM	695.73
Total							15581.00

PART G

MANDATORY TESTS

LIST OF MANDATORY TESTS FOR ROAD WORK:

1. WBM Grade II (Using Screening Type-B)
2. WBM Grade III (Using Screening Type-A)
3. Premix Carpeting (Using 13.2mm to 5.6mm aggregate)
4. CRMB – 55

Test should be carried out as per relevant IS Code.

LIST OF MANDATORY TESTS FOR CIVIL WORK:

S.N.	MATERIAL	TEST	FIELD / LABORATORY TEST	MINIMUM QTY. OF MATERIAL FOR CARRYING OUT THE TEST	FREQUENCY OF TESTING IF QTY. IS BEYOND THE MINIMUM QTY.	REFERENCE FOR TESTING / REQUIREMENTS
1.	Sand	Bulking of sand	Field	20 cum.	Every 20 cum. or part thereof or more frequently as decided by EIC	As per APWD specifications
		Silt Content	Field	20 cum.	Every 20 cum. or part thereof or more frequently as decided by EIC	As per APWD specifications
		Particle Size Distribution	Field	40 cum.	Every 40 cum. of fine aggregate / sand required in RCC work only.	As per APWD specifications
2.	Stone Aggregate	Percentage of soft or deleterious materials	General visual inspection, laboratory test wherever	As required by the EIC	For alternate quantities	IS:2386, Part-II, 1963

			required by the EIC or as specified			
		Particle Size Distribution	Field or Laboratory as required by EIC	45 cum.	For every 45 cum. or part thereof as decided by EIC	As per APWD specifications
		Ten Percent fine value	Laboratory	45 cum.	Initial test and subsequent test as and when required by EIC	As per APWD specifications
3.	Cement (OPC)	I. Consistency	Laboratory	1000 bags	One from each source / manufacturer or more frequently as decided by EIC	IS:8112, 43 Grade
		II. Strength	Laboratory			IS:12269, 53 Grade
4.	Steel for Reinforcement	I. Tensile Strength	Laboratory	20 MT	One from each source / manufacturer or more frequently as decided by EIC	IS:1608-1972
		II. Bend Test	Laboratory			IS:1599-1985
		III. Weight	Field / Lab.			
5.	(a) Water for Construction purposes	I. Chemical Properties	Laboratory	From each source	Before commencement of work and thereafter every three months till completion of work.	IS:3025-1986
		II. Physical Properties	Laboratory			
	(b) Water potability	I. Chemical Properties	Laboratory	From each source	As decided by EIC	IS:10500-1991
		II. Physical Properties	Laboratory			
6.	Cement Concrete or Reinforced Cement Concrete	Slump test	Field	15 cum.	15 cum. or part thereof or more frequently as required by EIC	As per APWD specifications
7.	Reinforced Cement Concrete (a) Nominal mix	Cube Test	Laboratory	(a) 20 cum. in slab, beams & connected columns	(a) Every 20 cum. of a day's concreting	IS:516-1956 & APWD specifications
8.	Brick / Brick	Testing of Bricks / Brick	Laboratory	2000 nos.	As per APWD	IS:3495-1976

	Tiles	Tiles for dimensions, compressive strength, water absorption and efflorescence			specifications	
9.	Timber	I. Moisture II. Bulk Density III. Species	Field (by moisture meter) or laboratory test as required by EIC	1 cum.	Every one cum. or part thereof	IS:287-1973 IS:1003-1004
10.	Flush Door	I. End Immersion Test II. Knife Test III. Adhesion test Thickness of anodic coating.	Laboratory	26 shutters	As per APWD specifications	IS:2202-1991 (Part-I & II)
11.	Aluminium door and window fittings	Thickness of anodic coating	Laboratory	If the cost of fittings exceed Rs.20,000/-	Rs.20,000/- or part thereof as required by EIC	IS:5523-1969

NOTE:

- (1) FOR MATERIALS BEARING “STANDARD MARK (ISI)”, MANDATORY TESTS ARE NOT REQUIRED, HOWEVER, IN CASE OF DOUBT, RANDOM TESTING MAY BE CARRIED OUT AS DECIDED BY EIC.
- (2) IN CASE OF ANY AMBIGUITY, APWD SPECIFICATIONS AND RELEVANT IS CODES SHALL TAKE PRECEDENCE.

PART H
LIST OF APPROVED MAKES

ROAD WORKS:

- | | |
|---------------------|---|
| 1. O.P/ P.P. Cement | : Top Cem/Vinay/ACC/Surya Gold/Star/
Max/CCI/Dalmia /Lafarge |
| 2. Bitumen | : IOCL/Hindustan Petroleum/ESSER/Shalimar |

CIVIL WORKS:

- | | |
|---|---|
| 5. Anodized Aluminum hardware fittings | : Everite, Hardwin, Ajit India, IPSA, Door set |
| 6. Water proofing compound | : SIKA/Pidilite/Choksi |
| 7. Bitumen | : Indian Oil / Hindustan petroleum |
| 8. PVC Piping / Fittings | : Supreme, Prince, SFMC, Ujjwal, Sheetal Bold |
| 9. Washable Distempering | : Asian paint, Berger Paint, ICI, Nerolac, J&N |
| 10. Water proofing Cement Paint | : Asian paint, Berger Paint, ICI, Unicem, J&N |
| 11. Synthetic Enamel Paint | : Asian paint, Berger Paint, Dulux, Nerolac, J&N |
| 12. Cement | : TopCem, Vinay, ACC, Calcom, CCI, Dalmia,
Lafarge, Star |
| 13. Reinforcement Bars | : TATA, SAIL, VIP, Satyam, Saiji, Shyam |
| 14. MS Angle, Plates | : TATA, SAIL, JSRM, Paras |
| 15. PE-AL-PE Composite Pipes | : Kitec, SFMC |
| 16. Factory Made Flush Door | : Green Ply, Century Ply, Archid Ply |
| 17. UPVC Door/Window Shutter with Frame | : Fenesta, Rehau |
| 18. Glass | : Modi, Saint Gobain, Asahi |
| 19. Ceramic Glazed Tiles | : Somany, Nitco, Asian, Orient, Regent |
| 20. Ceramic Anti-Skid Tiles | : Somany, Nitco, Asian, Orient, Regent |

21. Anti-Skid Vitrified Tiles	: Somany, Nitco, Asian, Orient, Regent
22. CP Plumbing Fixtures	: ESSCO, SONA, JAQUAR, Hindware
23. Locks	: Godrej, IPSA
24. Wall Putty	: JK, Birla
25. Sanitary Fitting	: Hindware, Parryware, Hindustan, Cera
26. Stainless Steel Sink	: Nirali, Jayana, Neel Kamal, Bath King
27. PVC Pipes	: Supreme, prince, SFMC, Ujjawal
28. Water Tanks	: Sintex, Qutone
29. Anti-Termite	: Chloropyriphos by Tricel / Lindane

ELECTRICAL WORKS:

1. Conduit Pipe (ISI Marked)	: PAYAL/Polypack/Berlia/Richa
2. Copper conductor cable (660 V grade)	: Finolex/Henley/Havells/Payal/HPL/L&T
3. Molded switch plate with switch boxes with ceiling fan electronic regulator	: MK (Honeywell)/Philips/Anchor/Crabtree/Legrand
4. Telephone Cable	: Henlay/Finolex/Payal
5. Metal clad socket	: Anchor-Riders/Havells
6. Distribution Boards with MCBS 9KA	: MDS/Schnider/Havells/HPL/L&T
7. Exhaust fan, ceiling fan	: Crompton/Usha/Havells/HPL
8. ELCB 100 MA	: MDS/Schnider/Havells/HPL
9. LDB	: Larsen & Turbo/Schnider/Havells/HPL
10. MCCB	: Larsen & Turbo/Schnider/Havells/HPL
11. L.T Switch Board	: Manufactures having CPRI certificate and approval of Consultant/BCPL
12. L.T Cables	: Crystal/Havells/Relisons
13. Luminaries	: Philips/GE/Crompton/Bajaj

- | | |
|---|--|
| 14. Automatic Light Switch | : Philips/Havells/Crompton/Bajaj |
| 15. Piano type switch & socket, plugtop | : MK (Honeywell)/Philips/Anchor/Crabtree/Legrand |
| 16. Geyser | : Bajaj/Venus/Racold/Ramson/Usha-Lexus |
| 17. TV Cable | : Henley/Finolex/Havells |

Section-9

List of Drawings – Drawings Separately Attached

Part-A	List of Architectural Drawings
Part-B	List of Structural Drawings
Part-C	List of Electrical Drawings

PART A: LIST OF ARCHITECTURAL DRAWINGS

Sl. No.	Drawing No.	Drawing Name
01	RAA/CPP-IPR/SITE/T/WD/101	Site Plan
02	RAA/CPP-IPR/CAN/T/WD/101	Ground Floor Plan
03	RAA/CPP-IPR/CAN/T/WD/102	Terrace Floor Plan
04	RAA/CPP-IPR/CAN/T/WD/103	Elevations
05	RAA/CPP-IPR/CAN/T/WD/104	Sections
06	RAA/CPP-IPR/CAN/T/WD/501A	Details of Doors & Windows

PART B: LIST OF STRUCTURAL DRAWINGS

Sl. No.	Drawing No.	Drawing Name
01	RAA/CPP-IPR/CAN/T/ST-301	Layout and Detail of Footing and Column
02	RAA/CPP-IPR/CAN/T/ST-302	Plinth Beam Detail at Level 1, Level 2 and Level 3
03	RAA/CPP-IPR/CAN/T/ST-303	Plinth Beam Detail at Level 4
04	RAA/CPP-IPR/CAN/T/ST-304	Plinth Beam Detail at Level 5
05	RAA/CPP-IPR/CAN/T/ST-305	Staircase Detail
06	RAA/CPP-IPR/CAN/T/ST-306	Layout of Post Plate Beam and Roof Beam
07	RAA/CPP-IPR/CAN/T/ST-307	Layout and Detail of Roof Slab
08	RAA/CPP-IPR/CAN/T/ST-308	Layout of Roof Truss
09	RAA/CPP-IPR/CAN/T/ST-309	Detail of Roof Truss
10	RAA/CPP-IPR/SITE/T/ST-301A	Detail of RCC Retaining Wall
11	RAA/CPP-IPR/SITE/T/ST-301B	Site Section showing Footing Levels

PART C: LIST OF ELECTRICAL DRAWINGS

Sl. No.	Drawing No.	Drawing Name
01	RAA/PPP-IPR/CAN/T/ELE/601A	Internal Electrical Layout for Ground Floor Plan
02	RAA/PPP-IPR/CAN/T/ELE/601B	Internal Electrical Layout for Terrace Floor Plan
03	RAA/PPP-IPR/CAN/T/ELE/602	Internal Electrical Circuit Diagram

SECTION – 10
TIME SCHEDULE FOR THE WORK

Separately Attached

SECTION - 11
TENDER DOCUMENT
PRICE BID
Separately Attached