प्लाज़्मा अनुसंधान संस्थान
Institute for Plasma Research

भाट, इंदिरा पुल के पास , गांधीनगर - 382 428
Bhat, Nr Indira Bridge,
Gandhinagar – 382 428. GUJARAT (INDIA)
Tel. : + 91 – 23962000
Fax : + 91 – 23962277

PART - II : TECHNICAL BID

काम का नाम
Name of work

आईपीआर परिसर, भाट, गांधीनगर में विविध सिविल कार्यों के लिए निविदा।

Tender for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar.

Tender Notice No: IPR/TN/CIVIL/2/2020 dated: 2.3.2020

दो बोली प्रणाली
Two Bid System

Address of Tender:	Chairperson, Infrastructure and Campus development committee, अध्यक्ष, अवसंरचना और कैम्पस विकास समिति
Inviting Authority	**INSTITUTE FOR PLASMA RESEARCH** **Near Indira Bridge,** **Bhat – Gandhinagar – Gujarat – 382428** **Contact Person: Mr. Prashant. Singh, Officer In-charge, e-Tender, IPR (E-mai id: etender.icdc@ipr.res.in)** **Telephone No. –079-2396 2000 – 2396 2069** **Fax No. -079 -2396 2277**

NOTE: In case of any conflict/contradiction between English and hindi version, English version will prevail.

INSTITUTE FOR PLASMA RESEARCH
NEAR INDIRA BRIDGE, BHAT, GANDHINAGAR – 382 428
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भाट, निकट इन्दीरा पुल, गांधीनगर - ३८२४२८, गुजरात (भारत)
Institute for **Plasma Research**
Bhat, Near Indira Bridge, Gandhinagar – 382428, Gujarat (INDIA)
Phone : +91-79-23962000, Fax: +91-79-23962277,
Web: http://www.ipr.res.in

SECTION – 1 (i) Tender Notice (Newspaper Advertisement)

INSTITUTE FOR PLASMA RESEARCH
Nr. Indira Bridge, Bhat, Gandhinagar – 382 428
Phone: 079-23962000, Fax: 079-23962277

Tender Notice No: IPR/TN/CIVIL/2/2020(Two Bid System) dated 2.3.2020:

निदेशक की ओर से अध्यक्ष, अवसंरचना और कैम्पस विकास समिति द्वारा ई-निविदा मोड के माध्यम से ऑनलाइन आइटम दर निविदाएं आमंत्रित की जाती हैं, प्लाज़्मा रिसर्च संस्थान, पास। इंदिरा ब्रिज, भाट, गांधीनगर - गुजरात - 382 428, दो बोलियों में, योग्य ठेकेदारों से निम्नलिखित कार्यों के लिए।

Online item rate tenders are invited through e-tendering mode by the Chairperson, Infrastructure and Campus development committee, on behalf of Director, Institute for Plasma Research, Nr. Indira Bridge, Bhat, Gandhinagar – Gujarat - 382 428**,** in two bids, from eligible contractors for the following works.

Name of Work	**Tender for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar**
Approx. Estimated Cost (Rs)	**43,37,830/-**
Completion Period	**110 Days (Including monsoon period, if any)**
Document available for view and downloading on website www.tenderwizard.com/DAE	**From 10:00 Hours on 4.3.2020 and Up to 17:00 Hours on 20.3.2020**

योग्यता मानदंड और निविदा दस्तावेज के साथ विस्तृत निविदा सूचना वेबसाइट www.tenderwizard.com/DAE पर मुफ्त दृश्य और डाउनलोड के लिए उपलब्ध है। ई-निविदा प्रक्रिया में भाग लेने के लिए, उपर्युक्त ई-निविदा पोर्टल पर पंजीकरण करना अनिवार्य है। इच्छुक एजेंसियों को प्रसंस्करण शुल्क और ईएमडी के साथ निर्दिष्ट तारीख को या उससे पहले निर्दिष्ट दस्तावेज़ों को स्कैन / भरना होगा।

Detailed tender notice along with Eligibility criteria and Tender Document is available on website **www.tenderwizard.com/DAE** for free view and downloading**.** To participate in e-tendering process, it is mandatory to get registered on the above e-tender portal. The interested agencies are required to scan/fill in and upload the specified documents along with processing fees and Earnest money deposit on or before the closing date.

निदेशक, आईपीआर किसी भी या सभी निविदाकारों के पूर्ण या हिस्से में निविदा को स्वीकार या अस्वीकार करने का अधिकार सुरक्षित रखता है या बिना किसी कारण बताए टोटो में निविदा रद्द करने का अधिकार सुरक्षित रखता है।

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

विस्तृत एनआईटी और निविदा दस्तावेज संस्थान के वेबसाइट http://www.ipr.res.in/documents/tenders.html पर संदर्भ उद्देश्य के लिए भी उपलब्ध हैं।

Detailed NIT & Tender Document are also available on the Institute's website http://www.ipr.res.in/documents/tenders.html for reference purpose only. For further information, Contact Person : Mr. Prashant Singh, Officer In-charge e-Tender, IPR email: etender.icdc@ipr.res.in Ph. No. 079-2396 2000 - 23962069

प्लाज़्मा अनुसंधान संस्थान
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Web: http://www.ipr.res.in

SECTION – 1 **(ii) Detailed Tender Notice**

भाग–ए: ऑनलाइन सबमिशन के लिए निर्देश
PART-A: INSTRUCTION FOR ONLINE SUBMISSION

1 डाउनलोड करने, अपलोड करने और मुफ्त दृश्य के लिए कदम–

1 Steps for downloading, uploading and free view-

संभावित बोलीदाता या सामान्य जनता वेबसाइट www.tenderwizard.com/DAE से निविदा दस्तावेजों के मुफ्त पीडीएफ प्रारूप को देख और डाउनलोड कर सकते हैं> डीएई के निविदा> प्लाज्मा अनुसंधान संस्थान, गांधीनगर
Prospective bidders or General public can see and download free of cost **PDF format** of the tender documents from website www.tenderwizard.com/DAE **>Tender Of DAE > Institute for plasma research, Gandhinagar.**

निविदा में भाग लेने के लिए, संभावित बोलीदाता से अनुरोध है कि उपयोगकर्ता आईडी / पासवर्ड / कक्षा III डिजिटल हस्ताक्षर प्रमाणपत्र के साथ वेबसाइट www.tenderwizard.com/DAE के होम पेज में लॉगिन के बाद एक्सेल प्रारूप डाउनलोड करें। आईपीआर / डीएई में ई-निविदा के लिए सेवाएं मैसर्स आईटीआई लिमिटेड, निविदा विज़ार्ड हेल्प डेस्क सेंटर, # 24, पहला मंजिल, सुधा कॉम्प्लेक्स, हवनूर सर्किल के पास, तीसरी चरण, चौथा ब्लॉक, बसेश्वरनगर, बैंगलोर द्वारा प्रदान की जाती है। - 560 07 9, पीएच: 91-80-40482000, टेलीफ़ैक्स: 91-80-40482114, ईमेल: daehelpdesk@gmail.com।

To participate in the tender, Prospective Bidder are requested to download the Excel formats, after login in the Home page of the website www.tenderwizard.com/DAE with User **id/ Password /Class III Digital Signature Certificate.** The services for e-tendering in IPR/DAE is provided by M/s ITI Ltd., Tender wizard Help Desk Centre, # 24, 1st Floor, Sudha Complex, Near Havanoor Circle, 3rd Stage, 4th Block, Basaveshwaranagar, Bangalore - 560 079, Ph:91-80-40482000, Telefax: 91-80-40482114, Email: daehelpdesk@gmail.com.

विशेष निविदा के एक्सेल प्रारूपों को डाउनलोड करने के लिए कदम :
Steps to Download the excel formats of particular tender:

a: लागू बटन पर क्लिक करें
a: Click on **UNAPPLIED** button

b: अनुरोध बटन पर क्लिक करें
b: Click on **REQUEST** button

c: इलेक्ट्रॉनिक मोड के माध्यम से ई–भुगतान के माध्यम से ऑनलाइन निविदा प्रसंस्करण शुल्क का भुगतान करें।
c: Pay Tender Processing fee online via e-payment through electronic mode

d: बटन पर क्लिक करें .
d: Click on **SUBMIT** button,

e: इन प्रोग्रेस बटन पर क्लिक करें (स्टेटस कॉलम बोलीदाता को निविदा के रूप में प्राप्त किया जाएगा)
e: Click on **INPROGRESS** button (In status column bidder will find the tender as **RECEIVED**)

f: बोलीदाता जमा करने की अंतिम तारीख तक किसी भी समय के लिए अनुलग्नक बटन संपादित करके आवश्यक निविदा दस्तावेज डाउनलोड करने में सक्षम हो जाएगा।
f: Bidder will be able to download required Tender Documents by clicking **EDIT attachment** button for any number of times till last date of submission.

1 संभावित बोलीदाता को एक्सेल दस्तावेज़ भरना होगा और इसे नामित किए बिना अपलोड करना होगा। कृपया निविदा जमा करने के लिए सहायता पुस्तिका देखें या आईटीआई हेल्पडेस्क से संपर्क करें।
1 Prospective Bidder has to fill Excel Documents and upload the same without renaming it. Please refer Help Manual for Tender submission or contact ITI Helpdesk.

2 इच्छुक बोलीदाता को निविदा और सावधानी मानदंडों को ध्यान से आमंत्रित करने वाले नोटिस में नियम और शर्तें पढ़नी चाहिए। अगर वह खुद को योग्य मानता है तो उसे केवल अपनी बोली जमा करनी चाहिए और वह आवश्यक सभी दस्तावेजों के कब्जे में है।

2 The intending bidder must read the terms and conditions in the notice inviting tender & prequalification criteria carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

3 बोली जमा करने का मतलब बोलीदाता द्वारा Form "I". के रूप में संलग्न प्रारूप के अनुसार ऑनलाइन प्रस्तुत किए जाने वाले उपक्रम की स्वीकृति होगी।

3 Submission of bid shall mean acceptance of undertaking to be furnished online by bidder as per format enclosed as Form "I".

4 वेबसाइट पर पोस्ट बोलीदाताओं के लिए सूचना और निर्देश निविदा दस्तावेज का हिस्सा बनेंगे। आवश्यक प्रसंस्करण शुल्क का भुगतान करने के बाद निविदा डाउनलोड और अपलोड करने के लिए केवल www.tenderwizard.com/DAE पर अपलोड किया जाना है।

4 Information and Instructions for bidders posted on website shall form part of tender document. The tender is to be downloaded and uploaded only on www.tenderwizard.com/DAE after paying requisite processing fee.

5. बोली केवल अनिवार्य स्कैन किए गए दस्तावेजों को अपलोड करने के बाद ही प्रस्तुत की जा सकती है, "आईटीआई लिमिटेड, नई दिल्ली" के पक्ष में प्रसंस्करण शुल्क का भुगतान, आईपीआर के पक्ष में ईएमडी और निर्दिष्ट अन्य दस्तावेज। किसी भी मामले में प्रसंस्करण शुल्क वापस नहीं किया जाएगा।

5. The bid can only be submitted after uploading the mandatory scanned documents, payment of processing fee in favour of **"ITI LIMITED, NEW DELHI"**, Earnest Money Deposit in favour of IPR and other documents as specified. Processing fee shall not be refunded in any case.

6. बोलियां जमा करने के बाद ठेकेदार किसी भी समय संशोधित बोली को फिर से जमा कर सकता है लेकिन अधिसूचित किए गए बोली के ऑनलाइन जमा करने की तिथि निर्धारित करने की तारीख से पहले। बोलीदाता निर्धारित जमा तिथि और ऑनलाइन जमा करने के समय से पहले बोली वापस ले सकता है। लेकिन, जब बोलीदाता बोली वापस ले लेता है, तो उसे पुनः सबमिट नहीं किया जा सकता है।

   देय तिथि और समय के बाद निविदा दस्तावेज जमा करने की अनुमति नहीं दी जाएगी। ई-टेंडरिंग पोर्टल पर प्रदर्शित होने वाला समय बोलीदाता पर अंतिम और बाध्यकारी होगा।

6. After submitting bids the contractor can re-submit revised bid any number of times but before stipulated closing time and date of online submission of bid as notified. The bidder can withdraw the bid before stipulated closing date and time of online submission. But, once the bidder withdraws the bid, it cannot be resubmitted.

   Submission of the tender document after the due date and time shall not be permitted. Time being displayed on e-tendering portal shall be final and binding on the Bidder.

7. ठेकेदारों, जो www.tenderwizard.com/DAE वेबसाइट पर नामांकित नहीं हैं, को नामांकन प्राप्त करने की आवश्यकता है।

7. The contractors, who are not enrolled on www.tenderwizard.com/DAE website, are required to get enrolled.

8. इच्छुक बोली लगाने वाले को बोली जमा करने के लिए वैध कक्षा -3 डिजिटल हस्ताक्षर होना चाहिए।

8. The intending bidder must have valid class-III digital signature to submit the bid.

9. ठेकेदार को प्रत्येक आइटम की दर उद्धृत करना सुनिश्चित करना चाहिए। आंकड़ों में उद्धरण दर के लिए कॉलम का मतलब येलो रंग में दिखाई देता है और पल दर दर्ज की जाती है, यह स्काई ब्लू हो जाती है। इसके अलावा, किसी भी कोशिका का चयन करते समय एक चेतावनी प्रकट होती है कि यदि कोई भी सेल खाली छोड़ दिया जाता है तो उसे "0" के रूप में माना जाएगा। इसलिए, यदि कोई सेल खाली छोड़ दिया गया है और बोली लगाने वाले द्वारा कोई दर उद्धृत नहीं की जाती है, तो इस तरह की वस्तु की दर को "0" (शून्य) के रूप में माना जाएगा। बोली लगाने वाले को विनिर्देशों, मात्रा बिल और GCC प्रावधानों के अनुसार शून्य की उद्धृत दर पर ऐसी वस्तुओं को ज़िक्र करना होगा।

9. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in **YELLOW** colour and the moment rate is entered, it turns **SKY BLUE**. In addition to this, while selecting any of the cells a warning appears that **if any cell is left blank the same shall be treated as "0".** Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO). The bidder shall be required to execute such items at his quoted rate of zero as per specifications, bill of quantity and GCC provisions.

10. निविदा प्रसंस्करण शुल्क के सफल ई–भुगतान पर, बोलीदाता ई–निविदा पोर्टल से निविदा दस्तावेज (एक्सेल शीट्स सहित, यदि कोई हो) डाउनलोड कर सकते हैं। बोलीदाताओं को ई–टेंडरिंग पोर्टल से केवल अंतिम तिथि और समय से पहले प्रसंस्करण शुल्क की ओर ई–भुगतान का विवरण अपलोड करना होगा और अन्यथा निविदा

दस्तावेज (एक्सेल शीट्स सहित, यदि कोई हो) डाउनलोड करें, अन्यथा, यह संभव नहीं होगा उन्हें ई–निविदा पोर्टल पर ई–निविदा दस्तावेज अपलोड करने के लिए।

ध्यान दें: ऊपर दिए गए भुगतान विवरण की पुष्टि किए बिना निविदा दस्तावेज (एक्सेल शीट्स सहित, यदि कोई हो) डाउनलोड करना ई–निविदा पोर्टल वैध नहीं होगा और संक्षेप में अस्वीकार कर दिया जाएगा।

बोलीदाताओं को सलाह दी जाती है कि सर्वर पर अंतिम मिनटों या अपलोड करने में जटिलताओं से बचने के लिए समय पर अपने दस्तावेजों को अच्छी तरह से अपलोड करें। किसी भी मामले में आईपीआर दस्तावेजों को अपलोड करने में किसी भी प्रकार की समस्या के लिए ज़िम्मेदार नहीं होगा।

10. On successful e-payment of tender processing fees, the Bidders can download the tender document (including Excel sheets, if any) from the e-tendering portal. The Bidders have to upload the details of e-payment towards processing fees, before the last date & time and download the tender documents (including Excel sheets, if any) from the e-tendering portal only, otherwise, it will not be possible for them to upload the e-tender documents on the e-tendering portal.

    Note: Downloading the tender documents (including Excel sheets, if any) without confirmation of payment details on above e-tendering portal shall not be valid and rejected summarily.

    Bidders are advised to upload their documents well in time, to avoid last minutes rush on the server or complications in uploading. IPR, in any case, will not be responsible for any type of problem in uploading the documents.

11. बोलीदाता अपने ईमेल और बैंक खाते को सक्रिय रखने और परिवर्तन के मामले में अपनी प्रोफ़ाइल को अपडेट करने के लिए पूरी तरह उत्तरदायी होते हैं। यह आवश्यक है क्योंकि संचार संस्थान द्वारा ई–मेल द्वारा अधिमानतः किया जाएगा। इसके अलावा, ई–निविदा पोर्टल द्वारा सभी ऑटो जेनरेट किए गए मेल इस ई–मेल पते पर भेजे जाएंगे।

11. The bidders are solely responsible to keep their email and bank account active and to update their profile in case of change. This is essential as communication shall preferably be done by e- mail by Institute. Moreover, all the auto generated mail by e-tendering portal shall be sent on this e-mail address.

12. ठेकेदार JPG प्रारूप और PDF प्रारूप के रूप में दस्तावेज़ अपलोड कर सकते हैं।

12. Contractor can upload documents in the form of JPG format and PDF format.

13. बोलीदाताओं को सलाह दी जाती है कि वे अपने स्वयं के लाभ के लिए निविदा प्रसंस्करण शुल्क के ऑनलाइन भुगतान को सुविधाजनक बनाने के लिए कोर बैंकिंग समाधान शाखा (with NEFT / RTGS) के साथ बैंक खाता खोलें।

13. Bidders are advised to open bank account with core banking solution branch (with NEFT / RTGS) in order to facilitate online payment of tender processing fee for their own benefit.

14. विस्तृत एनआईटी और तकनीकी बोली समझौते का हिस्सा होगी। यदि किसी भी स्तर पर बोलीदाता इसे स्वीकार करने से इंकार कर देता है, तो बोली खारिज कर दी जाएगी और ईएमडी जब्त कर दी जाएगी। आगे अनुशासनात्मक कार्रवाई भी शामिल की जा सकती है।

14. The detailed NIT and Technical bid shall be part of agreement. If the bidder at any stage refuses to accept the same, the bid shall be rejected and Earnest Money Deposit shall be forfeited. Further disciplinary action is liable to be taken including.

15. निविदा दस्तावेज जमा करने में किसी भी समस्या के मामले में, बोलीदाता को सहायता डेस्क की सहायता हो सकती है या उस वेबसाइट या मोबाइल पर दिए गए सहायता पुस्तिका का उपयोग कर सकते हैं और कहीं और उल्लिखित ई-मेल का उपयोग किया जा सकता है।

15. In case of any problem with the submission of the tender document, the Bidder may have the assistance of help desk or use the help manual given on the said website or mobile and e-mail mentioned elsewhere.

16. निविदा ऑनलाइन जमा की जाएगी| इसे जमा करने का कोई अन्य तरीका स्वीकार्य नहीं है |

16. The tender shall be submitted online. No other mode of submission is acceptable.

17. नियत तारीख और समय के बाद निविदा प्रस्तुत करने की अनुमति नहीं दी जाएगी। ई-टेंडरिंग पोर्टल पर प्रदर्शित किया जा रहा समय आवेदक के लिए अंतिम और बाध्यकारी होगा |

17. Submission of the Tender after the due date and time shall not be permitted. Time being displayed on e-tendering portal shall be final and binding on the applicant.

18. खोलने पर, बोलीदाता अपनी बोली स्थिति देख सकते हैं। बोली के उद्घाटन के दौरान बोलीदाता के अधिकृत प्रतिनिधि उपस्थित रह सकते हैं (यदि ऐसी इच्छा हो तो)। अधिकृत प्रतिनिधि के पास उनकी कंपनी के सक्षम प्राधिकारी द्वारा जारी वैध फोटो पहचान और मूल अधिकार पत्र होना चाहिए।

18. On opening, the Bidders can see their bid status. The authorized representative of Bidders may remain present (if so desires) during opening of Bid. The authorized representative should have valid photo identity and original authority letter issued by competent authority of their company.

18. ई–टेंडरिंग संबंधित प्रश्नों / सेवाओं के लिए हेल्प डेस्क–

a) **मेसर्स आईटीआई के प्रतिनिधि**,

श्री सुनील के पटेल, **मोबाइल नंबर** 09624981992

ई-मेल : twhelpdesk426@gmail.com,

daehelpdesk@tenderwizard.co.in,

nodalofficer.et@ipr.res.in

b) अखिल भारतीय हेल्प लाइन नंबर: 91-80-40482000,

ई-मेल: daehelpdesk@tenderwizard.co.in

सभी कार्य दिवसों पर सुबह 10.00 बजे से शाम 6 बजे तक।

19. Help Desk for e-tendering related queries /services-

a) Representative of M/s ITI
Shri Sunil K Patel
Mobile No. 09624981992

e-mail : twhelpdesk426@gmail.com,
daehelpdesk@tenderwizard.co.in
nodalofficer.et@ipr.res.in
b) All India Help line No: 91-80-40482000,
e-mail: daehelpdesk@tenderwizard.co.in
From 10.00 AM to 6.00 PM on all working days.

20. आईपीआर किसी भी आवेदन के बिना किसी भी आवेदन को स्वीकार या अस्वीकार करने का अधिकार सुरक्षित रखता है। किसी भी शर्त के साथ आवेदन तुरंत अस्वीकार कर दिया जाएगा।

20. Institute reserves the right to accept or reject the tender(s) in fill or in part, without assigning any reason thereof. Tenders with any conditions including conditional rebate shall be rejected forthwith.

भाग–बी: निविदा सूचना विवरण
PART-B: TENDER NOTICE DETAILS

Tender Notice No: IPR/TN/CIVIL/2/2020(Two Bid System) dated 23.2.2020:

आईपीआर परिसर, भाट, गांधीनगर में विविध सिविल कार्यों के लिए निविदा सूचना।

Tender notice for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar

निदेशक की ओर से अध्यक्ष, अवसंरचना और कैम्पस विकास समिति द्वारा ई–निविदा मोड के माध्यम से ऑनलाइन आइटम दर निविदाएं आमंत्रित की जाती हैं, प्लाज़्मा रिसर्च संस्थान, पास। इंदिरा ब्रिज, भाट, गांधीनगर – गुजरात – 382 428, दो बोलियों में, योग्य ठेकेदारों से निम्नलिखित कार्यों के लिए।
Online item rate tenders are invited through e-tendering mode by the Chairperson, Infrastructure and Campus development committee, on behalf of Director, Institute for Plasma Research, **Nr. Indira Bridge, Bhat, Gandhinagar – Gujarat - 382 428,** in two bids, from eligible contractors for the following works.

1	NIT No.	**IPR/TN/CIVIL/2/2020 dated 2.3.2020**
2	Name of work	**Tender for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar**
3	Estimated cost of Construction works (Rs)	**Rs 43,37,830/-**
4	Earnest Money Deposit (EMD)	EMD of **Rs 86,757/-(Rupees eighty six thousand seven hundred fifty seven only)** to be submitted in the form of **Demand Draft / Pay order / Fixed Deposit Receipt issued by Scheduled banks** in favour of **Institute For Plasma Research , Bhat, Gandhinagar- 382428** **Note:** 1) EMD in the form of cheque will not be accepted. The bid can only be submitted after uploading the scanned copy of EMD Documents and original should be deposited in office of Tender Inviting Authority within the period of bid submission as mentioned. **Bids received without requisite EMD shall be summarily rejected.**
5	Completion period	**110 Days(Including monsoon period, if any)**
6	Fee of Tender Document	**NIL**
7	Tender Processing Fee	**Rs 2560/-** should be paid only by e-payment through electronic mode to M/S ITI Limited
8	Performance Guarantee	**5% of Tendered Value to be provided upon issue of Letter of Acceptance and before placing Work Order**
9	Availability of Tender Documents for view and download **on website** **www.tenderwizard.com/DAE**	**From 10:00 Hours on 4.3.2020 and Up to 17:00 Hours on 20.3.2020**

10	Site Visit, if any	Site visit by Agencies (if any) – up to 17:00 Hours on **27.3.2020.** Contact officer Mr. Prashant Singh, officer in-charge, e-tender, Institute for Plasma Research, Near Indira Bridge, Bhat, Gandhinagar -382428. Preferably by email: etender.icdc@ipr.res.in or through Tel No:-079-2396 2000, 2396 2069
11	Seeking pre-bid clarification on Tender document	The applicant can seek clarifications regarding Tender document up to **17:00 Hours on 3.4.2020** by uploading their queries on website**www.tenderwizard.com/DAE.** The clarifications will be uploaded on the same web portal by **17:00 Hours on 10.4.2020.**
12	Last date and time of closing of online submission of tenders	**29.4.2020 up to 13:00 Hours**
13	Last date for submission of Original Instrument (DD, etc.) towards EMD.	On or before **13:00 Hours on 29.4.2020** in the Office of Mr. Prashant. Singh, Officer In-charge e-Tender, Institute for Plasma Research, Near Indira Bridge, Bhat, Gandhinagar -382428 Phone no. 079 2396 2000 – 2396 2069
14	Date and time of online opening of Technical Bid.	**On 29.4.2020 at 14:30 Hours** **Tender will be opened at Institute for Plasma Research**, Near Indira Bridge, Bhat, Gandhinagar -382428 at the stipulated date and time above
15	Date of opening of Financial Bids of qualified bidders	Will be notified at a later date.
16	Help Desk for e-tendering related queries /services	a) Representative of M/s. ITI Shri. Sunil K Patel Mobile No. 09624981992 e-mail : twhelpdesk426@gmail.com, daehelpdesk@tenderwizard.co.in nodalofficer.et@ipr.res.in b) All India Help line No: 91-80-40482000, e-mail: daehelpdesk@tenderwizard.co.in From 10.00 AM to 6.00 PM on all working days.

भाग–सी: आवश्यकताएं और योग्यता CRITERIA
PART-C: REQUIREMENTS AND ELIGIBILTY CRITERIA

बोलीदाता, जो स्वयं की निम्नलिखित आवश्यकताओं को पूरा करते हैं, केवल आवेदन करने के लिए पात्र होंगे। संयुक्त उद्यम स्वीकार नहीं किए जाते हैं।
The Bidders, who fulfill the following requirements on their own, shall only be eligible to apply. Joint ventures are not accepted.

Sr. No.	Eligibility Criteria	Documentary proof for the eligibility (To be Scanned and Uploaded) Note: The applicants are requested to fill up the facts & figure in the prescribed format. Simply filling like Yes or No shall not be accepted.
1.	Should have satisfactorily completed similar works during the seven years ending previous day of last day of submission of tender, of value as below **(i)** Three similar works each costing not less than Rs 17.35 in Lacs **or** (ii) Two similar works each costing not less than Rs 26.03 in Lacs **or** (iii) One similar work costing not less than Rs 34.70 in Lacs. Similar means civil construction works for buildings. Note: The value of executed works shall be brought to current costing level by enhancing the actual value of works at simple rate of 7% per annum; calculated from the date of completion to previous day of last day of submission of tenders.	Work orders and Completion certificates issued by the authority concerned Documentary Proof: 1. Work Orders & Completion certificate for qualifying completed work(s) issued by Engineer-in-Charge or Owner should be attached. 2. Completion certificates for works issued by Private parties shall be supported by TDS (Tax deducted at Source) Certificates.
2.	Should have had average annual turnover of Rs 21.69 in lacs on construction work during the last three consecutive years ending 31st March, 2019. Note: Year in which no turnover is shown would also be considered for working out the average.	Annexure -Form "A": Financial information, Chartered Accountant certificate for the Annual financial turnover showing Profit & Loss as submitted to Income Tax Department. **Note:** Balance sheet duly audited by chartered accountant to be submitted.
3	Should not have incurred any loss (profit after tax should be positive) in more than two years during the last five consecutive years ending on 31st March, 2019.	Annexure -Form "A": Financial information, Chartered Accountant certificate for the Annual financial turnover showing Profit & Loss as submitted to Income Tax Department.

		Note: Balance sheet duly audited by chartered accountant to be submitted.
4.	Should have solvency of Rs 17.35 in Lacs issued by Bank.	Annexure Form "B"- Form of Bankers Certificate from a Bank
5.	Proof of registration with Government / Semi Government organizations / Statutory Bodies / reputed organization like CPWD, MES, BSNL**,** Railways, State PWDs etc. in appropriate class OR having experience in execution of similar nature of works with corporate / PSU / Banks etc.	Registration certificate in appropriate class OR Work order / completion certificate of similar nature of works with corporate / PSU / Banks etc.

भाग– डी: दस्तावेजों को स्कैन और अपलोड किया जाना चाहिए
PART- D: DOCUMENTS TO BE SCANNED & UPLOADED

संभावित बोलीदाता सभी पात्रता मानदंडों को पूरा करने और ऑनलाइन निविदा दस्तावेज जमा करने से पहले आवश्यक सभी दस्तावेजों के कब्जे में खुद को संतुष्ट करेंगे। इच्छुक एजेंसियों को बोली जमा करने की अवधि के भीतर निम्नलिखित सूचियों के अनुसार दस्तावेजों को स्कैन / भरना और अपलोड करना आवश्यक है:

Prospective Bidders shall satisfy themselves of fulfilling all the eligibility criteria and in possession of all the documents required before submission of online tender document. The interested agencies are required to scan / fill in and upload the documents as per following lists within the period of bid submission:

ध्यान दें: बोलीदाताओं से अनुरोध है कि वे निर्धारित प्रारूप में तथ्यों और आंकड़े को भरें। बस हां या नहीं भरना स्वीकार नहीं किया जाएगा।

Note: The Bidders are requested to fill up the facts & figure in the prescribed format. Simply filling like Yes or No shall not be accepted.

1	Proof of Eligibility Criteria No.1: Work orders and Completion certificates issued by the authority concerned Documentary Proof: 1. Work Orders & Completion certificate for qualifying completed work(s) issued by Engineer-in-Charge or Owner should be attached. 2. Completion certificates for works issued by Private parties shall be supported by TDS (Tax deducted at Source) Certificates.
2	Proof of Eligibility Criteria No. 2&3: Annexure -Form "A": Financial information, Chartered Accountant certificate for the Annual financial turnover showing Profit & Loss as submitted to Income Tax Department. **Note:** Entire Balance sheet duly audited by chartered accountant to be submitted.
3	Proof of Eligibility Criteria No. 4: Annexure Form "B"- Form of Bankers Certificate from a Bank
4	Proof of Eligibility Criteria No. 5 - Registration certificate in appropriate class OR Work order / completion certificate of similar nature of works with corporate / PSU / Banks etc.
5	Form "E"- Information about Organization Structure
6	Form "F"- List of Administrative & Technical staff available with the Bidder and that proposed to be deployed to complete this work in time
7	Form "G"- Information about construction plant, Machinery, Equipment, Accessories, infrastructure facility proposed by the bidder and that proposed to be deployed to complete this work in time.
8	Form "H" Mandate Form for Payment as per Format given.
9	Undertaking as per Form "I" to be furnished by Bidders

10	Form "J" - Letter of transmittal (To be up-loaded on their letter)
11	PAN (Permanent Account Number) Registration / TAN Registration details
12	GST Registration Certificate
13	Copy of Earnest Money Deposit of Rs . 86,757/-
14	Power of attorney of the signatory of bid as per relevant clause of NIT
15	Integrity Pact: To be signed by the bidder and upload
16	Additional documents if any to meet the eligibility criteria
Note : Scanned copy of original certificates to be uploaded	

Note:

1. The applicant may furnish any additional information, which they think necessary to establish their eligibility and capability to successfully complete the envisaged work. No information shall be entertained after last date of online submission of tenders unless it is called by the competent authority. If any information furnished by the applicant is found incorrect at a later stage, they shall be liable to be debarred from tendering /taking up of work in IPR. IPR reserves the right to verify the particulars furnished by the applicant independently and reject any application without assigning any reason. 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. It is binding on the bidder to fill the data required for assessment of eligibility criteria in the excel sheet uploaded for the purpose. The technical evaluation shall be done based on the data provided in excel sheet and the relevant documents uploaded to support the same. In case where the relevant information is not filled in the uploaded excel sheets while commensurate supporting documents are uploaded, the supporting documents shall not be considered in evaluation. Therefore the bidders in their own interest shall fill all the relevant information in excel sheets and upload relevant documents. IPR shall not accept any new document after bid opening. IPR may ask for clarification and submission of documents in support of documents/information already submitted.

PART - E: STANDARD FORMATS FOR ELIGIBILITY CRITERIA TO BE UPLOADED

FORM "J": LETTER OF TRANSMITTAL

From:

_____
_____
_____

To
Chairperson ICDC,
Institute for Plasma Research,
Bhat,
Gandhinagar – 382428

Kind Attention: Mr. Prashant Singh, Officer In-charge e-tenders.

Subject: Submission of bids for the Tender for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar

Ref: **E-Tender Notice No.: IPR/TN/CIVIL/2/2020**

Sir,

Having examined the details given and bid document for the above work, I/We hereby submit the relevant information.

1. I/We hereby certify that all the statements made and information supplied in the enclosed Forms "A" to "I" and accompanying statements are true and correct.

2. I/We have furnished all information and details necessary for eligibility and have no further pertinent information to supply.

3. I/We submit the requisite certified solvency certificate and authorize IPR to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/We also authorize IPR officials to approach individuals, employers, firms and Institute to verify our competence and general reputation.

4. I/We submit the following certificates in support of our suitability, technical knowhow and capability for having successfully completed the following eligible similar works:

S. No.	Name of work	Certified by/from

Certificate : It is certified that the information given in the enclosed eligibility bid are correct. It is also certified that I / We shall be liable to be debarred , disqualified / cancellation of enlistment in case any information furnished by me / us is found to be incorrect.

Date of submission: Seal and signature of bidder

FORM "A": 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 Bidder to the Income Tax Department (copies to be scanned & uploaded).

Particulars	**Financial Year**				
	2014-15	2015-16	2016-17	2017-18	2018-19
i) Gross Annual turnover on construction work					
ii)Profit/Loss					
iii) Certified by					

Signature of Chartered Accountant with seal

Signature of Bidder

FORM "B": FORM OF BANKER'S CERTIFICATE FROM SCHEDULED BANK

This is to certify that to the best of our knowledge and information that M/s. _____ (with address) as 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: (1) Bankers certificates should be on letter head of the Bank
(2) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM "C": PRESCRIBED FORMATS: DETAILS TO BE FURNISHED FOR COMPLETED WORKS DURING THE SEVEN YEARS ENDING PREVIOUS DAY OF LAST DAY OF SUBMISSION OF TENDER

Details	Work -1	Work -2	Work- 3
Project name & Location:			
Owner or client: (Name and Address, contact Number of			
Officer to whom reference can be made)			
Project description:			
1. Type of Building:			
2. Type/nature of works details.			
Whether For Government/Semi Government/ Government undertaking/ Government autonomous bodies:			
Tendered Project Cost:			
Actual Project Cost:			
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 uploaded.
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) Bidder should submit separate form for giving details of work completed for each year, separate sheets if any shall be numbered in sequence.
4) 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 "D": INFORMATION ABOUT All ONGOING WORKS:

Details	Work -1	Work -2	Work- 3
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) 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 "E" INFORMATION ABOUT ORGANISATION STRUCTURE:

Sr. No.	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 Bidder : (Please tick and attach attested 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	
	Dept./Organization & Place of registration, Registration No.	
	Names and Titles of Director & Officers with designation proposed to be concerned with this work	
	Designation of individuals authorised to act on behalf of the organization.	

Sr. No.	Particulars	Details to be filled
	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.	
	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.	
	Has the applicant, or any constituent partner in case of partnership firm, ever been debarred / black listed for tendering in any organisation at any time? If so give details.	
	Has the applicant or any constituent partner in case of partnership firm, ever been convicted by a court of law? If so, give details.	
9	Any other information considered necessary but not included above.	

Note:

1. 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 "F": INFORMATION ABOUT ADMINISTRATIVE & TECHNICAL STAFF AVAILABLE WITH THE BIDDER AND THAT PROPOSED TO BE DEPLOYED TO COMPLETE THIS WORK IN TIME:

1.0 The bidders should submit list of technical and administrative employees for proper execution of project. The bidder should submit a list of these employees stating how these would be involved in the project.

Sr. No.	Name	Qualification	Designation	Professional experience and details of work carried out	Since when working in your firm	Total Experience (In years)	Capacity in which will be involved for this work (if to be deployed for this work)	Remarks

Note:

1. The bidders should submit list of technical and administrative employees for proper execution of project. The bidder should submit a list of these employees stating how these would be involved in the project.

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

FORM "G": INFORMATION ABOUT CONSTRUCTION PLANT, MACHINARY, EQUIPMENT, ACCESSORIES, INFRASTRUCTURE FACILITY POSSESSED BY THE BIDDER AND THAT PROPOSED TO BE DEPLOYED TO COMPLETE THIS WORK IN TIME

Sr. No	Name of Equipment/ Plant	Nos	Capa-city or Type & make	Age	Condition	Ownership status				Current Location	How many Proposed for the Project	Rem-arks
						Presently owned	Lea-sed	To be purchased	Proposed to be hired			
1	2	3	4	5	6	7	8	9	10	11	12	13

FORM "H": MANDATE FORM -FORMAT TO BE ENCLOSED

To,
The Accounts Officer, Institute for Plasma Research, Bhat, Gandhinagar - 382 428

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													
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 authority

With Name, Designation & Company's seal.

FORM "I": UNDERTAKING TO BE FURNISHED ONLINE BY THE BIDDER -

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

Name of Work: Tender for Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar

Tender number: IPR/TN/CIVIL/2/2020 dated 2.3.2020 (Two Bid System):

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 formation is found to be false at any stage of tendering or contract period I will be liable to the penal actions as prescribed in NIT.

2 That I accept all terms and conditions of NIT, including general terms and condition, special / additional terms and conditions, addendum, corrigendum, clarifications as stated there in the tender document as available on the website.

3 That I am giving my consent for e-payment.

4 That I do authorize IPR for seeking information / clarification from by bankers, clients having reference in this bid.

5 That I have uploaded photo copies of all relevant documents as prescribed in the tender document in support of the information and data furnished by me online.

6 That I accept all the undertakings as specified elsewhere in the tender document.

7 That this online 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 corporation.

8 That I hereby forward Earnest Money Deposit in demand draft or Pay order of any scheduled bank If I/we, fail to furnish the prescribed performance guarantee within prescribed period, I/we agree that the said Director, IPR or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, it I/we fail to commence work as specified, I/we agree that Director, IPR or his successors in office 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 the said earnest money shall be retained by him 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 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 notice of Department, 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- F - Tender Evaluation Process

On opening of Technical bid, further detailed scrutiny / evaluation will be carried out. During the evaluation of technical bids, the documents furnished by the Bidders will be scrutinized in detail. Any tender, found as not fulfilling the eligibility criteria will be summarily rejected and such offers will not be considered for further processing.

The Bidders who satisfies the eligibility criteria mentioned as above shall be considered as technically qualified and eligible for further processing.

The price bid of only those Bidders who have been technically qualified will be opened separately on a specified date (with due intimation to the qualified bidders) and further processed, as per tender procedure/ stipulations of Tender.

SECTION – 1 **(iii)** **BRIEF PARTICULARS OF THE WORK**

प्रस्तावित साइट आईपीआर–भाट, गांधीनगर, गुजरात में स्थित है
The proposed site is located at IPR-Bhat, Gandhinagar, Gujarat.

निविदाकार को अध्यक्ष, अवसंरचना और कैम्पस विकास समिति, प्लाज़्मा रिसर्च संस्थान की पूर्व अनुमति के साथ काम की साइट पर जाने की सलाह दी जाती है ताकि निर्माण पानी और विद्युत शक्ति के लिए संभावित टैपिंग बिंदुओं को ढेर करने के लिए साइट स्थान तक पहुंच के साथ खुद को परिचित किया जा सके। इस काम को पूरा करने वाले ठेकेदार संस्थान के सुरक्षा विनियमन और किसी भी उपकरण, संचालन, जल निकासी, सुरक्षा इत्यादि के हस्तांतरण के संबंध में संस्थान / पुलिस अधिकारियों द्वारा लगाए गए स्थानीय सांविधिक नियमों का सख्ती से पालन करेंगे।

The tenderer is advised to visit the site of work with prior permission of Chairperson, Infrastructure and Campus development committee, Institute for Plasma Research by contacting Mr. Prashant Singh, Offier Incharge e-tender, IPR (Email: etender.icdc@ipr.res.in) to acquaint himself/herself/themsleves with access to sites location for stacking the materials probable tapping points for construction water and electric power. The contractor carrying out this work will strictly abide by security regulation of the Institute and also local statutory regulations imposed by the Institute / Police authorities regarding transshipment of any equipment, operation, drainage, security etc., wherever applicable.

TENTATIVE SCOPE OF WORK:

Miscellaneous Civil works at IPR campus, Bhat, Gandhinagar - as per detailed bill of quantity.

Sr. No.	Name of work	Tentative Scope of work including Misc. civil works
1	Aluminum decorative fencing and partition work at second floor of New building	Aluminum partition and doors with aluminium grill, MS structural fabrication / framing, Anchors, locks, painting etc
2	Repainting of General area (corridors, common toilets, dining, kitchen, conference room etc) at Guest house	Repainting of old painted surface
3	Construction of transformer foundation and alied works near RF laboratory for Aditya group	Excavation, PCC, RCC, form work, steel reinforcement, MS fabrication, brick work, plastering, painting, metal filling, hume pipe, chambers, chain link fence, dismantling, etc
4	Civil work for Construction of Cricket pitch at back side of Helium tank yard	Excavation, PCC, Tre-mix RCC, form work, steel reinforcement, etc
5	Railing at Hostel block H1, H2, H3, Student facility building, Married student hostel and guest house	MS fabrication, dismantling of old MS jail, painting old/ new MS surface, anchors, etc
6	Filling of Metal inside 132 Kv sub-staion	Metal filling
7	Rain water drain at backside of seminar hall and other miscellaneous civil work	Excavation, PCC, RCC, form work, steel reinforcement, brick work, plastering, painting, hume pipe, chambers, stone flooring, door modification, dismantling, etc

SECTION – 1 - (iv) **INFORMATION & INSTRUCTIONS FOR BIDDERS**

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. Applications duly filled in / scan copies of original shall be uploaded in web site: **www.tenderwizard.com/**DAE before closing date and time of online submission of tender. **No applications shall be received in physical form.**

1.2. The Bidder should sign each page on the application along with enclosures with rubber stamp before scanning / uploading.

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 uploaded 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 **IPR.**

1.7. Any clarification given by the Institute on the basis of queries raised by the Bidders shall be uploaded and shall become part of the tender condition.

1.8. The Bidder can seek clarifications regarding tender document up to 3.4.2020 **(17:00 Hours)** by uploading their queries on website **www.tenderwizard.com/DAE.** The clarifications will be uploaded on the same web portal by 10.4.2020 **(17:00 Hours)**. No request for clarification will be considered after 3.4.2020 **(17:00 Hours)**.

1.9. **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 **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 **IPR's** name for any publicity purpose through any public media like Press, Radio, TV or Internet without the prior written approval of IPR.

2.0 **Method of Application:**

2.1 If the Bidder is an individual, the application shall be signed by him above his full typewritten name and current address.

2.2 If the Bidder is a proprietary firm, the application shall be signed by the proprietor above his full typewritten name and the full name of his firm with its current address.

2.3 If the Bidder is a firm in partnership, the application shall be signed by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm. In the latter case a certified copy of the power of attorney should accompany the application. In both cases a certified copy of the partnership deed and current address of all the partners of the firm should accompany the application.

2.4 If the Bidder is a limited company or corporation, the application shall be signed by a duly authorized person holding power of attorney for signing the application accompanied by a copy of the power of attorney. The Bidder should also upload a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

3.0 **Final Decision Making Authority:**

The Director, 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.

4.0 **Particulars provisional:**

The particulars of the work given in Section-1 (iii) are provisional. They are liable to change and must be considered only as advance information to assist the Bidder.

5.0 The Bidder should **own construction equipment** as per list required for the proper and timely execution of the work. Else, he should certify that he would be able to manage the equipment by hiring, etc. and submit the list of firms from whom he proposes to hire.

6.0 The Bidder should have sufficient number **of Technical and Administrative employees** for the proper execution of the contract. The Bidder should submit list of well qualified and experienced Engineers and Supervisors stating clearly how those would be deployed for execution of works.

B - GENERAL RULES & DIRECTIONS

1.0 Scope of bid : The Chairperson I-CDC ,IPR 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 condition 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 in prequalification criteria. 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 IPR themselves assess the document submitted along with the bid by the bidder meets the eligibility criteria as specified in notice inviting e-tender during evaluation of bid.

2.3 The bidder who has been blacklisted / de-registered / holiday at any of the sites of IPR, DAE, and any other government department shall not be eligible for participation in tenders of 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 Institute 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 may be granted permission by the 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 **Mr. Prashant Singh, officer in-charge, e-tender,** Institute for Plasma Research, Near Indira Bridge, Bhat, Gandhinagar - 382428. Preferably by **email: etender.icdc@ipr.res.in** or through **Tel No:-079-2396 2000, 2396 2069,** for fixing appointment prior to visit 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 Institute 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 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, Aadhar card etc. for security regulations. Any electronic devices like mobiles, radio, transistors, camera etc. are not allowed inside IPR premises.

5.7 The bidder shall forward any query/question by e -mail within the stipulated date and time given in NIT. The clarification given by the 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.

6.3 The documents listed below comprise one set of bid document:

- Techncial Bid
- Price Bid

7.0 Pre-bid meeting: Not applicable

8.0 Amendment of bid documents

8.1 Before the deadline for submission of bids, IPR may modify the bidding documents by issuing addendum on web site.

8.2 Any addendum so issued shall be part of the bid documents as well as contract document.

8.3 To give prospective bidders reasonable time to take an addendum into account in preparing their bids, the IPR may extend the date for submission of bids, if necessary.

8.4 Corrigendum, addendum or any other information regarding tender shall be uploaded only on web site. Hence, the bidders are requested to visit the web site (www.tenderwizard.com/DAE) 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 effect of same has been included in price bid.

9.0 Language of the bid

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

10.0 Earnest Money Deposit

10.1 The Earnest Money Deposit amount may be paid in the modes described below. The IPR shall not pay interest on the same in any case. The bidder is responsible for timely payment of Earnest Money Deposit, so that 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 the IPR due to reasons beyond control of the bidder, 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 Earnest Money Deposit to be submitted in the form of demand draft or Pay order of any Scheduled Bank in favor of INSTITUTE FOR PLASMA RESEARCH, Bhat, Gandhinagar, Gujarat. The bid can only be submitted after uploading the scanned copy of DD etc. and original should be deposited in office of Tender Inviting Authority within the period of bid submission. The bidder is solely responsible for timely deposition of Earnest Money Deposit in the correct account.

10.2 EMD exempted – Not applicable

10.3 (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 shall be returned after opening of the bid.

10.4 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.

10.5 The 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 himself on e –tendering portal.

11.0 Bid prices, rates & taxes

11.1 The bidder should quote his rates in figures only.

11.2 In the case of item rate tenders, only rates quoted shall be considered. In case of lump sum tender, only lump sum quoted amount shall be considered.

11.3 The rates, prices and total bid price submitted by the contractor shall be inclusive of terminal or other duties, GST, VAT, CST, turnover tax, work contract tax, octroi, cess, or any other similar tax applicable under the existing laws or levy by the statuary authorities/state/central government in performance of this contract including GST. This is an indivisible works contract. The rates quoted shall include all taxes including Goods and Service Tax (GST) at applicable rates and levies, duties, cess etc., payable under respective statues. Deductions as per statues will be effected from the bill and remitted to the Department concerned.

11.4 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 by the government.

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.

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

12.0 Currencies of bid and payment

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

13 Bid validity

13.1 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 cancelling 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 IPR.

13.2 In exceptional circumstances, prior to expiry of the original bid validity period, 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.

14.0 Alternative proposals by bidders

14.1 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.

15.0 Submission of the bids

15.1 The date and time of on-line 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.

15.2 The IPR may extend the deadline for submission of bids by issuing an amendment, in which case, all rights and obligations of the Institute and the bidders previously subject to the original deadline will then be subject to the new deadline.

15.3 Any bid received by the IPR after the deadline prescribed above will be rejected.

15.4 The bidders shall note the following before submission of bid

(a) If the digital signature certificate (DSC) holder is sole proprietor of the firm, power of attorney need not be submitted.

(b) In case DSC holder is bidding on behalf of partnership firm, joint venture, consortium etc. power of attorney or any other legally acceptable document viz. partnership deed, board resolution etc. authorizing DSC holder to bid on behalf of the bidder is to be uploaded. In case of non-submission the bid shall be summarily rejected.

16.0 Bid opening

16.1 Tender opening shall be done on-line. On opening, the Bidders can see their bid status. The authorized representative of Bidders may remain present (if so desires) during opening of Bid. The authorized representative should have valid photo identity and original authority letter issued by competent authority of their company. 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.

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

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

17.0 Clarification of bids

17.1 To assist in the examination and comparison of bids, the 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.

17.2 Bidder shall not contact the IPR on any matter relating to his bid from the time of the bid opening to the time the contract is awarded.

17.3 Any effort by the bidder to influence the IPR bid evaluation, bid comparison or contract award decisions, may result in the rejection of his bid.

18.0 Examination of bids and determination of responsiveness

18.1 Prior to detailed evaluation of bids, the 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 as per clause-15.4.

18.2 A responsive bid is one which conforms to all the terms, conditions and specification of the bidding documents.

19.0 ~~Evaluation and comparison of bids~~ - Not Applicable

~~19.1 The Institute reserves the right to accept or reject any offer. IPR also reserves the right to award only part of the work.~~

~~19.2 The estimated effect of the price adjustment conditions under variations and deviations of the conditions of contract, during the period of implementation of the contract, will not be taken into account in bid evaluation.~~

20.0 ~~Award criteria~~ - Not Applicable

~~20.1 The IPR shall award the contract to the bidder whose evaluated offer / bid has been determined to be the technically suitable and financially lowest (L1) and is substantially responsive to the bidding document, provided further that the bidder is determined to be qualified to execute the contract satisfactorily. The technically and financially suitable bids in other types of bids shall be decided as per criteria given in eligibility requirement. In case of tie between two lowest bidders, both the bidders shall be given a chance to offer rebate to decide the lowest bid. If the situation still remains same the lottery shall be adopted to decide the award.~~
~~20.2 L 1 bidder will be required to produce the original documents in support of the information furnished by him on line for verification as specified in NIT/e-tender notice. The bidder shall submit the same on any working day within specified period after issue of letter to this effect. In case the L-1 bidder fails to produce the documents within the specified period or if any of the information furnished by L-1 bidder on line is found to be false during verification of original document, which changes the eligibility status of the bidder, then the bid shall be disqualified with forfeiture of Earnest Money Deposit and banning of the concerned bidder for participation in future tenders for five years. The next financial lowest qualified bidder shall be awarded the work subject to producing original documents.~~
~~20.3 Submission of illegible or blank document may render the bid non-responsive and liable for rejection. Submission of bid will be recognized and accepted as a certificate regarding authentication of all information provided in the bid and acceptance of all terms & conditions, general condition of contract, notice inviting tender etc., since such acceptance by bidder with digital signature is legally tenable.~~
~~20.4 The IPR reserves the right not to award the work without assigning reason and without incurring any liability to the bidder or bidders.~~

21.0 Notification of award and signing of agreement

21.1 The bidder whose bid has been accepted will be notified of the award by the 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.

21.2 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.

21.3 The work order will constitute the formation of the contract subject only to the furnishing of a performance guarantee within period as specified in schedule F.

21.4 An agreement shall be made and signed by both the parties. The agreement will incorporate all correspondence between the IPR and the successful bidder, bid documents etc. The bid document as uploaded on website www.tenderwizard.com/DAE shall be forming part of 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.

22.0 Corrupt or fraudulent practices

22.1 The 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, the 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 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 the 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.

22.2 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 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.

23.0 Disclosures

23.1 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 the IPR, at any time between the submission of bids and the signing of the contract.

SECTION: 2

Conditions of Contract

SECTION: 2 - (i) - GENERAL CONDITIONS.

Definitions

1. The **Contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between the Director, 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 Engineer-in-Charge 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 **Director or Director, IPR** means the Director of the Institute for Plasma Research.

v. **The Chairperson, ICDC, IPR** means chairman of the Infrastructure and campus development committee of the Institute for Plasma Research.

vi. The **Engineer-in-charge** means the Engineer or Officer who shall supervise and be in - charge of the work and who shall sign the contract on behalf of the Director, IPR as mentioned in Schedule 'F' hereunder.

vii. Department/**Institute**/IPR/Principal Employer shall mean the Institute for Plasma Research.

viii. **Accepting Authority** shall mean the authority mentioned in Schedule 'F'.

ix. **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, 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.

x. **Market Rate** shall be rate as decided by the Engineer-in-Charge 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.

xi. **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.

xii. **District Specifications** means the specifications followed by the State Government in the area where the work is to be executed.

xiii. **Tendered value** means the value of the entire work as stipulated in the letter of award.

xiv. 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.

6. **Works to be carried out**

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

7. **Sufficiency of Tender**

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

8. **Discrepancies and Adjustment of Errors**

The several documents forming the Contact 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) SAC SOR Specifications.
v) C.P.W.D. Specifications.
vi) 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.

9. **Signing of Contract**

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) 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. Director or his representative may issue instruction/actions for the said works from time to time, which should be binding on the contractor.

SECTION - 2 - (ii) - CLAUSES OF CONTRACT

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 Engineer-in-Charge 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 Engineer-In-Charge. This guarantee shall be in the form of banker's cheque of any schedule bank /Demand draft of any schedule bank/pay order of any schedule bank or Fixed Deposit Receipt or Guarantee bond of any schedule bank in accordance with the from 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 Engineer-in-Charge 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 Engineer-in-Charge may claim the full amount of the Performance Guarantee.

b) Failure by the contractor to pay the Director, IPR 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 Engineer-in-Charge.

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 Director, IPR.

v) On substantial Completion of any work which has been completed to such an extent that the intended purpose of the work is met and ready to use, then a provisional Completion certificate shall be recorded by the Engineer-in-Charge. The provisional certificate shall have appended with a list of outstanding balance item of work that need to be completed in accordance with the provisions of the contract.

This provisional completion certificate shall be recorded by the concerned Engineer- in–charge with the approval of Chairperson I-CDC After recording of the provisional Completion Certificate for the work by the competent authority, the 80 % of 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 40% of performance guarantee shall be returned to the contractor, without any interest after recording the provisional Completion certificate.

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 Institute by way of Security Deposit unless he /they has /have deposited the amount of Security at the rate mentioned above in Cash or in the form of / or Fixed Deposit Receipts. In case a fixed Deposit Receipt of any Scheduled bank is furnished by the contractor to the Institute as a part of the Security Deposit 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 government to make good the deficit.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising 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, in cash or fixed deposit receipt tendered by the State Bank of India or by scheduled banks endorsed in favor of the Institute, 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 Scheduled 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 justified extended date of completion, as per clause 5(excluding any extension under Clause 5.5) as well as any extension granted under clauses 12 and 15, 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 authority specified in schedule 'F' (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 @ 1.0 % 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 Sectional part of work as mentioned in Schedule 'F' for which a separate period of completion is originally given.

In case no compensation has been decided by the Authority in schedule 'F', during the progress of work, this shall be no waiver of right to levy compensation by the said authority if the work remains incomplete on final justified extended date of completion. If the Chairperson ICDC decides to give further extension of time allowing performance of work beyond the justified extended date, the contractor shall be liable to pay compensation for such extended period. If any variation in amount of contract takes place during such extended period beyond justified extended date and the contractor becomes entitled to additional time under clause 12, the net period for such variation shall be accounted for while deciding the period for levy of compensation. However, during such further extended period beyond the justified extended period, if any delay occurs by events under sub clause 5.2, the contractor shall be liable to pay compensation for such delay.
Provided that compensation during the progress of work before the justified extended date of completion for delay under this clause shall be for non-achievement of sectional completion or part handing over of work on stipulated/justified extended date for such part work or if delay affects any other works/services. This is without prejudice to right of action by the Engineer in Charge under clause 3 for delay in performance and claim of compensation under that clause.

In case action under clause 2 has not been finalized and the work has been determined under clause 3, the right of action under this clause shall remain post determination of contract but levy of compensation shall be for days the progress is behind the schedule on date of determination, as assessed by the authority in Schedule F, after due consideration of justified extension. The compensation for delay, if not decided before the determination of contract, shall be decided after of determination of contract.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with 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 as above. - With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE 2A (Incentive for early completion) (Not applicable)

~~In case, the contractor completes the work ahead of updated stipulated date of completion or justified extended date of completion as determined under clauses 5.3,12 & 15 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. Provided that justified time for extra work shall be calculated on pro-rata basis as cost of extra work X stipulated period /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, Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages, and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

(i) If the contractor having been given by the Engineer-in-charge 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 Engineer-in-Charge (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 Engineer-in-Charge.

(iii) If the contractor fails to complete the work or section of work with individual date of completion on or before the stipulated or justified extended date, on or before such date of completion; and the Engineer in Charge without any prejudice to any other right or remedy under any other provision in the contract has given further reasonable time in a notice given in writing in that behalf as either mutually agreed or in absence of such mutual agreement by his own assessment making such time essence of contract and in the option of Engineer-in-Charge the contractor will be unable to complete the same or does not complete the same within the period specified..

(iv) If the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

(v) If the Contractor shall offer or give or agree to give to any person in 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 Engineer- in- Charge.

(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,(excluding part(s) of work assigned to other agency(s) by the contractor as per terms of contract), transfers, sublets (engagement of labour on a piece work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with entire works or any portion thereof without the prior written approval of the Engineer- In charge.

When the contractor has made himself liable for action under any of the cases aforesaid, Engineer-in-Charge shall have powers:

(a) To determine the contract as aforesaid so far as performance of work by the contractor in concerned(of which determination notice in writing to the contractor under the hand of the Engineer – in - Charge shall be conclusive evidence). Upon such determination the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the 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 Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements /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 Engineer- in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 3A

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 more, either party may close the contract by giving notice to the other party stating reasons. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits:

(i)	If the Tendered value of work is up to 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 Crore:	30 days.

Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party.

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

CLAUSE 5 (Time and Extension for Delay)

The time allowed for execution of the Works as specified in the Schedule 'F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in schedule 'F' or from the date of handing over of the site notified by the Engineer-in-Charge, whichever is later. However the handing over of site by the Engineer-in-Charge, in full or in part (if so provided in contract), shall be completed within two months from issue of acceptance letter. If the contractor commits default in commencing the execution of the work as aforesaid, the performance guarantee shall be forfeited by the Engineer-in-Charge and shall be absolutely at the disposal of the Institute - without prejudice to any other right or remedy available in law, -

5.1 As soon as possible but within twenty one days of award of work and in consideration of
a) Schedule of handing over of site as specified in the Schedule 'F'.
b) Schedule of issue of designs as specified in the Schedule 'F'.

(i) The Contractor shall submit a Time and Progress Chart for each milestone. The Engineer-in-Charge may within 30days thereafter, if required modify, and communicate the program approved to the contractor failing which the program submitted by the contractor shall be deemed to be approved by the Engineer-in-Charge. The work programme shall include all details of balance drawings and decision required to complete the contract with specific dates by which these details are required by contractor without causing any delay in execution of the work. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of

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

(ii) In case of non-submission of construction programme by the contractor the program approved by the Engineer-in-Charge shall be deemed to be final.

(iii) The approval by the Engineer-in-Charge of such programme shall not relieve the contractor of any of the obligation under the contract.

(iv) The Contractor shall submit the Time and Progress Chart and progress report using the mutually agreed software or in other format decided by the Engineer-in-Charge for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs. 2500/-(for work costing up to Rs. 20 Crores)/Rs. 5000/-(for work costing more than Rs. 20 Crores) shall be made on per week or part 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 Engineer-in-Charge 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 like above which, in the reasoned opinion of the Engineer-in-Charge is beyond the Contractor's control.

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge – for entry in the hindrance register (physical or web-based as prescribed 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 Engineer-in-Charge to proceed with the works.

The contractor shall have no claim of damages for extension of time granted or rescheduling of milestone/s for events listed in sub clause 5.2.

5.3 In case the work is hindered by any reasons, in the opinion of the contractor, by the Department or for someone for whose action the Department is responsible, the contractor may immediately give notice thereof in writing to the Engineer-in-Charge in the same manner as prescribed under sub Clause 5.2 seeking extension of time or rescheduling of milestone/s. The authority as indicated in Schedule 'F' shall, if justified, give a fair and reasonable extension of time and reschedule the mile stones for

completion of work after due consideration of the same within 30 days of receipt of such request. In event of non-application by the contractor for extension of time, Chairperson I-CDC after affording opportunity to the contractor may give, supported with a programme, a fair and reasonable extension within a reasonable period of occurrence of the event.

Such extension of time or rescheduling of milestone/s shall be without prejudice to any other right or remedy of the parties in contract or in law; provided further that for concurrent delays under this sub clause and sub clause 5.2 to the extent the delay is covered under sub clause 5.2 the contractor shall be entitled to only extension of time and no damages.

5.4 Request for rescheduling of Mile stones or 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 forms i.e. Form of application by the contractor for seeking rescheduling of milestones (Appendix-XVI) or Form of application by the contractor for seeking extension of time (Appendix –XVII) respectively to the authority as indicated in Schedule 'F'. The Contractor shall indicate in such a request the period by which rescheduling of milestone/s or extension of time is desired.

With every request for rescheduling of milestones, or if at any time the actual progress of work falls behind the approved programme by more than 10% of the stipulated period of completion of contract, the contractor shall produce a revised programme which shall include all details of pending drawings and decisions required to complete the contract and also the target dates by which these details should be available without causing any delay in execution of the work. A recovery as specified in Schedule 'F' shall be made on per day basis in case of delay in submission of the revised programme.

5.4.1 In any such case the authority as indicated in Schedule 'F' may give a fair and reasonable extension of time for completion of work or reschedule the mile stones. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Schedule 'F' in writing, within 30 days of the date of receipt of such request from the Contractor in prescribed form. In event of non-application by the contractor for extension of time Chairperson I-CDC after affording opportunity to the contractor, may give, supported with a programme (as specified under 5.4 above), a fair and reasonable extension within a reasonable period of occurrence of the event.

5.5 In case the work is delayed by any reasons, in the opinion of the Chairperson I-CDC, by the contractor for reasons beyond the events mentioned in clause 5.2 or clause 5.3 or clause 5.4 and beyond the justified extended date; without prejudice to right to take action under Clause 3, the Chairperson I-CDC may grant extension of time required for completion of work without rescheduling of milestones. The contractor shall be liable for levy of compensation for delay for such extension of time.

CLAUSE 6 (Measurement of Work Done) (Not Applicable)

~~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 on 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 One Lac - or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over one lac, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the 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 no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer- in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The amount admissible shall be paid by 10th working day after the day of presentation of the bill by the Contractor to the Engineer-in-Charge or his Asst. Engineer 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 @ 10% - 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 Engineer-in-Charge in his sole discretion on the basis of a certificate from the Assistant Engineer 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 to be submitted by the contractor within 10 days of the interim payment. In case of delay in submission of bill by the contractor a simple interest @ 10% per annum shall be paid to the Institute from the date of expiry of prescribed time limit which will be compounded on yearly basis. **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 directly to the main contractor.

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 7A

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

CLAUSE 8 (Completion Certificate and Completion Plans)

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete 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 they 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 as required vide General Specification for Electrical works (Part-I internal) 2005 and (Part-II External) 1994 as applicable, within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum of 0.1% of Tendered Value of limit prescribed in Schedule F Whichever is more as may be fixed by the Institute and in this respect the decision of the Institute shall be final and binding on the contractor.

The Contractor shall submit completion plan for Internal and External Civil, Electrical and Mechanical Services within thirty days of the completion of the work, provided that the service plans having been issued for execution by the Engineer-in-Charge, unless the contractor, by virtue of any other provision in the contract, is required to prepare such plans.

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 Engineer-in-Charge, 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 Engineer-in- Charge or his authorized Asst. Engineer, 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 is more than Rs.45 lakhs and up to Rs.2.5 Crore: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 @10% 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, registered financial, Co-operative or thrift societies or recognized financial Institutions 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 ,registered financial, Co-operative or thrift societies or recognized financial Institutions 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, registered financial, Co-operative or thrift societies or recognized financial Institutions. While the receipt given by such banks registered financial, Co-operative or thrift societies or recognized financial Institutions 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, registered financial, Co-operative or thrift societies or recognized financial Institutions

Nothing herein contained shall operate to create in favour of the bank, registered financial, Co-operative or thrift societies or recognized financial Institutions any rights or equities vise-verse the Director, IPR.

CLAUSE 10 (Materials Supplied by the Institute)

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 other than those which are stipulated to be supplied by the Institute.

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 Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 75% 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 Engineer-in-Charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

(ii) Mobilization Advance: (Not applicable)

~~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 Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer-in- Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge~~.

~~Before any installment of advance is released, the contractor shall execute Bank Guarantee Bonds not more than 6 in number form Schedule Bank for the amount equal to 110% of the amount advance and valid for the period till recovery of advance. This (Bank Guarantee from Schedule Bank for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.~~

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

(iii) Plant Machinery & Shuttering Material Advance (Not applicable)

~~An advance for plant, machinery & shuttering material required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery, which in the opinion of the Engineer-in-Charge will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 5% percent of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income-Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs. 50,000/- Seventy five percent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.~~

~~Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:~~

~~1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.~~

2. Engineer in Charge, and
3. The contractor

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in working order and are maintained in working order; (c) hypothecated to the Institute as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and form work shall be treated as plant and equipment.

The contractor shall insure the Plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

(iv) Interest & Recovery :

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.

(v) If the circumstances are considered reasonable by the Engineer-in-Charge, 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 Engineer-in-Charge.

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

If after submission of the tender, if the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 hereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any variation of rate in GST applicable on such material(s) being consider under this clause) 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

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) 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 not being materials supplied from the Engineer-

in-Charge's stores in accordance with Clause-10 hereof) 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 85% of the value the work executed during period under consideration shall not exceed 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. The cost of work for which escalation is applicable (W) is same as cost of work done worked out as indicated in sub-para (ii) of clause 10CC except the amount of full assessed value of secured Advance.

CLAUSE 10 CA (Payment due to variation in prices of materials after receipt of tender) (not applicable)

~~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 including Noida, Gurgaon, Faridabad & Ghaziabad 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 x Q x (Cl-Cl0) / Cl0~~

~~Where,~~

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

~~P = Base Price of material as issued under authority of DG(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..~~

~~Cl0 = 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.~~

~~(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 prorate 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) f 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 us 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) (Not applicable)~~

~~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)~~
~~l) 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) $Vm = \frac{Wx \; Xm \; x \; Ml - Ml_0}{100 \quad Ml_0}$

Vm=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

Xm = 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 Gov. 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 prorate basis only as cost of extra works x stipulated period / tendered cost, shall be considered.)

Ml_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 Gov. 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 if 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 three months' 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:

$VL = \frac{W \; x \; Y \; x \; Ll - Ll_0}{100 \quad Ll_0}$

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 1OCC 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 (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 Engineer-in-Charge.

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

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions 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 and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE 12: (Deviations / Variations Extent and Pricing)

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

The Completion cost of any agreement for Maintenance works including works of up gradation, aesthetic, special repair, and addition/alteration shall not exceed 1.25 times of the Tendered amount. Any further deviation beyond this limit up to 1.5 times of tendered amount shall be approved by Chairperson I-CDC

with recorded reason and in exceptional case, The Director shall have full power to approve the deviation beyond 1.50 times of tendered amount with recorded reason and take suitable corrective action.

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 Engineer-in-Charge.

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, which shall include invoices, voucher etc. and Manufacture's specification for the work failing which the rate approved later by the Engineer-in-Charge shall be binding and the Engineer-in-Charge shall within the prescribed time limit 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, failing which it will be deemed to have been approved.

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

In the case of Extra Items(s) being the schedule items **(Space application Centre (SAC Ahmedabad SOR 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 **(NON SAC SOR items)** shall be made as per the prevailing market rate.

12.2a 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 up gradation, aesthetic, special repair, addition/alternation:

In the case of substituted item(s) being the schedule items **(Space application Centre (SAC Ahmedabad SOR 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 **(NON SAC SOR)** shall be made as per prevailing market rate.

12.2b 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 Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of up gradation, aesthetic, special repair, 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 is within 30days after submission of proposal by the contractor without observation of the Engineer-in-Charge.:

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 up gradation, 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 the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

12.4 The contractor shall send to the Engineer-in-Charge once every three months an 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 Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Engineer in charge 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 or during the progress of the work, the purpose or object for which the work is being done changes due to any supervening cause and as a result of which the work has to be abandoned or reduced in scope the Engineer-in-Charge shall give notice in writing to that effect to the contractor stating the decision as well as the cause for such decision and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

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

i) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.

ii) 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 Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the Institute from the contractor under the terms of the contract.

In the event of action being taken under Clause 13 to reduce the scope of work, the contractor may furnish fresh Performance Guarantee on the same conditions, in the same manner and at the same rate for the balance tendered amount and initially valid up to the extended date of completion or stipulated date of completion if no extension has been granted plus 60 days beyond that. Wherever such a fresh Performance Guarantee is furnished by the contractor the Engineer-in-Charge may return the previous Performance Guarantee.

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

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 Engineer-in-Charge; 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 Engineer-in-Charge; or

(iii)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 Engineer-in-Charge;

The Engineer-in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to 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 Engineer-in-Charge 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 Engineer-in-Charge, 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 Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such

time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:

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

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 Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

iii) If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as 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 Engineer-in-Charge. 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)

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 of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or to the Chief Engineer in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the Institute for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract the contractor shall, on demand in writing which shall be made (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 Engineer-in-Charge 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 Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the 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 Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.

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

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & Plants as specified in Schedule F. In addition to this, appliances, implements, other plants ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in- Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage 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 under the 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 comply with provision of the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.**

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 the age of 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 Engineer-in-Charge 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 Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

In the case of Union Territory of Delhi, however, as the all-inclusive minimum daily wages fixed under Notification of the Delhi Administration No.F.12(162)MWO/DAB/ 43884-91, dated 31-12-1979 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday would not arise.

(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

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

The contractor shall submit by the 4th and 19th day 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 Engineer-In-Charge 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

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

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

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 Engineer in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the 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 Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities 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 Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodeled and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19 H

The contractor(s) shall at his/their own cost 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 outside 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

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

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 up to 5% of tendered value of work may be imposed by the Chairperson ICDC , IPR whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Chairperson I-CDC IPR, 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, CIDC 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, it's 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.

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

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 Engineer- in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of 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

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

CLAUSE 25 (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 Engineer-in-Charge or if the Engineer in Charge considers any act or decision of the contractor on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable and is disputed, such party shall promptly within 15 days of the arising of the disputes request the Chairperson I-CDC who shall refer the disputes to Dispute Redressal Committee (DRC) within 15 days along with a list of disputes with amounts claimed if any in respect of each such dispute. The Dispute Redressal Committee (DRC) shall give the opposing party two weeks for a written response, and, give its decision within a period of 60 days extendable by 30 days by consent of both the parties from the receipt of reference from Chairperson I-CDC. The constitution of Dispute Redressal Committee (DRC) shall be as indicated in Schedule 'F'. Provided that no party shall be represented before the Dispute Redressal Committee by an advocate/legal counsel etc.

If the Dispute Redressal Committee (DRC) fails to give its decision within the aforesaid period or any party is dissatisfied with the decision of Dispute Redressal Committee (DRC) or expiry of time limit given above, then either party may within a period of 30 days from the receipt of the decision of Dispute Redressal Committee (DRC), give notice to the Director IPR, for appointment of arbitrator on prescribed proforma as per Appendix XV under intimation to the other party.
It is a term of contract that each party invoking arbitration must exhaust the aforesaid mechanism of settlement of claims/disputes prior to invoking arbitration.

The Director IPR, shall in such case appoint the sole arbitrator within 30 days of receipt of such a request and refer such disputes to arbitration. It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed, if any, in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the decision of the DRC.

Parties, before or at the time of appointment of Arbitrator may agree in writing for fast track arbitration as per the Arbitration and Conciliation Act, 1996 (26 of 1996) as amended in 2015.

Subject to provision in the Arbitration and Conciliation Act, 1996 (26 of 1996) as amended in 2015 whereby the counter claims if any can be directly filed before the arbitrator without any requirement of reference by the appointing authority,

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 as per the Act.

The place of arbitration shall be as mentioned in Schedule F.

CLAUSE 26 (Contractor to indemnify Institute against Patent Rights)

The contractor shall fully indemnify and keep indemnified the Director, IPR 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 Director, IPR if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27 (Lump sum Provisions in Tender)

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

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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge of the Institute or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Institute will be kept withheld or retained as such by the Engineer-in-Charge 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 Engineer-in-Charge 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 Chairperson I-CDC IPR on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Chairperson I-CDC IPR

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 Engineer-in-Charge or the Institute or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge 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 Engineer- in-Charge 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 Engineer-in-Charge or the Institute will be kept withheld or retained as such by the Engineer-in-Charge 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 laour 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 Commissioner, Districts of Bankuara, Birbhum, Burdwan, District of Bilaspur.

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

CLAUSE 31 (Unfiltered water supply)

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

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

CLAUSE 31 A (Institute water supply, if available) - Not Applicable

~~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 Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor.

(ii) The contractor shall be allowed to construct temporary wells in Institute land for taking water for construction purposes only after he has got permission of the Engineer-in-Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to Construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.

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 Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer- in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to 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 Engineer-in-Charge. In such a case all the conditions hereunder for issue of T&P shall also be applicable to such T&P as is agreed to be issued.

(ii) Plant 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 alter the completion of the work for which it was issued. Chairperson I-CDC, IPR 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 (excluding intervening holidays and Sundays) for bringing the plant in order the contractor shall immediately intimate in writing to the Engineer-in-Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log-sheet of the plant or machinery. Based on this, if the 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 Chairperson I-CDC IPR 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 Engineer-in-Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption

that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure)

(xi) In the case of concrete mixers the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or each occasion. a) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of Departmental rollers, maximum quantity of any items to be consolidated for each roller-day shall also be same as in Annexure to Clause 34(x) For less use of rollers, recovery for the less roller days shall be made at the stipulated issue rate.

(xii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. Chairperson I-CDC, IPR 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 Engineer-In-Charge 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 Engineer-in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

CLAUSE 35 (Condition relating to use of asphaltic 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 Engineer-in-Charge 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 Engineer-in-Charge in writing.

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

CLAUSE 36 (Employment of Employees 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-charge and shall be available at Site before start of work.

All the provisions applicable to the principal technical representative under the clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at site of work for supervision at all times when any construction activity is in progress and also present himself/ themselves, as required, to the Engineer in charge and/ or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available the decision of the Engineer-in –Charge as recorded in the site order book and measurement recorded checked/test checked in measurement books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical principal technical representative and/or other technical representative(s) and if such 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 Engineer-in-charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) along with every on account bill/final bill and shall produce evidence if at any time so required by the Engineer-in-Charge 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 Engineer In charge and shall also note down instructions conveyed by the Engineer-in-charge or his designated representative(s) in the site order book and shall affix his/ their signature in token of noting down the instructions and in token of acceptance of measurements/ checked measurements/ test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule 'F'. And the decision of the Engineer-In-Charge as recorded in the site order book and measurement recorded checked/test checked in measurement books shall be final and binding on the contractor. Further , if the contractor fails 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 do not discharge their responsibilities satisfactorily, the Engineer-in-Charge 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 bill and shall produce evidence if at any time so required by the Engineer-in-charge.

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

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

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

CLAUSE 37 (Levy / Taxes payable by Contractor)

(i) GST, Building and other Construction Workers Welfare Cess or any other tax, levy or Cess in respect of input for or output by this contract shall be payable by the contractor and Government shall not entertain any claim whatsoever in this respect except as provided under Clause 38.

(ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.

If pursuant to or under any law, notification or order any royalty cess or the like becomes payable by the Institute / Government of India 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 of India 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 any tax, levy or cess applicable on last stipulated date of receipt of tender including extension if any. No adjustment i.e. increase or decrease shall be made for any variation in the rate of GST, Building and Other Construction Workers Welfare Cess or any tax, levy or cess applicable on inputs.

However, effect of variation in rates of GST or Building and Other Construction Workers Welfare Cess or imposition or repeal of any other tax, levy or cess applicable on output of the works contract shall be adjusted on either side, increase or decrease.

Provided further that for Building and Other Construction Workers Welfare Cess or any tax (other than GST), levy or cess varied or imposed after the last date of receipt of tender including extension if any, any increase shall be reimbursed to the contractor only if the contractor necessarily and properly pays such increased amount of taxes/levies/ cess.

Provided further that such increase including GST shall not be made in the extended period of contract for which the contractor alone is responsible for delay as determined by authority for extension of time under Clause 5 in Schedule F.

(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 Engineer-in-Charge 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 Engineer-in-Charge 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, Chairperson I-CDC IPR on behalf of the Director, IPR shall have the option of terminating the contract without compensation to the contractor.

CLAUSE 40 (If Relative 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 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 Gazetted 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.)

(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 laps, 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 Chairperson I-CDC, 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 Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer- in-Charge, such payments being in addition to compensation 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 Chairperson I-CDC, IPR up to Rs. 5000/-

and by the Director concerned for a higher amount. 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 Chairperson I-CDC/ IPR.

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 Chairperson I-CDC, IPR 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 Engineer-in-Charge. The Engineer-in-Charge, 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.

SECTION: 2 - (ii) (a) Integrity Pact.

To,

_____

_____

Subject: NIT No. _____ For the work _____

Dear Sir,

It is hereby declared that Institute for Plasma Research 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 from 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 Institute for Plasma Research.

Yours faithfully,

Chairperson I-CDC, IPR

Integrity Pact

To,
Chairperson I-CDC IPR

Subject: Submission of Tender for the work of _____

Dear Sir,

I/We acknowledge that Institute for Plasma Research 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 REARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE OF THIS CONDITION 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 Institute for Plasma Research. 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, 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 of .....20….....

BETWEEN

Director, IPR represented through Chairperson I-CDC Institute for Plasma Research, Bhat Gandhinagar-382428……, (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

……..……
(Name of Work)
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 endeavor 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 non-submission 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 Headquarters 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 intensions.
(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:

SECTION: 2 - (iii) - 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 works will be 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 Engineer-In-Charge 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 fir 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 Chairperson I-CDC or his authorized representative of Institute for Plasma Research 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, equipment's, ranges and labour that may be required in setting out or laying out any part of the work. The contactor 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 every day 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 coordinating his work, with 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, embedment's 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 Engineer-in-Charge 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 Engineer-in-Charge, 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 Engineer-in-Charge 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 Engineer-in-Charge and storage of materials shall be over the areas specially indicated by the Engineer-in-Charge. 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 Engineer-in-Charge 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 Engineer-in-Charge

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 noncompliance 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 Engineer-in-Charge 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 expanses 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 maternal 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 Engineer-in-Charge 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 Engineer-in-Charge.

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 Engineer-In-Charge.

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 or water is strictly prohibited. Contamination and pollution of water 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, and 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 **1000 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 overhead 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, equipment's 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 out lets 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 earthling. All metallic frames, light fixtures, portable equipment's 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 equipment's, installation and maintenance etc. at site.

19.3 Additional Power:

Power in excess of the limit stipulated above, May subject to availability, be provided if applied for by the contractor by installing additional cables/lines from the changeover 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 GST, 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, 10 CA and 10 CC 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.

For any deviations or claims or extra items arising out of this contract, the contractor will be entitled for overheads and profits of 2.5% (Two and half) only towards handling, storing etc. of such materials which are supplied by the Institute under schedule 'B' at fixed issue rates/procurement rates in case of free issue materials.

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 of 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 Engineer-in-Charge 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 Engineer-in-Charge, 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 INSTRUCTIONS:

The Engineer-In-charge 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 Engineer-In-charge

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' rules. **The Contractor shall insure his labourers with 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Saturdays, Sundays, Holidays and late hours even though permission will be accorded by the Engineer-in-Charge, the contractor will have to make application to the Institute and keep them informed well in advance.

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 labours/persons to be deployed at site should be furnished along with undertaking well in advance.

(b) **The entry and exit of contractor's labours / 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 & laborer's 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/labour 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 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 Engineer-in-Charge 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, proto-type 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, and 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 Ahmedabad/Gandhinagar only.

34. Engagement of Specialized Agencies:

Contractor should submit the credentials of Water Proofing, Anti Termite Treatment, HVAC works , Firefighting works & Electrical Work specialized agencies to be engaged (from the list of approved make / manufacturer / vendor) by the contractor for the approval of Engineer- In-Charge. 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/labour will not be allowed to stay inside the Institute campus.

36. Temporary Fencing around Site: (Not Applicable)

~~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 singed 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 EIC at the Institute either at site / Institute for Plasma Research 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 equipment's, 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.

44 Door-Window Hardware – The Contractor to procure all the Hardware's and accessories of same make from the list of approved makes.

45 SITE **TO BE CLEAN:**

The contractor undertakes to have the site clean, free from rubbish to the satisfaction of the Engineer-in-Charge. All surplus materials, rubbish, etc. will be removed to the place fixed by the Engineer-in-Charge and nothing extra will be paid. Mud or debris obtained during the course of construction by way of dismantling or on completion of the various items of work or otherwise, shall be disposed off by the contractor at the low lying areas, anywhere in the project site/colony area without any extra cost to the Institute, as directed by the Engineer-in-Charge and the contractor shall not be permitted to take the dismantled materials/debris outside the Project site/Colony Area.

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SECTION: 2 - (iv) PROFORMA OF SCHEDULES

Salient Governing Features of the Tender / Work

SCHEDULE 'A' :	Schedule of quantities		
Schedule of Quantities -		Attached	*As per price bid*
	Location : Institute for plasma research, Near Indira bridge, Bhat, Gandhinagar – 382 428		

SCHEDULE 'B' :		Schedule of Materials to be issued to the contractor – No materials to be supplied to the contractor.		
Sr. No	***Description of item***	***Quantity***	***Rates in figures and words at which the material will be charged to the contractor.***	***Place of issue***
1	*2*	*3*	*4*	*5*
1.	*Grey Cement in bags*		Contractor own arrangement.	-------
2.	*Re-Bars for RCC*		Contractor own arrangement.	--------
3.	*Water for construction Purpose*		Department supply on request as per conditions of contract - Free of Cost.	--------
4.	*Electricity for construction purpose*		Department supply on request as per conditions of contract ~~@ Rs. 6.50 per Unit. /~~ - Free of Cost.	---------

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

SCHEDULE 'D'	
Extra schedule for specific requirements / documents for the work, if any	Particularly for Security Regulations as per Conditions of contract

SCHEDULE 'E' :	**Reference to General Conditions of Contract.**	**As per Tender document**
Name of Work:		
Estimated cost of work :		**Rs. 43,37,830/-**
i) Earnest money	*(To be returned after receiving performance bank guarantee)*	**Rs. 86,757/-**
ii) Performance Guarantee		**5% of tendered value**
iii) Security Deposit		**2.5% of tendered value**

SCHEDULE 'F' :

General Rules & Directions :	
Officer inviting tender :	On the behalf of Director , IPR by Chairperson I-CDC Institute for Plasma Research, Near Indira Bridge, Bhat, Gandhinagar -382428 Contact Person: Mr Prashant. Singh Officer, In-charge e-Tender. Phone No : 079- 2396 2000, 2396 2069 Fax – 079-2396 2377
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 below

Definitions : Conditions of Contract			
15	**2(v)**	Engineer-in-charge	Engineer-in-Charge or his representatives who shall supervise the work
16	2(viii)	Accepting Authority	Director, Institute for Plasma Research
17	2(x)	Percentage on cost of materials and labour to cover all overheads & profits	15% (Fifteen percent)
18	2(xi)	Standard Schedule of Rates (SOR)	Civil Engineering Division of Department of Space applicable at Ahmedabad (SAC SOR) – 2014-15
19	2(xii)	Department / Institute	Institute for Plasma Research
20	9(ii)	Standard Contract Form	Item Rate Tender as per tender document

Clause – 1	
i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance	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.	Chairperson I-CDC IPR

Clause – 2A	Whether Clause 2A shall be applicable	***NO***

Clause – 5	Number of days from the date of issue of WO for reckoning date of start.	***7 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) Work order	Amount to be with-held in case of non-achievement of milestone
	-	-	-
	-	-	-
	-	-	-
	-	-	-
TIME ALLOWED FOR EXECUTION OF WORK			**110 Days (including monsoon period , if any)**

Authority to decide:

(vi) Extension of time : **Chairperson I-CDC, IPR**

(vii) Rescheduling of mile stones : **Chairperson I-CDC, IPR**

(viii) Shifting of start in case of delay in handing over site : **Chairperson I-CDC, IPR**

Clause applicable – (6 or 6A):	Clause 6 for Manual Billing or Clause 6A for Computerized Billing	***Clause 6A*** : Computerized Billing is applicable

Clause – 7	Gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.	***Monthly Running Bill***

21 Clause – 10A:	List of testing equipment's to be provided by the contractor at site lab
	1. Vernier Caliper – 1 No. 2. Steel Tapes – 3 m & 30 m two no's each 3. Plumb bob 4. Sprit level 5. Auto level machine 6. Wire Gauge circular type 7. Megger 8. Plastic Bags for samples 9. Electrical tool kit
Clause – 10B(ii): Mobilization Advance	Not Applicable

Clause – 10B(iii):Plant Machinery & Shuttering Material Advance	Not applicable

Clause – 10C:	Component of labour expressed as percent of value of work	***25%***

Clause – 10CA: Not applicable			
Sr. 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 and its corresponding period of all the materials covered under clause 10CA***
	Not applicable	***Not applicable***	***Not applicable***

***Includes Cement component used in RMC brought at site from outside approved RMC Plants, 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:*This CLAUSE NOT APPLICABLE*			
Clause 10 CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column.		***This CLAUSE NOT APPLICABLE***	
Schedule of component of other materials, labour etc. for price escalation.			
	Component of civil (except materials covered under clause 10CA) / Electrical construction value of work:	Xm	**---%**
	Component of Labour	Y	**---%**

Note: Xm percentage should be equal to (100) – (Materials covered under clause 10CA i.e. cement, still, POL and other materials specified in clause 10CA +component of Labour)

Clause – 11:	
Specifications to be followed for execution of this work	**Tender *Specifications***

Clause – 12: Type of Work -Maintenance Work		
12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 **(i)** Superstructure & foundation work (except items mentioned in earthwork and related items)	**30 %**
	(ii) Items mentioned in earth work and related items.	**100%**

Clause – 16:	Competent Authority for deciding reduced rates :	**Chairperson I-CDC, IPR**

Clause – 18:	List of mandatory machinery, tools & plants to be deployed by the contractor at site	

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 25	Constitute of Dispute Redressal Committee (DRC)	**To be appointed by Director IPR as and when required.**
	Place of Arbitration	**Institute For Plasma Research (IPR), Bhat Gandhinagar- 382428 (Gujarat)**

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.	No.	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i).
1	Graduate (Degree)/ Diploma Engineer	Civil	Project Manager cum planning/ quality/Site/billing Engineer	2- 5	1	Rs. 15,000/-

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 & bitumen on the basis of Delhi Schedule Rates---------- Printed by CPWD:	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 not more than ***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 for each diameter, section and category.	***2.0% plus /minus***
D	All other materials.	**Nil**

RECOVERY RATES			
S. No.	**Description of Item**	**Rates in figures & words at which recovery shall be made from the Contractor**	
		Excess beyond permissible variation	Less use Beyond permissible variation
1	Cement OPC	***Nil***	~~***Rs.554/- per bag of 50 kg***~~
2	Cement PPC	***NIL***	~~***Rs.532/- per bag of 50 kg***~~
3	Rebar's	***Nil***	~~***Rs. 98/- per Kg.***~~

SECTION: 3

Safety Codes and labour Regulations

SECTION: 3 - (i) 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 (1 2ft.) 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 (l2ft.) 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 1/4" 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 safely 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 bore well, cement platform (0.50m x0.50 m x1.20 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 bore well , 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 bore well is drilled the entire site should be brought to the ground level.

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

(i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.

(ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

(iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

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

(i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

(ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.

(iii) Those engaged in welding works shall be provided with welder's protective eye-shields.

(iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

(v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measure 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 meters away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

(l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.

(m) The workers shall be provided with Gumboots or non-sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

(n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

(o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

(p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

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

(a) No paint containing lead or lead .Products shall be used except in the form of paste or 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 equipment's 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.

SECTION: 3 - (ii) 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 on 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.

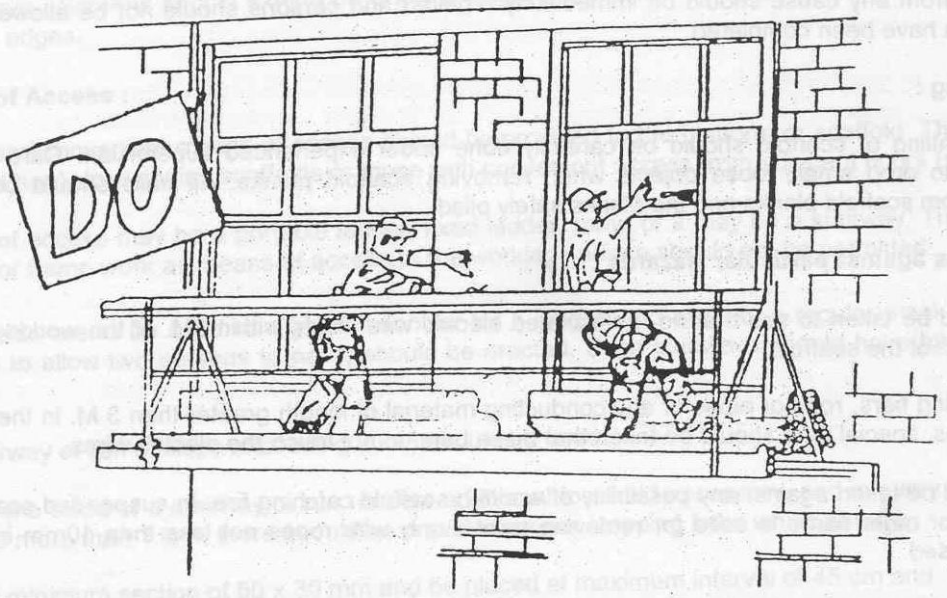
9.5 Scaffolds on thoroughfare should be provided with light.

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

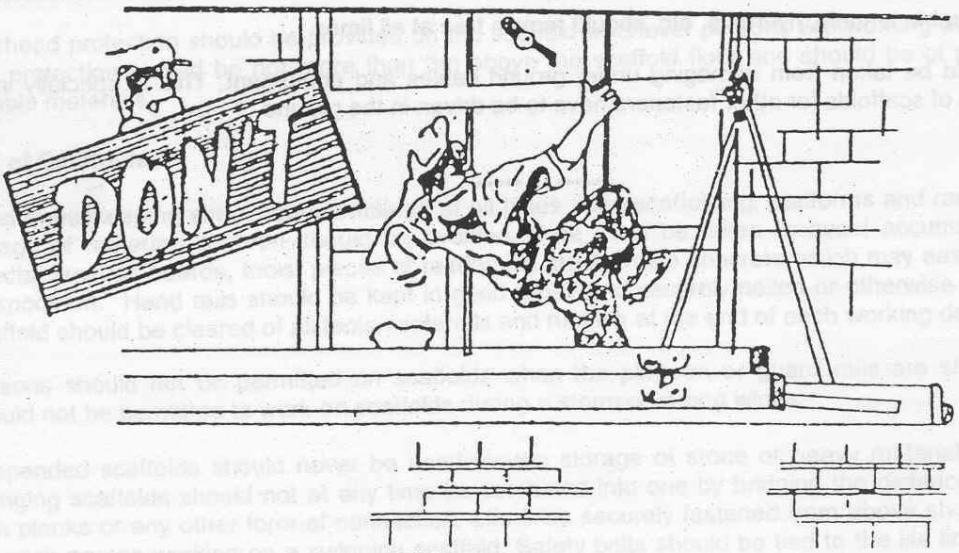
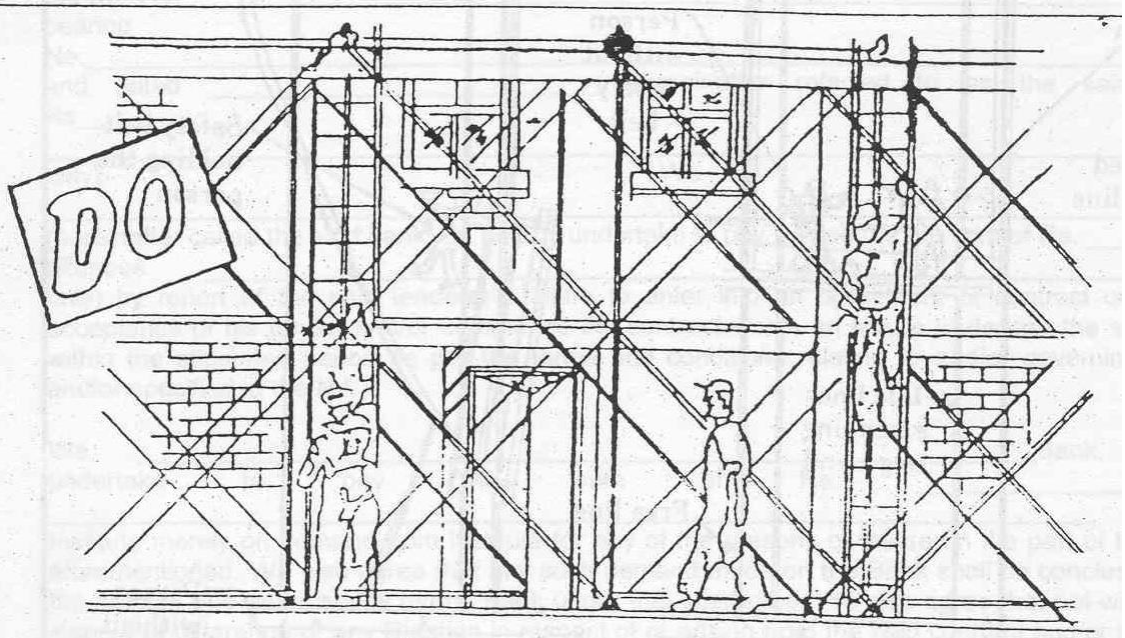


FIGURE — 1

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

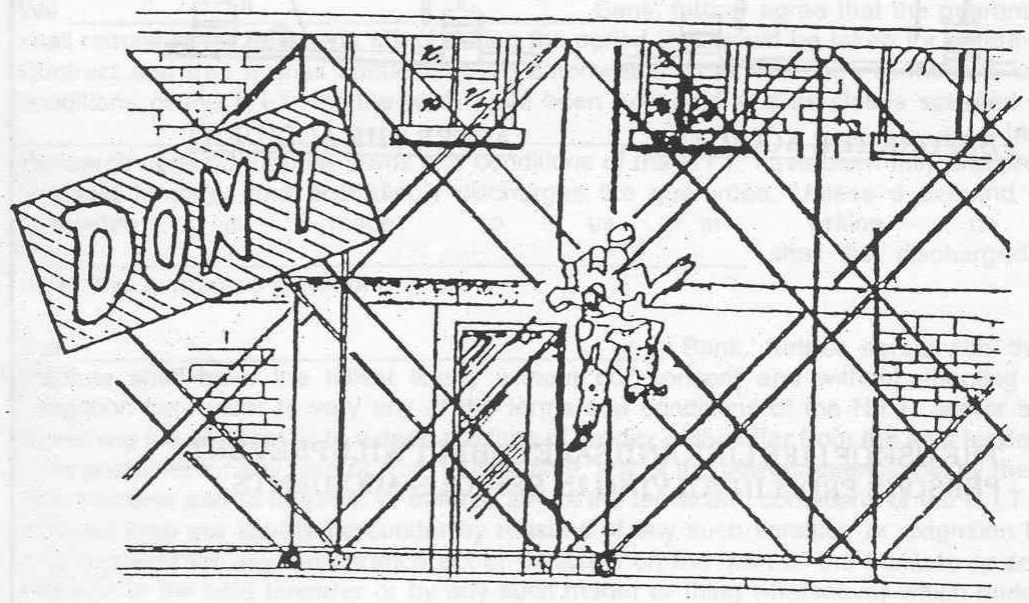
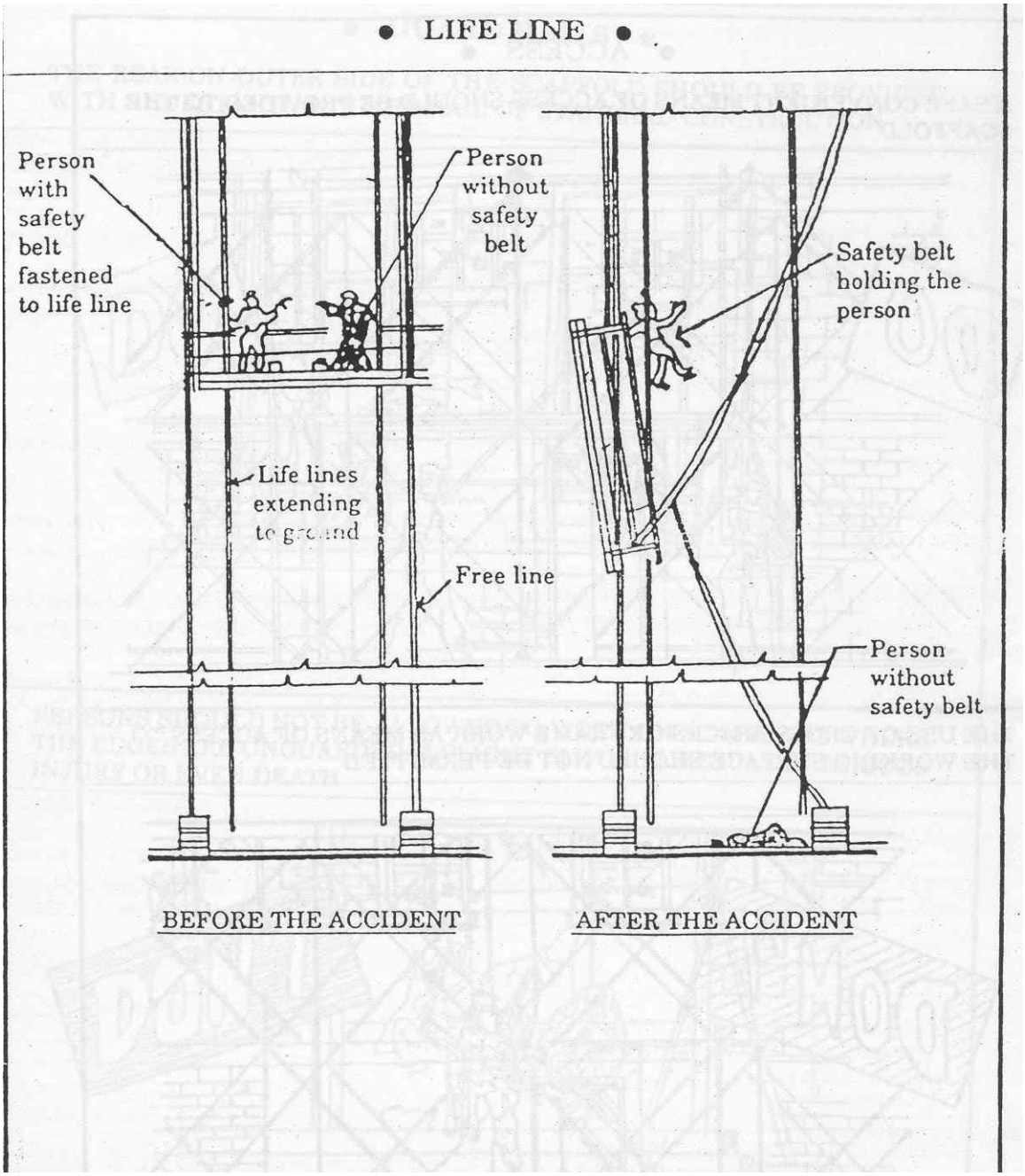


FIGURE — 2

FROM INDUSTRIAL SAFETY CHARTS-US DEPT. OF LABOUR.



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

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SECTION: 3 - (iii) 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.

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 centers/units/departments.

1.2 All the contractor while at IPR and associated centers/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 Equipment's (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 centers/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 equipment's. 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 equipment's 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 equipment's 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 equipment's 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 behavior 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 fulfill 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 centers/units/departments.

2.21 The contractor shall obtain gate pass from IPR and associated centers/units/departments for entries and exists of all materials and equipment's.

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.

CONTENTS

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 centers/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 minimize 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 centers/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 licenses, 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 equipment's 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 Equipment's (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 atworks 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 /cry/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cry, 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 tapings 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 armored 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 1/4th 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 and 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 equipment's 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.

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

5.6.2 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.

5.6.3 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.

5.6.4 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.

5.6.5 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:

5.8.1 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.

5.8.2 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/equipment shall wear safety shoes.

5.8.3 No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.

5.8.4 Entries to the demolition area shall be restricted to authorized persons only.

5.9 Welding and Gas Cutting

5.9.1 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.

5.9.2 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.

5.9.3 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.

5.9.4 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.

5.9.5 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.

5.9.6 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.

5.9.7 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.

5.9.8 Tarpaulin, if used should be of fire retardant.

5.9.9 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.

5.9.10 The cylinders containing poisonous/toxic or inflammable / explosive gas like Oxygen, Acetylene, Hydrogen, Ammonia, Chlorine, CO_2 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.

5.9.11 No domestic LPG cylinder is allowed for Hot Work such as Gas Welding / Gas Cutting.

5.9.12 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.

5.10 Grinding

5.10.1 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.

5.10.2 Grinding wheels of specified diameter only shall be used on a grinder- portable or pedestal - in order not to exceed the prescribed peripheral speed.

5.10.3 Goggles shall be used during grinding operation.

5.11 Painting

5.11.1 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.

5.11.2 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.

5.11.3 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.

5.11.4 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.

5.11.5 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: (*Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)* --- --- --- --- --- ---	
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 centers/units/departments.

2.2 All the contractor while at IPR and associated centers/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 Equipment's (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 centers/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 equipment's. 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 equipment's used for electrical work, installation of electrical equipment's/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 equipment's 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 equipment's 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.The contractor has to fully be responsible for the behavior 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.

3.15 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.

3.16 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.

3.17 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.

3.18 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 centers/units/departments.

3.19 The contractor shall obtain gate pass from IPR and associated centers/units/departments for entries and exists of all materials and equipment's.

3.20 Smoking and eating/chewing of tobacco is strictly prohibited at site.

3.21 Any person under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted at work site.

3.22 Person below the age of 18 years must not be employed for any work at site

3.23 IPR may from time to time, add or amend to these protocols and issue directions.

3.24 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

CONTENTS

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 centers/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 minimize 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 centers/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

2.1Top 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 licenses, 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 equipment's 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.

2.2Contractor 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.

2.3Contractor 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 Equipment's (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. Work at height (working beyond 2.5 mtr. above ground).
ii. 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.
iii. Loading and unloading of equipment, structural materials, machineries, etc., Fabrication and erection work.
iv. Working near high voltage lines, electrical installations, etc., charging of electrical system, transformers, switch yard, switch gears, etc.
v. 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 atworks 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 /cry/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cry, 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 tapings 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 armored 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

5.2.1 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.

5.2.2 Welding and other electrical cables shall be properly routed.

5.2.3 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.

5.2.4 Cleaning of the work area at the end of the day and upon completion of work is a part of the job.

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

5.3 Fire Safety

5.2.6 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.

5.2.7 Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be kept minimum in order to avoid unnecessary accumulation of combustibles at site.

5.2.8 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.

5.2.9 Fire extinguishers shall be located at the site at appropriate places.

5.2.10 Adequate number of workmen shall be given education and training in firefighting and extinguishing methods.

5.4 Scaffolding:

5.2.11 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.

5.2.12 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.

5.2.13 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.

5.2.14 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.

5.2.15 The free length must extend by 1.5 meters above the point of landing but should not be more than 1/4th of the ladder length. No portable single ladder shall be over 9 meter in length. Metal ladders may not be used for electrical work.

5.2.16 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 and 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.

5.5.1 Working platforms of scaffolds shall have toe boards at least 15 cm in height to prevent materials from falling down.

5.5.2 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.

5.5.3 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.

5.5.4 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.

5.5.5 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.

5.5.6 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.

5.5.7 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.

5.5.8 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.

5.5.9 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.

5.5.10 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 equipment's are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

5.5 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:

5.5.1 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.

5.5.2 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.

5.5.3 All equipment's like crane, chain blocks, sling, and rope including all other material handling equipment's must have valid load test certificates.

5.5.4 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.

5.5.5 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.

5.5.6 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).

5.5.7 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.

5.5.8 Motors, gearing transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with safe guards.

5.5.9 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.

5.5.10 No crane including hydra crane shall be allowed to move on road with suspended load.

5.6 Welding and Gas Cutting

5.6.1 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.

5.6.2 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.

5.6.3 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.

5.6.4 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.

5.6.5 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.

5.6.6 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.

5.6.7 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.

5.6.8 Tarpaulin, if used should be of fire retardant.

5.6.9 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.

5.6.10 The cylinders containing poisonous/toxic or inflammable / explosive gas like Oxygen, Acetylene, Hydrogen, Ammonia, Chlorine, CO_2 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.

5.6.11 No domestic LPG cylinder is allowed for Hot Work such as Gas Welding / Gas Cutting.

5.6.12 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.

5.7 Grinding

5.7.1 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.

5.7.2 Grinding wheels of specified diameter only shall be used on a grinder- portable or pedestal - in order not to exceed the prescribed peripheral speed.

5.7.3 Goggles shall be used during grinding operation.

5.8 Electrical Equipment – Installation and/or Maintenance

5.8.1 Consider all the equipment as live before touching until they are proved to be dead.

5.8.2 Before attempting maintenance on electrical equipment, ensure electrical isolation &earthing. Follow "permit to work on electrical system" procedures.

5.8.3 Be sure about isolation by physical verification. Check isolation tags on feeders/breakers.

5.8.4 Keep electrical insulating mat/paint in front of electrical panel/ switches.

5.8.5 Inspect the equipment thoroughly before normalization.

5.8.6 Follow SIDE rule before starting maintenance work on electrical equipment. (S=Switch off, I=Isolate, D=Discharge, E=Earthing).

5.8.7 Have minimum number of cable joints and insulate properly all the cable joints.

5.8.8 If water cooling is used, ensure that water connections are fitted correctly with no chance of leakage onto HV system.

5.8.9 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.

5.8.10 Don't work alone in and around high voltage system.

5.8.11 Lifting of electrical equipment as per manufacturer's instructions.

5.8.12 Do not allow visitors to enter into high voltage zones without escorting by an authorized person.

5.8.13 Never depend on verbal communication for isolation of electrical equipment.

5.8.14 Do not wear metallic ornament while working on electrical equipment.

5.8.15 Do not overload the power cable beyond its current carrying capacity.

5.8.16 Do not insert bare wires of appliances in the plug socket.

5.8.17 Only trained, experience and authorized personnel should carrying out maintenance, repair, adjustment etc.

5.8.18 Identified tools should be used to carry out such works.

5.8.19 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: (*Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)* --- --- --- --- --- --- ---	
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 centers/units/departments.

2.2 All the contractor while at IPR and associated centers/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 Equipment's (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 centers/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 equipment's. 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 equipment's 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 equipment's 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 equipment's 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 behavior 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 centers/units/departments.

3.22 The contractor shall obtain gate pass from IPR and associated centers/units/departments for entries and exists of all materials and equipment's.

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

CONTENTS

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 centers/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 minimize 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 centers/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

2.1Top 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 licenses, 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 equipment's 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.

2.2Contractor 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.

2.3Contractor 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 Equipment's (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. Work at height (working beyond 2.5 mtr. above ground)
ii. 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.
iii. Loading and unloading of equipment, structural materials, machineries, etc., Fabrication and erection work
iv. Working near high voltage lines, electrical installations, etc., charging of electrical system,

transformers, switch yard, switch gears, etc.

v. Work on pressure vessels/lines.
vi. Work in confined space
vii. Radiography work
viii. Work related to welding, gas cutting, grinding, etc.
ix. Work with pneumatic tools/compressed air
x. 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 atworks 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 /cry/Cotton)	For body protection against chemicals, oils, cryogenics, sharp edged objects, heat, hot objects etc.
06	Gloves (Nitrile/Leather, cryogenics, 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/feetagainst 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 tapings 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 armored 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

5.5.1 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.

5.5.2 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.

5.5.3 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.

5.5.4 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.

5.5.5 The free length must extend by 1.5 meters above the point of landing but should not be more than 1/4th of the ladder length. No portable single ladder shall be over 9 meter in length. Metal ladders may not be used for electrical work.

5.5.6 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 and 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.

5.5.7 Working platforms of scaffolds shall have toe boards at least 15 cm in height to prevent materials from falling down.

5.5.8 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.

5.5.9 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.

5.5.10 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.

5.5.11 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.

5.5.12 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.

5.5.13 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.

5.5.14 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.

5.5.15 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.

5.5.16 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 equipment's 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 equipment's like crane, chain blocks, sling, and rope including all other material handling equipment's 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, CO_2 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 ionization 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: (*Describe fully, the protocol / procedure been followed including all substances, equipment and machinery being used which was related to the near miss.)* --- --- --- --- --- --- ---	
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:

6.3 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: 3 - (iv) 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 equipment's:-

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 equipment's.

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 form 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 meters (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 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 ayaa to look after the children in the crèche when the number of women workers does not exceed 50 and two when the number of women workers 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 equipment's 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 equipment's.

(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 equipment's provided for the canteen.
(c) The cost of purchase, repairs and replacement of equipment's 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 equipment's 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: 3 - (v) Contractor's Labour Regulations with Annexures.

1. SHORT TITLE

These regulations may be called the Institute Contractors Labour Regulations.

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 18 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 the wages are payable.
(iv) Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.
(v) All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
(vi) Wages due to every worker shall be paid to him direct or to other person authorized 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 authorized 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 authorized 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.
I) 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-Xl)
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 authorized 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 authorized 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 Chairperson I-CDC IPR has given his decision on such appeal.

i) The Chief Administrative Officer shall arrange payments to the labour concerned within 45 days from the receipt of the report from the Labour Officer or the Chairperson I-CDC IPR 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 authorized may appeal against such decision to the Chairperson I-CDC IPR within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the 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 in 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, authorized 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 Chairperson I-CDC , IPR 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 miss-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. Address of Enforcement officer;

SI. No.	Category	Minimum Wage fixed	Actual Wage 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.

Sr. No.	Name and surname of workmen	Age as on	Father's / Husband 's name	Nature employment / designation	Permanent home address of workmen(Village and Tehsil, Taluk and District)	Local Address	Date of commencement employment	Signature or thumb impression of Workmen	Date of termination no employment	Reason for terminations	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:

Sr. 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.

Wages period ---------- Monthly/fortnight

Sr. No	Name of workmen	Serial No. in the register of workmen	Designation/nature of work done	No. of days worked	Units of work done	Daily rate of wages price rate	Amount of wages earned						Net amount paid	Signature or thumb impression of the workmen	Initial of contractor or his repesentive
							Basic Wage	Dearness allowance	Over Time	Other Cash payments (Indicate nature)	Total	Deduction(If any Indicate nature)			
1	2	3	4	5	6	7	8	9	10	11	12	13	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 waged 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. Sr.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:

Nature and location of work:

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.

Sr.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 rule7 (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 Institute
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

Sr. No.	Name of workmen	Father's/Husband's name	Designation/nature of employment	Act/omission of which fine imposed	Date of Offence	Weather Workmen showed cause against fine	Name of person in whose presence employee's explanation was heard	Wage period and wage payable	Amount of fine Imposed	Date on which fine released	Remarks
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

Sr. No.	Name of workmen	Father's/ Husband's name	Designation/nature of employment	Particular of damage or loss	Date of damage or loss	Weather Workmen showed cause against deduction	Name of person in whose presence employee's explanation was heard	Amount of deduction Imposed	No. of Instalment	Date 0f Recovery		Remarking
										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

Sr. No.	Name of workmen	Father's/Husband's name	Designation /nature of employment	Wage period and wages payable	Date of amount of advance given	Purposed for which advance made	No. of instalment by which advance to be paid	Date and amount of each instalment Repaid	Date on which last instalment was repaid	Remarks
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

Sr. No.	Name of workmen	Father's/Husband's name	Sex	Designation/ nature of employment	Dates on which overtime worked	Total over time worked on production in case of price rated	Normal rates of wages	Overtime rates of wages	Overtime earning	Rates on which overtime paid	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

APPENDIX XV

Note for appointment of Arbitrator [Refer Clause 25]

To
The Director, Institute for Plasma Research, Bhat, Gandhinagar –382 428

Dear Sir,
In terms of clause 25 of SECTION -2-(ii)-CLAUSES OF CONTRACT, GENERAL CLAUSES OF CONTRACT (GCC) 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 initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to Chairperson I-CDC for decision
17. Date of receipt of Chairperson I-CDC 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.

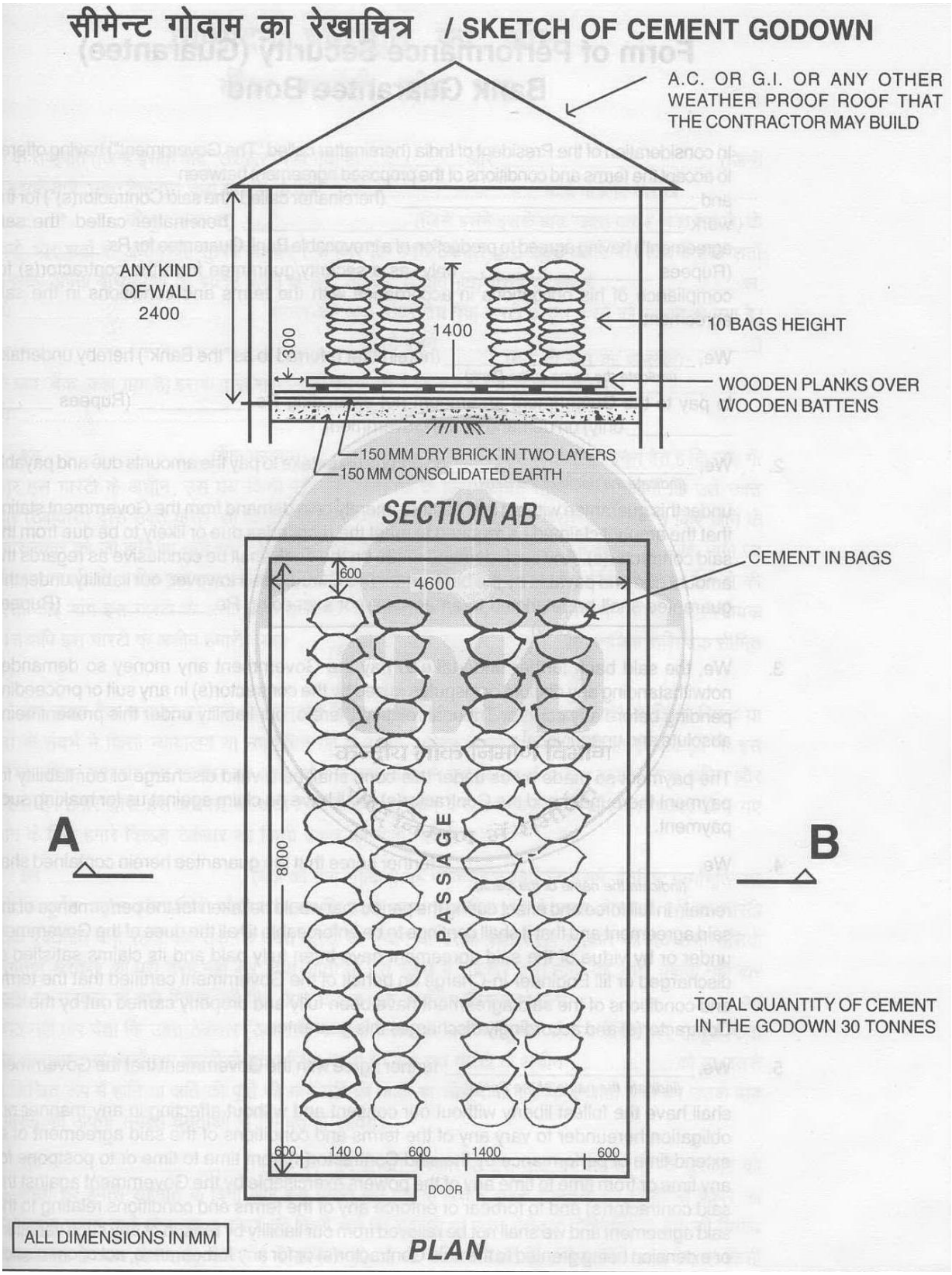
1. Statement of claims with amount of claims.
2.

Yours faithfully,

(Signatures)

Copy in duplicate to: The Chairperson I-CDC of Institute,

सीमेन्ट गोदाम का रेखाचित्र / SKETCH OF CEMENT GODOWN



SECTION: 4

Format / Performa/ 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 the construction of…….…….…….. (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(Name and division of Executive Engineer)) **(hereinafter called the Engineer-In-Charge)** in the sum of Rs……(Rs. In worlds…….) 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 notification 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 substantiates 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 extended by the 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…… SEAL
(SIGNATURE, NAME AND ADDRESS)

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

Form of Performance Security (Guarantee)
Bank Guarantee Bond

Inconsideration of the Director ,IPR (hereinafter called The Institute) having offered to accept the terms and conditions of the proposed agreement between **Institute For Plasma Research, Bhat, Gandhinagar** and _____ (hereinafter called "the said Contractor(s)") for the work _____ _____ (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 to pay to the Institute an amount not exceeding Rs. _____ (Rupees only) on demand by the Institute.

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, _____ (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Institute / Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of 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 Institute/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 Institute/Government or any indulgence by the Institute/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 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)

Form of Mobilization advance (Guarantee)
Bank Guarantee Bond

Inconsideration of the Director ,IPR (hereinafter called The Institute) having offered to accept the terms and conditions of the proposed agreement between **Institute For Plasma Research, Bhat, Gandhinagar** and _____ (hereinafter called "the said Contractor(s)") for the work of _____ _____ (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 Mobilization advance to 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 Institute.

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 there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, _____ (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Institute / Government under or by virtue of the said agreement for Mobilization advance including interest have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge 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 Institute/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 Institute/Government or any indulgence by the Institute/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) agree that in case of encashment of this Bank Guarantee, the requisite amount shall be drawn in favour of " Institute for Plasma Research, Bhat, Gandhinagar" or any other authority as demanded by him and shall be payable by demand draft at location specified by him at such time.

8. 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.

9. 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. _____ (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 execute of a certain specified quantity of work in a given time.)

Institute for Plasma Research
State: Gujarat **Administration:** Institute for plasma research

THIS INDENTURE made the _____day of _____20 _____ BETWEEN (hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors, administrators and assigns) of the one part and the Institute (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 Rupees _____ 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 Engineer-in charge 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 thereon 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 not-withstanding 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 Project Administrator / Associate Dean/ Dean / 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

By the order and direction of the Institute in the presence of:

Signature
Name
Address
Witness

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 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 inter alia 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____ and by _____and for and on behalf of the 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 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 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, overhead 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 overhead 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 Engineer-in-Charge 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 Engineer-in-Charge 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 Engineer-in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____ and by _____and for and on behalf of the 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 INSTITUTE FOR PLASMA RESEARCH BY _____ _____, in the presence of:

1.
2.

SECTION: 5

List of Drawings

Section – 5: List of Drawings: (Drawings separately attached)

List of Drawings:

Sr No.	Drawing No.	Description of Drawing

SECTION: 6

Applicable Standards/ Approved Makes/ Detailed Specifications

SECTION – 6 - (i) - Applicable Standards - Civil & Plumbing Works

Applicable Standards for Civil & Plumbing Works

1	Conversion factors	IS:786
2	Method of measurement of building works	IS:1200
3	Code of practice for measurement of civil engineering works	IS:3385
4	Materials and workmanship for earthwork and excavation	IS:1200 (PART I)
5	Safety code for blasting and related drilling operations	IS:4081
6	Safety code for excavation work	IS:3764
7	Moisture content in sand for filling	IS:2720
8	Determination of moisture content	IS:2720 (PART II)
9	Determination of moisture content & dry density relation using light compaction	IS: 2720 (PART VIII)
10	Determination of dry density of soils in-place by the sand replacement method	IS:2720(PART XXVIII)
11	Determination of dry density of soils in-place by the core cutter method	IS:2720 (PART XXIX)
12	Anti-termite treatment	IS:6313(PARTI TO III)
13	Construction water	IS:456
14	Methods of sampling and test (physical and chemical water used in industry)	IS:3025
15	Ordinary (33 grade)/low heat Portland cement	IS:269
16	Ordinary Portland cement (43 grade)	IS:8112
17	Ordinary Portland cement (53 grade)	IS:12269
18	White Portland cement	IS:8042-E
19	Portland pozzolana cement	IS:1489
20	Rapid hardening Portland cement	IS:8041, IS:269
21	Portland(blast furnace) slag cement	IS:455
22	Hydrophobic cement	IS:8043
23	High alumina cement	IS:6452
24	Super sulphated cement	IS:6909
25	Oil well cement	IS:8229E
26	Standard for testing of cement	IS:650
27	Methods of physical tests for hydraulic cement	IS:4031
28	Specification for standard sand for testing of cement	IS:650
29	Coarse and fine aggregates for concrete	IS:383, IS:515
30	Gradation of coarse aggregates	IS:383(TABLEII)
31	Gradation of fine aggregates	IS:383 (TABLE III)
32	All-in-aggregates	IS:383 (TABLE IV)
33	Method of tests for aggregates for concrete	IS:2386 (PART I TO VIII)
34	Methods of determination the maximum qty. of deleterious materials in aggregate	IS:2386 (PART II)
35	Limiting values of the maximum quantities of deleterious materials in aggregate	IS:383 (TABLE I)
36	Flakiness index of aggregates	IS:2396 (PART I), IS:5640
37	Moisture content test for aggregates	IS:2386 (PART III)
38	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.	IS:432 (PART I & II)

39	Specification for plain hard drawn steel wire fabric for cement concrete	IS:1566
40	Specification for cold twisted steel bars for concrete reinforcement	IS:1786
41	Specifications for hot rolled mild steel and medium tensile steel deformed bars	IS:1139, IS:1739
42	Code of practice for bending and fixing of bars for concrete reinforcement	IS:2502
43	Mild steel binding wire	IS:280
44	Code of practice for welding of mild steel bars used for RCC	IS:2751
45	Code of practice for plain and reinforced concrete	IS:456
46	Code of practice for general construction of plain and RCC for dams	IS:457
47	Testing of reinforced cement concrete	IS:516
48	Method of tests for strength of concrete	IS:516
49	Methods of sampling & analysis of concrete	IS:1199
50	Code of practice for concrete structures for storage of liquids	IS:3370 (PART I TO IV)
51	Code of practice for composite construction	IS:3935
52	Code of practice for construction of reinforced concrete shell roof	IS:2204
53	Criteria for the design of RCC shell structures and folded plates	IS:2210
54	Specification for batch type concrete mixers	IS:1791
55	Specification for portable swing weigh batchers for concrete	IS:2722
56	Specification for roller pan mixer	IS:2438
57	Specification for concrete vibrators immersion type	IS:2505
58	Specification for screed board concrete vibrators	IS:2506
59	Specification for concrete vibrating tables	IS:2514
60	Specification for pan vibrators	IS:3366
61	Specification for form vibrators for concrete	IS:4656
62	Code of practice for use of immersion vibrators for consolidated concrete	IS:3558
63	Air entraining agent	ASTM:6260
64	Criteria for design and construction of precast concrete trusses	IS:3201
65	Prestressed concrete	IS:1343
66	Specification for high tensile steel bars used in code of practice for pre-stressed concrete	IS:2090
67	Specification for plain hard drawn steel wire for pre-stressed concrete	IS:1785 (PART I)
68	Specification for plywood for concrete	
69	Shuttering work	IS:4990
70	Code of practice for steel tubular scaffolding	IS:4014 (PART I & II)
71	Specification for steel scaffolding	IS:2750
72	Safety code for scaffolds and ladders	IS:3696
73	Common burnt clay building bricks	IS:1077
74	Classification of burnt clay bricks	IS:3102
75	Burnt clay building bricks, heavy duty	IS:2180
76	Burnt clay facing bricks	IS:2691,IS:1077
77	Method of sampling and testing clay building bricks	IS:3495 (PART I - IV)
78	Mortar for brick work	IS:2250
79	Code of practice for brick work	IS:2221
80	Masonry works	IS:3466
81	Structural safety etc. Of building masonry walls	IS:1905
82	Load bearing hollow concrete blocks	IS:2185
83	Lime - cement - cinder hollow concrete blocks	IS:5498
84	Lime - cement - cinder solid blocks	IS:3115
85	Code of practice for construction of stone masonry	IS:1597 (PART I)

86	Stone tests	IS:1124
87	Code of practice for design and installation of joints in buildings	IS:3414
88	Joint sealing compound	IS:834
89	Pre-molded bituminous joint filler	IS:1838
90	Timber door, window and ventilator frames	IS:4021
91	Material & workmanship for wood work	IS:883, IS:4021
92	Wooden flush door shutters (solid core type)	IS:2202 (PART I)
93	Timber paneled and glazed shutters	IS:1003 (PART I & II)
94	Method of tests for wooden flush doors, type tests	IS:4020
95	Plywood & tests	IS:303
96	General tests for wood work	IS:1659
97	Red lead for wood knot	IS:103
98	Oil type wood preservative	IS:218
99	Particle board	IS:3087
100	Transparent sheet glass for glazing & framing purposes	IS:1761
101	Resin bonded fiber glass	IS:3144
102	Putty for glazing	IS:420
103	Steel door frames	IS:4351
104	Steel window	IS:1361
105	Steel doors	IS:1038
106	Steel ventilators	IS:1081
107	Rolling shutters	IS:6248
108	Primer for steel doors, windows & ventilators	IS:102
109	Aluminum alloy for door/window frames	IS DSGN. HEA-WP OF IS:733
110	Sections	IS:1948
111	Anodizing	BS:1616
112	Hydraulic lime & storage	IS:712
113	General tests for lime	IS:6932 (PART I TO X)
114	Field tests for lime	IS:1624
115	Lime mortar preparation	IS:1625
116	Slacked lime	IS:1639
117	Surkhi	IS:1344
118	Code of practice for application of lime plaster finish	IS:2394
119	Rough cast plaster	IS:1661(CLAUSE-165)
120	Specification for integral cement water proofing compounds	IS:2645
121	Water proofing asphalt/maxphalt	IS:702
122	Bitumen saturated layer	IS:1322
123	Bitumen felt	IS:1322
124	Bitumen	IS:702
125	Code of practice for laying and finishing of cement concrete flooring tiles	IS:1443
126	Material & workmanship for flooring	IS:1197, IS:1344
127	Code of practice for laying in situ terrazzo floor finish	IS:2114
128	Code of practice for laying in-situ cement concrete flooring	IS:2571
129	Mosaic tiles	IS:1237
130	Glazed earthenware tiles	IS:777
131	Marble chips & marble mosaic terrazzo	IS:2114
132	Plain cement tiles & tests	IS:1237
133	Marble mosaic tiles	IS:1237
134	Marble slab	IS:1130
135	PVC flooring tiles & sheets	IS:3461,IS:3462

136	Broken marble mosaic tiles	IS:1257
137	Oxy-chloride	IS:658
138	Magnesium chloride	IS:657
139	C.I. grid tiles	IS:210
140	Pigment for terrazzo flooring	IS:459
141	Rivets	IS:1148
142	Electrodes for welding	IS:814
143	Code of practice for use of electric arc welding for general construction in steel	IS:813
144	Tests for welding works	IS:1181
145	Welding works	IS:816
146	Bolts and nuts	IS:1367
147	Tests for bolts and nuts	IS:1608
148	Structural steel sections & tests	IS:226
149	Structural steel plates	IS:2062
150	Defects in structural steel	IS:229
151	Dimension & properties of steel section	IS:808
152	Structural steel work	IS:226, IS:4948
154	Expanded metal steel sheet	IS:412
155	Mild steel wire gauze jali	IS:280
156	Welding procedure & edge preparation	IS:823
157	Washers	IS:2016
158	Storage of welding wire & electrodes	IS:816
159	Primer to structural surface for bolts	IS:2074
160	Checkered plates	IS:3502
161	Code of practice for painting of ferrous metal in building and allied finishes	IS:1477 (PART I & II)
162	Distemper and dry colour	IS:427
163	Code of practice for painting concrete, masonry and plaster surfaces	IS:2395
164	Distemper and oil emulsion	IS:428
165	Enamel paints	IS:2933
170	Coat of zinc chromate	IS:104
171	French spirit polish	IS:348
172	GI sheets	IS:227
173	Ac sheets	IS:459
174	Ac sheet fixing	IS:730
175	Mangalore pattern tiles	IS:654
176	Fiber glass reinforced polyester	IS:4154
177	Galvanized steel for barbed wire	IS:278
178	Insulation of hot water pipes, tanks & heat exchanger	BS:476
179	GI pipes & MS tubes	IS:1239 (PART I)
180	Screw down bib cocks & stop cocks	IS:781
181	Vitreous sanitary fixtures(general)	IS:2556 (PART I)
182	Gun metal wheel, globe, check, gate & non return valves	IS:778
183	Wash basin	IS:2556 (PART IV), IS:771
184	European W.C.	IS:2556, IS:771
185	Solid plastic seat & cover	IS:2548
186	Orissa pan W.C.	IS:2556 (PART III)
187	Squatting pans & traps	IS:2556 (PART III)
188	Indian W.C. (wash down W.C.)	IS:2556 (PART II), IS:771
189	Urinals	IS:2556 (PART VI)
190	Half round channels	IS:2556 (PART VII)

191	Specific requirements of siphonic wash down W.C.	IS:2556 (PART VIII)
192	Ss sink/C.I./flushing tank brackets	IS:775
193	C.I. siphonic flushing cistern	IS:774
194	Lead pipes	IS:404 (PART I)
195	Sand cast pipes & fittings	IS:1729
196	C.I. spun soil pipes & fittings	IS:3939
197	Gully trap	IS:651
198	Glazed stone ware pipes & fittings	IS:651
199	Ac pipe	IS:1626,IS:1626 (PART I)
200	High pressure/crydon ball valve	IS:1703
201	C.I. sluice valve	IS:780
202	Capstan head	IS:1795
203	Malleable iron fittings	IS:1879 (PART I TO X)
204	C.I. pipes	IS:1536, IS:1537
205	Molten (pig)lead	IS:782
206	C.I. manhole frames & covers	IS:1726
207	Concrete pipes	IS:458
208	Threads for screwed pipes	IS:554
209	Lead jointing	IS:718
210	Carbon steel for pipes	IS:9161
211	Low level ceramic cistern	IS:774
212	Bowl pattern flat back urinals	IS:2556 (PART IV)
213	Showers	IS:2064
214	Heavy C.I. pipes	IS:1729
215	Concrete mix design	IS:10262
216	Code of practice for construction of floor and roof with joists and filler blocks	IS:6061 (PART I)
217	Code of practice for construction of light weight concrete block masonry	IS:6042
218	Specification for load bearing light weight concrete blocks	IS:3590
219	Code of practice for construction of hollow concrete block masonry	IS:2572
220	Specification for concrete masonry units (hollow and solid concrete blocks)	IS:2185 (PART I)
221	Chemical composition of ordinary Portland cement	IS:4032
222	Sulphate resistant cement	BS:4027 & ASTMC-150 TYPE II
223	Specifications for circular hollow sections	IS:1161
224	Properties of rectangular & square hollow sections	IS:4923
225	Cold formed welded & seamless carbon steel structural tubing	ASTMA 500
226	Cold but not formed welded & seamless carbon steel structural tubing	ASTMA 501
227	Hot formed welded & seamless high strength low alloy tubing	ASTMA 618
228	Hot rolled structural steel hollow section	BS:4848/

SECTION – 6 - (ii) - Cement Consumption

	Item	Ratio / Grade	Consumption
A.	**CEMENT CONCRETE**		
	BBCC	01:06:12	2.3 Bags/m3.
		01:05:10	2.6 Bags/m3.
		01:04:08	3.4 Bags/m3.
	PCC	01:06:12	2.3 Bags/m3.
		01:05:10	2.6 Bags/m3.
		01:04:08	3.4 Bags/m3.
	RCC		
		01:03:06	4.3 Bags/m3.
		01:02:04	6.4 Bags/m3.
		01:1.5:03	8 Bags/m3.
		01:01:02	12.2 Bags/m3.
		01:02:05	5.4 Bags/m3.
		01:2.5:05	5.1 Bags/m3.
B.	**MORTARS**		
	Cement and Sand mortar		
		01:01	20.4 Bags/m3.
		01:02	13.6 Bags/m3.
		01:03	10.2 Bags/m3.
		01:04	7.6 Bags/m3.
		01:05	6.2 Bags/m3.
		01:06	5 Bags/m3.
		01:08	4 Bags/m3.
	Gauged mortar		
	(Cement Lime and Sand mortar)		
		01:01:06	4.9 Bags/m3.
		01:01:08	3.8 Bags/m3.
		01:02:09	3.3 Bags/m3.
		01:05:10	2.95 Bags/m3.
		01:06:12	2.4 Bags/m3.
C.	**MASONRY WORK**		
	Brickwork in Cement sand mortar	**Modular (19 x 9 x 9)**	
		01:03	2.55 Bags/m3.
		01:04	1.9 Bags/m3.
		01:05	1.56 Bags/m3.
		01:06	1.27 Bags/m3.
		01:08	0.95 Bags/m3.
	Brickwork in Gauge Mortar		
		01:01:06	1.21 Bags/m3.
		01:01:08	0.96 Bags/m3.
		01:02:09	0.81 Bags/m3.
	Stone masonry, Uncoursed		
	Random Rubble walling	**Conventional (23 x 11 x 7)**	
		01:03	2.95 Bags/m3.
		01:04	2.29 Bags/m3.
		01:06	1.51 Bags/m3.
		01:08	1.18 Bags/m3.

	Item	Ratio/Grade	Consumption	
	Stone masonry in Gauged Mortar			
		01:01:06	1.48	Bags/m3.
		01:01:08	1.14	Bags/m3.
		01:02:09	0.99	Bags/m3.
D.	**PLASTERING**			
	12 mm. thick plaster in Cement mortar, on Brick masonry			
		01:02	0.24	Bags/m².
		01:03	0.17	Bags/m².
		01:04	0.14	Bags/m².
		01:05	0.1	Bags/m².
		01:06	0.09	Bags/m².
	12 mm. thick plaster in Gauged mortar, on Brick masonry			
		01:01:08	0.07	Bags/m².
		01:02:09	0.06	Bags/m².
	12 mm. thick plaster in Cement mortar, on Stone masonry			
		01:02	0.31	Bags/m².
		01:03	0.22	Bags/m².
		01:04	0.17	Bags/m².
		01:06	0.11	Bags/m².
	12 mm. thick plaster in Gauged mortar, on Stone masonry			
		01:01:08	0.08	Bags/m².
		01:02:09	0.07	Bags/m².
	20 mm. thick plaster in Cement mortar, on Brick masonry			
		01:02	0.34	Bags/m².
		01:03	0.24	Bags/m².
		01:04	0.19	Bags/m².
		01:05	0.13	Bags/m².
		01:06	0.12	Bags/m².
	20 mm. thick plaster in Gauged mortar, on Brick masonry			
		01:01:08	0.1	Bags/m².
		01:02:09	0.08	Bags/m².
	20 mm. thick plaster in Cement mortar, on Stone masonry			
		01:02	0.41	Bags/m².
		01:03	0.29	Bags/m².
		01:04	0.22	Bags/m².
		01:06	0.14	Bags/m².
	20 mm. thick plaster in Gauged mortar, on Stone masonry			
		01:01:08	0.11	Bags/m².
		01:02:09	0.09	Bags/m².
	20 mm. thick Sand Face plaster		0.2	Bags/m².
	12 mm. thick Water Proof plaster in 1:4 Cement mortar		0.15	Bags/m².
	Neat Cement finishing		0.044	Bags/m².
E.	**POINTING**			
	Flush, Grooved or Struck in Cement Brick masonry			
		01:01	0.06	Bags/m².
		01:02	0.05	Bags/m².
		01:03	0.03	Bags/m².
		01:04	0.028	Bags/m².
	Flush, Grooved or Struck in Cement Random Stone masonry			
		01:02	0.01	Bags/m².
		01:03	0.08	Bags/m².
		01:04	0.06	Bags/m².

	Item	Ratio/ Grade	Consumption	
F.	**FLOORING**			
	Precast Mosaic Tiles in cement mortar		0.2	Bags/m².
	Precast Mosaic Tiles dado in cement mortar		0.23	Bags/m².
	Green and Brown Kotah Stone in flooring, skirting & dado		0.3	Bags/m².
	Green Kotah Stone in Risers and Treads		0.3	Bags/m².
	Double Polished Kotah Stone		0.3	Bags/m².
	Rough Kotah Stone		0.3	Bags/m².
	Glazed Tiles		0.2	Bags/m².
	Spartek Tiles		0.2	Bags/m².
	China mosaic		0.22	Bags/m².
	Marble Slab		0.25	Bags/m².
	Granite Slab		0.25	Bags/m².
	Jesalmer		0.25	Bags/m².
	Red Mandana		0.35	Bags/m².
	I.P.S,	40 mm. thick	0.35	Bags/m².
		50 mm. thick	0.4	Bags/m².
	Pinkish White Dholpur		0.15	Bags/m².
	Red Dholpur		0.15	Bags/m².
	Brick-on-edge		0.31	Bags/m².
	Terrazzo		0.17	Bags/m².
G.	**STEEL WORK**			
	Fixing Windows in C.C Blocks 15 x 10 x 10 cm. in C.C	01:03:06	0.03	Bags/m².
	Fixing Holdfasts in C.C Blocks			
	15 x 15 x 30 cm. in C.C	01:03:06	3.3	Bags/100 nos.
	23 x 25 x 30 cm. in C.C	01:03:06	7.76	Bags/100 nos.
	30 x 30 x 45 cm. in C.C	01:03:06	19.8	Bags/100 nos.
H.	**MISCELLANEOUS**			
	Filling Zaris with			
	C.M.	01:03	5	Bags/100 nos.
	C.C	01:02:04	3.2	Bags/100 nos.
	BBCC 1:5:10 Blocks, 30 x 30 x 50 cm. for Wire fencing		5.1	Bags/100 nos.
	C.C Blocks for Flooring, 30 x 30 x 30 cm.	01:04:08	5	Bags/100 m².
I.	**ROADWORK**			
	Precast Curbs of P.C.C	01:02:04	21.5	Bags/100 m.
J.	**SANITARY WORK**			
	R.C.C Hume pipes jointed with Cement mortar 1:1			
		600 mm. dia.	6.4	Bags/100 m.
		450 mm. dia.	4.8	Bags/100 m.
		300 mm. dia.	2.2	Bags/100 m.
		230 mm. dia.	1.8	Bags/100 m.
		150 mm. dia.	1.2	Bags/100 m.
		100 mm. dia.	1	Bags/100 m.
	SW pipes jointed with Cement mortar 1:1			
		300 mm. dia.	12.94	Bags/100 m.
		230 mm. dia.	9.74	Bags/100 m.
		150 mm. dia.	6.56	Bags/100 m.

	Item	Ratio/ Grade	Consumption	
		100 mm. dia.	4.34	Bags/100 m.
	C.I Waste water line, concealed including filling the zari with	75 mm. dia.	8.6	Bags/100 m.
	Cement mortar 1:4 and joints in Cement mortar 1:1	100 mm. dia.	10.88	Bags/100 m.
	C.I Soil pipe/Rain water pipe, concealed, including filling the	100 mm. dia.	10.88	Bags/100 m.
	zari with C.M. 1:4 and joints in Cement mortar 1:1	150 mm. dia.	14.66	Bags/100 m.
	Fixing European type WC		0.1	Bag/no.
	Fixing Orissa pan			
	Fixing Urinal/s.		0.2	Bag/no.
	Fixing Wash Hand Basin		0.03	Bag/no.
	Fixing S.S Sink		0.05	Bag/no.
	Brick Masonry Chamber 300 x 300 x 610 mm.		1.7	Bag/no.
	Half Round Channel 100 mm.		15.86	Bags/100 m.
	Fixing 100 mm. dia. SW Gully Trap		0.5	Bag/no.
K.	**STORM WATER DRAINAGE & CULVERTS**			
	R.C.C. pipe NP - 2			
		230 mm. dia.	1.8	Bags/100 m.
		300 mm. dia.	2.4	Bags/100 m.
		450 mm. dia.	5.4	Bags/100 m.
		900 mm. dia.	9.8	Bags/100 m.
	Storm water Gully Chamber		6	Bag/no.

SECTION – 6 - (iii) - List of Approved Makes

A - Civil works:

1)	(a) Ordinary Portland cement (b) Port land Pozzolana cement	Ultratech, Ambuja, Binani, Birla Ultratech, Ambuja, Binani, Birla
2)	White Cement	Birla, J.K.
3)	TMT – Fe-415 / Fe-500 Ribbed bars	Tata, SAIL., RINL.Electro TMT, Friends
4)	Structural Rolled Steel sections-beams, Channels, tee, flats, angles, bars (Round, square, hexagonal)	Tata, SAIL, RINL, Jindal
5)	Structural Hollow steel sections (Square & Rectangular)	Tata, Asian, and Jindal
6)	Structural tubular sections	Tata, Asian, and Jindal
7)	Coarse Aggregates (machine cut) 6mm to 40mm sizes	approved quarry from Sevalia, Vadagam (Hard black trap stone)
8)	Stone Rubbles & Gravels	Approved quarry from Sevalia, Vadagam (Hard black trap stone)
9)	Paver block	Vyara, Super, Alcock.
10)	Shuttering plywood	Green, Archid, Duro, Century, KitPly Anchor, Pragati
11)	BWP plywood as per – IS - 710	Green, Archid, Duro, Century, KitPly Anchor,
12)	Commercial Plywood – IS – 303 (BWR/MR)	Green, Archid, Duro, Century, KitPly Anchor
13)	Decorative ply (Veneer)	Green, Durian, Century, Archid.
14)	MDF	Nuwood, Maftalal, Duratuff
15)	Prelam particle board	Novapan, Bhutan.(exterior grade only)
16)	Laminate sheet	Formica, Greenlam, Alfa-ica, Decolam, Neoluxe., Bloom
17)	Cement bonded particle board	NCL (Bison board), Everest (Eternite), Shera

18)	Calcium silicate board	Gypsum India ,Hilux
19)	Flush door – decorative / non decorative	Green, Archid, Duro, Century, KitPly Anchor,
20)	Compact sheet	Sundek, bloom, Bakelite, century, Alfica, Vir.
21)	Locks	Godrej, Dorset, Yale, EPPW, Kitch, Hafle, Dorma, Ebco
22)	Float Glass / Mirror	Modi guard, Saint gobain, Ashahi
23)	MS Rolling shutter	Sarvottam, Suryoday, Gandhi, Sona, Avians,
24)	Precast terrazo tiles & skirting (Mosaic)	Royal, Alcock, Vyara, Nitco
25)	Glazed tiles	Johnson, Kajaria, Somani, Asian, Restile, Nitco.
26)	Ceramic tiles	Johnson, Kajaria, Somani, Asian, Restile, Nitco.
27)	Vitrified clay tiles	Johnson, Kajaria, Somani, Asian, Restile, Nitco.
28)	Construction chemicals	M.C. Bauchemie, Fosroc, Sika, Cico, Pidilite/Dr Fixit, Roffe, BAL/Ardex Endura,
29)	Joint Filler / silicon paint	Wacker, Dowcorning, Sika, Chokshi
30)	Pre-coated steel roofing/cladding	Tata BlueScope colour bond, Nippon walling sheets, Meta color.
31)	Paint, primer, putty	Asian, Berger, ICI, Nerolac, Dulux, Birla (putty), Roofit (Putty)
32)	Polish	MRF, Asian, ICI, Taralac, Berger
33)	Waterstop	Arti Polymer, Fixopan
34)	Door Window & Furniture Hardware	Kitch, EPPW, Dunex, Dorma, Ebco, Palladium
35)	Adhesives	Fevicol, Kitcol, Araldite, BAL.
36)	Anchor fastener / bolts	Hilti, Fischer
37)	Linseed oil	Saffola

38)	Floor spring	Everite, Hemco, Godrej, Hyper, Haffle
39)	Door closer	Godrej, Dorma, Yale, Everite, Haffle, Kitch
40)	Aluminum sections	Jindal, Hindalco, Indal.
41)	Aluminum finish	20 micron color anodized /50micron pure polyester powder coating - Contractor shall provide the micron thickness measuring equipment at site through out the work during progress for checking the anodizing/powder coating thickness. Visibly should looks uniform as per standards.
42)	Window locks cum handle	Kitch, EPPW, Dunex, Dorma, Ebco, Palladium
43)	Filler rubber of glass panel	EPDM quality only
44)	Wool felt/weather strip	shall be imported of Italy make
45)	False ceiling	M/s. Hunter Douglas India Pvt. Ltd.
46)	Insulation	M/s Bakelite Hylum,

B - Plumbing works:

1)	Sanitary wares	CERA / HINDUSTAN
2)	CP Fixtures AND ACCESSORIES	JAQUAR - CONTINENTAL
3)	Half-turn flush-cock	PRINCE heavy quality CROWN Heavy quality
4)	Flush-Valve	Jaquar, CROWN
5)	GI Pipes	TATA, Asian, Jindal
6)	GI fittings & Specials	R BRAND, DRP
7)	Valve with gun metal construction	Zoloto, L & T audco, Leader
8)	Plastic control valve	DPP, PRINCE, Prayag
9)	CI Pipes & fittings	NECO, BIC

10)	UPVC Pipes & fittings	Supreme, FINOLEX, Prince, Astral Dutron, Ashirwad
11)	Stoneware Pipes & fittings	Girish or best quality as approved by the architect or EIC
12)	SS Sink	Nirali
13)	PVC Seats	COMMANDER, HINDWARE, CERA
14)	CI Manhole cover, frame and grating	NECO, BIC
15)	Float/Equilibrium Valves With Copper Floats	HAWA, Glenfield
16)	Polyethylene composite pressure pipe	KITEC
17)	Copper pipe	IBP-NECO, Rajco
18)	Pressure tank (Bladder type)	WELLMATE
19)	HDPE pipe and fittings	Hasti – PIL, DUTRON, WAVIN
20)	RCC Hume pipe and fittings	Patel Hume pipes, ALCOCK, INDIAN HUME PIPE or as approved by EIC
21)	PVC water tank	SINTEX

NOTE:

(i) All materials shall conform to the relevant standards or Code of Bureau of Indian standards and shall have ISI mark validated for the period of installation and take over. They shall also fulfil all hydraulic tests at site and shall be free from all noticeable deficiencies during the guarantee period as well.

(ii) All the Materials/Makes listed above and other than as specified above shall be used after obtaining prior approval from the Architect / Engineer-in-charge.

SECTION – 6 (iv) - Material Specifications

A - Civil Works

M-1 Water :

1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalies salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in RCC container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in IS : 456.

1.2 If required by the Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in IS : 269. Any indication of unsounding change in time of setting by 30 minutes or more or decrease of more than 10 per cent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.4 Hard and bitter water shall generally be found unsuitable for curing mortar or concrete.

1.5 Potable water shall be generally found suitable for curing mortar and concrete.

Testing Standards :

A. Chemical Analysis :-

Sampling : Test shall be carried out only once for one particular source.
Results :
a) TDS - 3000 mg/lit.
b) Sulphates - 5000 mg/lit.
c) pH values - 6 to 8
d) Chlorides
P.P.C - 2000 mg/lit.
R.C.C - 1000 mg/lit.
e) Carbonic contents - 200 mg/lit.
f) Non-carbonic contents - 3000 mg/lit.

M-3 Cement :

3.1 Cement shall be ordinary Portland slag cement, grade 33, as per IS : 269, grade 43, as per IS : 8112 and grade 53, as per IS : 12269 or Portland slag cement as per IS : 455.

Testing Standards :

A. Setting time :
Sampling :

(i) From a lot of 50 tones of cement, 2% of bags shall be picked out at random, from which one sample of 15 kg. shall be taken.
(ii) For a lot of 50 to 100 tones - 2 samples
(iii) For a lot of 100 to 200 tones - 3 samples
(iv) For a lot of 100 to 200 tones - 3 samples
(v) For a lot of 200 to 300 tones - 4 samples
(vi) For a lot of 300 to 500 tones - 5 samples
(vii) For a lot of 500 to 800 tones - 6 samples
(viii) For a lot of 800 to 1300 tones - 7 samples

Results :
(a) Initial setting time - not less than 30 minutes
(b) Final setting time - not more than 100 minutes

B. Fineness test by Sieving :
Sampling : Using any 5 samples, made as above, one test is carried out, using IS sieve no. 90 microns.
Results : 90% or more should pass through the above mentioned IS sieve.

C. Fineness test by determination of specific surface :
Sampling : Using any 5 samples, made as above, one test is carried out.
Results : For O.P.C, the surface area shall be 225 cm^2/gm. or more.
For P.P.C, the surface area shall be 3000 cm^2/gm.

D. Consistency test :
Sampling : Sampling shall be as in A.
Results : Consistency in all samples shall be about 30%.

E. Compressive strength :
Sampling : Sampling shall be as in A.
Results : On 2nd day, compressive strength must be 160 Kg/cm^2., for O.P.C
On 7th day, compressive strength must be 220 Kg/cm^2., for O.P.C
On 28th day, compressive strength must be 310 Kg/cm^2., for O.P.C

F. Chemical composition (IS : 4032):
Sampling : Using any 5 samples, made as above, one test is carried out.
Results : a. Magnesium oxide - less than 6%.
b. Sulphur as Sulphuric anhydride - less than 2.75%.
c. Loss on ignition - upto 5%.

The above is for ordinary Portland cement.

M-4 White Cement :

4.1 The white cement shall conform to IS : 8042-E

M-5 Coloured Cement :

5.1 Coloured cement shall be with white or grey Portland cement mixed with pigments as specified in the item of the work.

5.2 The pigments used for coloured cement shall be of approved quality and its quantity shall not exceed 10% of the cement used in the mix. The mixture of pigment and cement shall be properly

ground to have a uniform colour and shade. The pigments shall have such properties as to provide for durability for colour under exposure to sunlight and weather.

5.3 The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

M-6 Sand :

6.1 Sand shall be medium/coarse natural sand, clean, well graded, hard, strong, durable and gritty. Sand particles should be free from injurious amounts of dust, clay, kantar nodules, soft or flaky particles of shale, alkali, salts, organic matter loam, mica or other deleterious substances and shall be got approved from the Engineer-in-charge . The sand shall not contain more than 8% of silt as determined by field test and 3% by laboratory test , if necessary the sand shall be washed to make it clean. **All sand to be used for plaster, brickwork , Reinforced concrete work shall be strictly sieved by 4.75 mm sieve.**

Testing Standards :

A. Silt Content :

Sampling : Test shall be carried out for every 150 m^3 of sand. The sample taken for testing shall weigh 10 Kg.

Results : Permissible content shall be 3% in laboratory test & 8 % in field Test.

B. Fineness Modulus :

Sampling : Sampling shall be as in A.

Results : Fine sand : 2.2 to 2.6 shall be used as earth filling in plinth, zari, etc.
Medium sand : 2.6 to 2.9 shall be sued for Brickwork and plaster.
Coarse sand : 2.9 to 3.2 shall be used for concrete.

In general, the fineness modulus of sand shall not be less than 2.5 and shall not exceed 3.0. A sand having a fineness modulus more than 3.2 will be unsuitable for making satisfactory concrete.

C. The sieve analysis of sand shall be as under

IS Sieve Designation	% By weight Passive sieve	IS Sieve Designation	% By Weight passive sieve
4.75 mm	100	600 Micron	30-100
2.36 mm	90-100	300 Micron	5-70
1.18 mm	70-100	150 Micron	0-50

M-7 Stone Dust :

7.1 This shall be obtained from crushing hard black trap or equivalent. It shall not contain more than 8% of silt as determined by field test with measuring cylinder. The method of determining silt contents by fields test is given under:

7.2 A sample of stone dust to be tested shall be placed without drying in 200 mm. measuring cylinder. The quantity of the sample shall be such that it fills the cylinder upto 100 mm. mark. Then clean water shall be added upto 150 mm. mark. The mixture shall be stirred vigorously and the contents allowed to settle for 3 hours.

7.3 The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the content within the allowable limit.

7.4 The fineness modulus of stone dust shall not be less than 1.80.

M-8 Stone Grit :

8.1 Grit shall consist of crushed or broken **hard black trap stone** and be hard, strong, dense, durable clean of proper gradation and free from skin or coating likely to prevent proper adhesion of mortar. Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of IS : 383 Unless special stone of particular quarries is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

8.2 The grit shall conform to the following gradation as per sieve analysis:

IS Sieve Designation	% passing Through sieve	IS Sieve Designation	% By Weight passive sieve
12.50 mm	100%	4.75 mm.	0-20%
10.00 mm	85-100%	2.36 mm.	0- 5%

8.3 The crushing strength of grit will be such so as to allow the concrete in which it is used to build up the specified strength of concrete.

8.4 The necessary tests for grit shall be carried out as per the requirements of IS : 2386 (parts I to VIII) , as per instructions of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-11 Cement Mortar :

11.1 Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6.

11.2 Proportion of Mix:

11.2.1 Cement and sand shall be mixed to specified proportion, sand being measured by measuring boxes. The proportion of cement will be by volume on the basis of 50Kg/Bag of cement being equal to 0.0342 m^3. The mortar may be hand mixed or machine mixed as directed.

11.3 Proportion of Mortar :

11.3.1 In hand mixed mortar. cement and sand in the specified proportions shall be thoroughly mixed dry either **mechanically in mixer machine** / manually on a clean impervious platform by turning over atleast 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

11.3.2 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 Stone Coarse Aggregate For Nominal Mix Concrete :

12.1 Coarse aggregate shall be of machine crushed stone **of hard black trap** and be hard, strong, dense, durable, clean and free from skin and coating likely to proper adhesion of mortar.

12.2 The aggregate shall generally be cubical/round in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the **hard black trap** or equivalent black hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete, the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6 mm. less the cover, whichever is smaller.

TABLE

IS Sieve Designation	% passing for single size aggregates of Nominal Size			IS Sieve Designation	% passing for single size aggregates of Nominal Size		
	40 mm	20 mm	16 mm		40 mm	20 mm	16 mm
80 mm	-	-	-	12.5 mm	-	-	-
63 mm	100	-	-	10 00	0.5	0 - 20	0.30
40 mm	100	100	-	4.75 mm	-	0 - 5	0.50
20 mm	0 -20	85 – 100	100	2.35 mm	-	-	-
16 mm	-	-	85 – 100				

Note : This percentage may be varied some what by the Engineer-in-charge when considered necessary for obtaining better destiny and strength of concrete.

12.3 The grading test shall be taken in the beginning and at the change of source of materials. The necessary tests indicated in IS : 383 and IS : 456 shall have to be carried out to ensure the acceptability. The aggregate shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust they shall be washed with water to make them clean.

Testing Standards :

A. Flakiness Index :

Sampling : For every 200 m^3. of aggregates, one test shall be carried out.

Results : The Flakiness index is taken as the total weight of the aggregates passing through the various thickness gauges, expressed as a percentage of the total weight of the sample taken. Permissible is not more than 35% for aggregates used in concrete for wearing surfaces.

B. Impact value :

Sampling : For every 100 m^3. of aggregates, one test shall be carried out.

Results : The impact value shall not be more than 45% by weight for aggregates used for concrete other than wearing surfaces.

For aggregates used for concrete to be used as wearing surface, the impact value shall not be more than 30%, by weight.

C. Abrasion Value :
Sampling : Sampling shall be as in B.
Results : The percentage of wear shall not be more than 35%.

M-13 Black Trap or Equivalent Hard Stone Coarse Aggregates for Design Mix Concrete :

13.1 Aggregate for Design Mix Concrete : Coarse aggregate shall be machine crushed stone of black trap or equivalent hard stone and hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

13.2 The aggregates shall generally be cubical in shape. Unless special stones of particular quarried are mentioned, aggregates shall be machine crushed from the best black trap or equivalent hard stones as approved. Aggregates shall have no deleterious reaction with cement.

13.3 The necessary tests indicated in IS : 383 and IS : 456 shall have to be carried out to ensure the acceptability of the material.

13.4 If the aggregates are covered with dust, they shall be washed with water to make them clean.

M-14 Brick Bats Aggregates :

14.1 Brick bat aggregate shall be broken from well burnt or slightly over burnt and dense bricks. It shall be homogeneous in texture, roughly cubical in shape, clean and free from dirt or any other foreign material. The brick bats shall be less than 40 mm. size, unless otherwise specified in the item. The under-burnt or over-burnt brick bats and brick dust shall not be allowed.

14.2 The brick bats shall be hand measured by suitable boxes or as directed.

M-15 Bricks :

15.1 The bricks shall be of **first quality** hand or machine moulded and made from suitable soils and kiln burnt. They shall be free from cracks, flaws and modules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform In colour. The bricks shall be moulded with a frog of size 100 mm. x 40 mm., and 10 mm. to 20 mm. deep on one of its flat sides. The bricks shall not break when thrown on the ground from a height of 1 m.

15.2 The size of modular bricks shall be 190 mm. x 90 mm. x 90 mm.

15.3 The size of the conventional bricks shall be (9"x4.5" x 3") 230 mm. x 110 mm. x 76.5 mm.

15.4 Only bricks of one standard size shall be used on a particular work site. The following tolerances shall be permitted in the conventional size adopted in a particular work site.
Length : + 1/8"(3.0 mm.). Width : + 1/6" (1.50 mm.). Height : + 1/6"(1.50 mm.).

15.5 The crushing strength of the bricks shall not be less than **35 Kg./cm^2.** **No unburned/over burnt bricks** shall be used for any structure. The bricks should have dimensional stability as per IS standards. The average water absorption shall not be more than 20% by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per IS : 3495 (Part I to IV) .

Testing Standards :

A. Efflorescence :
Sampling : Test of 20 bricks is carried out from a stock of 20,000 bricks.
Results : Moderate.

B. Water Absorption :
Sampling : Test of 32 bricks is carried out from a stock of 35,000 bricks.
Results : Absorption shall not be more than 20%.

C. Compressive Strength :
Sampling : Test of 50 bricks is carried out from a stock of 1,00,000 (1 Lac) bricks.
Results : On average the compressive strength shall not be less than **35 Kg/cm^2**. And every result shall not be less than 20% of the IS standards.

M-16 Stone :

16.1 The stone shall be of specified variety such as Granite/Trap Stone/Quartz or any other type of good hard stones.

The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used. The percentage of water absorption shall not be more than 5% of dry weight, when tested in accordance with IS : 1124. The minimum crushing strength of the stone shall be 200 Kg/cm^2. unless otherwise specified.

16.2 The samples of the stone to be used shall be got approved before the work is started.

16.3 The Khanki facing stone shall be dressed by chisel as specified in the item for Khanki facing in required shape and size. The face of stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.

M-18 Mild Steel Bars :

18.1 Mild steel bars reinforcement for RCC work shall conform to IS : 432 (Part-II) and shall be of tested quality. It shall also comply with relevant part of latest IS : 456.

18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust, at the time of placing.

18.3 For the purpose of payment, the bar shall be measured correct upto 10 mm. length and weight payable worked out at the rate specified below :

1.	6 mm.	0.22 Kg/m.	8.	20 mm.	2.47 Kg/m.
2.	8 mm.	0.39 Kg/m.	9.	22 mm.	2.98 Kg/m.
3.	10 mm.	0.62 Kg/m.	10.	25 mm.	3.85 Kg/m.
4.	12 mm.	0.89 Kg/m.	11.	28 mm.	4.83 Kg/m.
5.	14 mm.	1.21 Kg/m.	12.	32 mm	6.31 Kg/m.

6.	16 mm. 1.58 Kg/m.	13.	36 mm.	7.99 Kg/m.
7.	18 mm. 2.00 Kg/m.	14.	40 mm	9.86 Kg/m.

18.4 Procurement of Steel should be from authorized/approved rolling mills and test certificates should be submitted with each lot.

Testing standards :

Sampling : For every 40 tones of steel, atleast one test shall be done.
Results :

Thickness	Ultimate Tensile strength	Chilled state	% Elongation
0 - 20 mm.	42 Kg/cm^2.	26 Kg/cm^2.	23
20 - 40 mm.	42 Kg/cm^2	24 Kg/cm^2.	23
40 mm. & more	42 Kg/cm^2	24 Kg/cm^2.	23

M-19 A High Yield Strength Steel Deforms Bars :

19.A.1 High yield strength steel deformed bars be either cold twisted or hot rolled shall conform to IS : 1739 and IS : 1139 respectively.

19.A.2 Other provision and requirements shall conform to M-18 for Mild steel bars.

M-19B Thermo-mechanically Treated Bars (TMT)

19.B.1 TMT bars shall conform to IS: 1786

19.B.1 Procurement of Steel should be from authorized dealer and test certificates should be submitted with each lot.

M-19C Corrosion Resisting Steel (CRS)

19.C.1 CRS bars shall conform to IS: 1786

19.C.1 Procurement of Steel should be from authorized dealer and test certificates should be submitted with each lot.

M-20 High Tensile Steel Wire:

20.1 The high tensile wires for the use in prestressed concrete work shall conform to IS : 2090.

20.2 The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, the minimum strength shall be taken as per para 6.1 of IS : 1785. Testing shall be done as per IS requirements.

20.3 The high tensile steel shall be free from loose mill scale, rust oil, grease, or any other harmful matter. Cleaning of steel bars may be carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborundum.

20.4 The high tensile wire shall be obtained from manufactures in coil having diameter not less than 350 time the diameter of wire itself, so that wire springs back straight on being uncoiled.

Testing standards :

Sampling : For every 40 tonnes of steel, atleast one test shall be done.

Results :

Thickness	Ultimate Tensile strength	Chilled state	% Elongation
For all sizes	49.5 Kg/cm^2.	42.5 Kg/cm^2.	14.5

M-21 Mild Steel Binding Wire :

21.1 The mild steel wire shall be of 1.63 mm. or 1.22 mm. (16 or 18 gauge) diameter and shall conform to IS : 280.

21.2 The use of black wire will be permitted for binding reinforcements bars. It shall be free from rust, oil paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-22 Structural Steel :

22.1 All structural steel shall conform to IS : 226. The steel shall be well and cleanly rolled to the dimensions and weight specified by the IS, subject to the permissible tolerances as per IS : 1852. The finished materials shall be reasonably free from cracks, surface flaws, laminations, rough and imperfect edges and all other harmful defects mentioned in IS : 229 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. River bars shall conform to IS : 1148. The decision of the Engineer-in-charge regarding rejecting any steel section on account of any of the above defects shall be final and binding to the Contractor.

22.2 Structural steel shall conform to the following requirements. The mechanical and chemical properties shall be as below :

MECHANICAL COMPOSITION OF STEEL

Steel Class of designation	Nominal steel product	Thickness in mm.	Tensile strength min in Kgf/mm^2	Yield stress Kgf/mm^2	% elongation
ST-42 W &	Plates,	Below 6 mm.	Bend test only shall be required.		
ST-42 S	flats, bars.	upto 20 & cv	42 to 54	26.0	23
		Over 20 upto Vc 40	42 to 54	24.0	23
		Below 10	Bend test only shall be required.		
		10 upto 20 & Vc	42 to 54	28.0	23
		Over 20	42 to 54	24.0	23
ST-42 O	Plates,	Below 6 sections,	Bend test only shall be required.		
		flats,Over 6	42 to 54	28.0	23
		Below 10	Bend test only shall be required.		
		10 & above	42 to 54	28.0	23

CHEMICAL COMPOSITION OF STEEL

Steel designation	Maximum percentage		
	Carbon	Sulphur	Phosphorous
ST-42 W	0.23	0.06	0.06
ST-42 S	0.25/0.28	0.06	0.06
ST-42 O		0.07	0.07

22.3 The following variety of steel shall be used for structural purposes :

ST-42 S : It shall be used for all types of structure (riveted or bolted), including those subjected to dynamic loading and where fatigue, wide fluctuations of stresses, reversal of stresses and great restraint are involved. It shall be suitable for welded structures, provided that the thickness of the material does not exceed 20 mm.

22.4 When the steel is supplied by the Contractor, test certificate of the manufacture shall be obtained according to IS : 226 and other relevant Indian Standards.

M-23 Galvanised Iron Sheets :

23.1 The galvanised iron sheets shall be from Tata or equivalent of approved zinc coating class , as approved by the Engineer-in-charge. It shall be plain or corrugated, of gauge as specified in item. The GI sheets shall conform to IS : 277. The sheets shall be undamaged in carriage and handling either by rubbing off of zinc coating or otherwise, they shall have clean and bright surface and shall be free from dents, holes, rust or white powdery deposit.

23.2 The width of GI sheet shall be as directed, as per site condition.

M-26 Shuttering:

M-26A Timber/Wooden planking:

26A.1 The shuttering shall be either of wooden planking of 30 mm. minimum thickness with or without steel lining or steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams/ MS channels & MS adjustable spans and props of ballies/MS adjustable props with adjustable head properly cross braced together with 40 mm NB black MS pipes & right angle or Sewell coupler, so as to make the centering rigid. In place of ballie /MS propps , brick pillar of adequate section built in mud mortar or MS H frames, base plates may be used.

26A.2 The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration, live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

26A.3 If at any stage of work, during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

26A.4 As far as possible vertical supports shall be of steel .If wooden ballies are to be used in place of MS props ,the props shall consist of ballies having 100 mm. minimum diameter, measured at mid length and 80 mm. at thin end and shall be placed as per design requirement (prior approval shall be taken for using wooden ballies). These shall rest squarely on wooden sole plate 40 mm. thick and minimum bearing area of 0.10 m^2. laid on sufficiently hard base.

26A.5 Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

26A.6 The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planned on the sides and surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

26A.7 MS clamps ,tie rod- PVC cone spring coil -& bolt assembly shall be used for water retaining & under ground RCC works to hold the forms together and use of nails ,wires and spikes shall be avoided. & for non water retaing / above ground level concrete works, MS through tie rods PVC cones & heavy quality PVC pipes can be used .After concreting work, holes shall be filled with 1: 1 cement sand mortar with bonding agent at no extra cost.

26A.8 The surface of timber shuttering that would come on contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering, either soap solution or raw linseed oil or shuttering release agent shall be applied after thoroughly cleaning the surface. Under no circumstances, black or burnt oil shall be permitted.

26A.9 The shuttering for beams and slabs shall have camber of 4 mm. per meter (1 in 250) or as directed by Engineer-in-charge, so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the project length or as directed by the Engineer-in-charge.

M-26B Concrete Shuttering Plywood :

26B.1 It shall be made from strong and selected hard-woods. It shall be bonded with high quality Phenol Formaldehyde synthetic resin adhesive, hot pressed and then shall be further treated with a permanent type of preservative by vacuum-cum-pressure impregnation.

26B.2 Due to the bonding with Phenol Formaldehyde, it shall be moisture and weather proof. The use of selected hard-woods render hard and wear-resistant faces and thereby it shall be reusable several times. It shall be highly resistant to rot, termites and other wood inhabiting insects. Due to complete penetration of the preservative, it shall be exceedingly durable.

26B.3 It shall have high impact strength and therefore shall be used successfully in place of timber planks and steel sheets. It shall protect the concrete from rapid temperature changes and shall provide optimum conditions for setting of the concrete. As it shall possess remarkable design flexibility, it shall be ideal for curved formwork.

26B.4 Besides it shall be used as centering, shuttering and formwork of concrete columns, beams, slabs, walls, tanks, bridges, fly-overs, silos etc. It shall also be used for structural applications like external walling, roofing, flooring, curtain walls, work-site offices, in cabins of trucks, rail coaches etc.

M-26C Steel Sheeting and Steel Plates :

26C.1 Steel sheeting and steel plates should be free from clinks, twists, offsets, warps, etc. Their surface should be neat, clean and smooth. Before placing concrete, steel forms shall be thoroughly cleaned off of all rust, dust and loose materials. Colourless oil or grease of approved quality or **approved Mould releasing agents** shall be applied before placing steel.

26C.2 The size of angles used for framing and bracing of steel plates should be sufficient to withstand the weight of concrete without forming clinks, twists, offsets, warps, etc. in the welded steel plates. Also, the gauge of steel sheeting used should be minimum 14 G.(2.0mm)

26C.3 Minimum two bracing angles should be provided along with angle framing while making the steel plates. It should be riveted or welded to suit the requirement of finish concrete surface. Minimum two rivets should be provided at all Four Corners and at junction of angle framing and bracing.

26C.4 If the plates are to be welded, steel sheet and angle framing/bracing should be welded from sides and at back. Welding on sides should be buffed to make the sides smooth. Also, intermittent welding should be done to keep steel sheet and angle framing/bracing in one plane.

M-30 Wooden Flush Door Shutters (Solid Core):

30.1 The solid core type (water proof/ Commercial) flush door shutters shall be of decorative face or non-decorative face type, as specified in the drawing. The size and thickness of the shutter shall be as specified in drawings or as directed. The timber species for core shall be used as per IS : 2202-(Part-I). The timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members in which they occur, may be permitted. Pitch pockets, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross-bands shall conform to IS : 303. And waterproof plywood shall confirmed to IS 710.

30.2 The solid core shall be of wood laminates, prepared from battens of well seasoned chemically treated and treated good quality wood, having straight grains. The battens shall be of uniform size of about 2.5 cm. width. These shall be properly glued) and the block board core. Cross bands and face veneers are bonded together under heat & machine pressed together using BWP type Phenol formaldehyde synthetic resin adhesive, with grains of each piece reversed from that of the adjoining one. The longitudinal joints of the battens shall be staggered and no piece shall be less than 50 cm. in length. Edges of the core shall be lipped internally with 1st class teak wood battens of 4 cm.(1-1/2") minimum width, glued and machine pressed along with the core.

30.3 The core surface shall then have two or three veneers firmly glued on each face. The first veneer (called cross band) shall be laid with its grains at right angles to those of the core and the second and the third veneers with their grains parallel to those of the core.

30.4 The face panel of the shutters shall be formed by gluing, by the hot press process on both faces of the core with either plywood or cross-bands and face veneers. The lipping, reveting, opening of glazing, venation etc. shall be provided if specified in the drawing.

30.5 All edges of the door shutters shall be square. The shutters shall be free from twist or warp in its plane. Both faces of the shutters shall be sand papered to make smooth even texture.

30.6 The shutters shall be tested for -

(1) End immersion test : The test shall be carried out as per IS : 2202 (part-I). There shall be no delamination at the end of the test.
(2) Knife test : The face panel when tested in accordance with IS : 1659 shall pass the test.
(3) Glue Adhesion test : The flush door shall be tested for glue adhesive test in accordance with IS :2202 (Part-I) . The shutters shall be considered to have passed the test if no delamination occurs in the glue lines in the plywood and if no single delamination more than 80 mm. in length & more than 3 mm. in depth has occurred in the assembly glue lines between the plywood face and the style and rail. Delamination at the corner shall be measured continuously around the corner. Delamination at the knots, knot holes and other permissible wood defects shall not be considered in assessing the sample.

30.7 The tolerance in size of solid core type flush door shall be as under :
In Normal thickness +1.2 mm. In Normal height +3 mm.

30.8 The thickness of the shutters shall be uniform throughout, with a permissible variation of not more than 0.8 mm. when measured at any two points,

M-31 Aluminium Doors, Windows, Ventilators :

31.1 Aluminium alloy used in the manufacture of extruded window sections shall conform to IS designation HEA-WP of IS : 733 and also to IS designation WVG-WP of IS : 1285. The section shall be as specified in the drawing and design. The fabrication shall be done as directed.

31.2 The hinges shall be as approved railway or butt brass nickel plated or SS 304 of kitch or dorma or equivalent or cast or extruded Aluminium hinge of same type as in window but of larger size.

31.3 The hinges shall normally be of 100 mm. openable/projecting type. Non-projecting type of hinges may also be used, if directed. The handles of the door shall be of specified design. A suitable locks for the door, operable either from outside or inside shall be provided. In double shutter door, the first closing shutter shall have concealed aluminium alloy powder coated /Color anodized tower bolt at top and bottom.

M-32 Rolling Shutters :

32.1 The rolling shutters shall conform to IS: 6248. Rolling shutters shall be supplied of specified type, with accessories. The size of the rolling shutters shall be as specified in the drawings. The shutters shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm.. thick and 80 mm. wide, for shutters upto 3.5 m. width and not less than 1.25 mm. thick and 80 mm. wide, for shutters 3.5 m. in width and above, unless otherwise specified.

32.2 Guide channels shall be of mild steel, deep channel section and roll pressed or built-up (fabricated), with jointless construction. The thickness of the sheet used shall not be less than 3.15 mm.

32.3 Hood covers shall be made of MS sheets, not less than 0.90 mm. thick. For shutters having width of 3.5 m. and above, the thickness of MS sheet for the hood cover shall be not less than 1.25 mm.

32.4 The spring shall be of best quality and shall be manufactured from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in all positions. The spring pipe shaft

etc. shall be supported on strong MS or malleable CI brackets. The brackets shall be fixed on or under the lintel as specified with hilti or Fischer

32.5 The rolling shutters shall be of self rolling upto 8 m^2. clear area, without ball bearing and upto 12 m^2. clear area, with ball bearing. If the rolling shutters are of large area, then gear operated type shutters shall be used, unless otherwise specified.

32.6 The locking arrangement shall be provided at the bottom of shutter at both ends. The shutters shall be opened from outside.

32.7 The shutters shall be completed with door suspension shafts, locking arrangements, pulling hooks, handles and other accessories.

M-34 Welded Steel Wire Fabric :

34.1 Welded steel wire fabric for general purpose shall be manufactured from cold drawn steel wire "as drawn" or galvanised steel conforming to IS : 226 with longitudinal and transverse wire securely connected at every intersection by a process of electrical resistance welding and conforming to IS : 4948. It shall be fabricated and finished in workmanlike manner and shall be free from injurious defects and shall be dust proof. The type of mesh shall be oblong or square, as directed. The mesh sizes and sizes of wire for square as well as oblong, welded steel wire fabric shall be as directed. The steel wire fabric in panels shall be in one whole piece, in each panel, as far as stock sizes permit.

M-35 Expanded Metal Sheets :

35.1 The expanded metal sheets shall be free from flaws, joints, broken strands, laminations and other harmful surface defects. Expanded metal steel sheet shall conform to IS : 412 except that blank sheets need not be with guaranteed mechanical properties. The size of the diamond mesh of expanded metal and dimensions of strands (width and thickness) shall be as specified. The tolerance on nominal weight of expanded metal sheets shall be of $\pm$ 10%.

35.2 Expanded metal in panels shall be in one whole piece, in each panel, as far as stock sizes permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

M-36 Mild Steel Wire (Wire Gauze Jali) :

36.1 Mild steel wire may be galvanised, as indicated. All finished steel wire shall be well sawn to the dimensions, and the size of the wire shall be as specified in item. The wire shall be sound, free from splits, surface flaw, rough, jagged and imperfect edges and other harmful surface defects and shall conform to IS : 280.

M-37C Prelaminated - Standard and Veneered :

37C.1 **Decorative Plywood :**

37C.1.1 It shall be obtained from manufacturer as approved by the Engineer-in-charge. It shall conform to relevant IS Code.

37C.1.2 Plywood shall be made from hard wood timbers, finished with selected species of timber, suitable for veneers and bonded with strictly controlled and evenly spread adhesives. It shall be smooth and strong and shall be free from warping, cupping and twisting.

37C.2 **Decorative Veneers :**

37C.2.1 Decorative veneered plywood shall be manufactured using veneers of the best quality timbers like Teak, Rosewood, Walnut, Laurel, White Cedar and many others.

37C.2.2 They shall be available in flitch form as well as in lay-on form, in sizes suitable to the furniture industry. They shall be available either flat or quarter sliced, varying in thickness from 0.2 mm. to 1.5 mm. Lengths shall vary upto 4 m.

M-37D Block Boards :

37D.1 They shall be manufactured from well-selected and seasoned hardwood timbers, used in sturdy construction. They shall be usually bonded with Urea Formaldehyde, however against specific requirements to make the termite /porer proof, **Phenol Formaldehyde bonded boards shall be used.**

37D.2 They shall be strong, weather and water proof and shall be ideally used for high quality furniture and exterior applications.

M-38 Glass :

38.1 All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes, blisters, and other defects. The kind of glass to be used shall be as mentioned in the item or specification or in the special provisions or as shown in detailed drawings. Thickness of the glass panels shall be uniform. The specifications for different kinds of glass shall be as under:

38.2 **Sheet Glass :**

38.2.1 In absence of any specified thickness or weight in the item or detailed specifications of the item of work, sheet glass shall be weighing 7.5 Kg/m^2. for panes upto 600 mm. x 600 mm.

38.2.2 For panes larger than 600 mm. x 600 mm and upto 800 mm. x 800 mm., the glass weighing not less than 8.75 Kg/m^2. shall be used. For bigger panes upto 900 mm. x 900 mm., glass weighing not less than 11.25 Kg/m^2. shall be used.

38.2.3 Sheet glass shall be patent flattened glass of best quality and for glazing and framing purposes shall conform to IS : 1761. Sheet glass of the specified colours shall be used, if so shown on the detailed drawings or so specified for important buildings and for panes with any dimensions over 900 mm., plate glass of specified thickness shall be used.

38.3 **Plate Glass :**

38.3.1 When plate glass is specified, it shall be `Polished patent plate glass' of best quality. It shall have both the surface ground flat and parallel and polished to obtain clear undisturbed vision and reflection. The plate glass shall be of thickness mentioned in the item or as shown in the detailed drawing or as specified. In absence of any specified thickness, the thickness of plate glass to be supplied shall be 6 mm. and a tolerance of 0.20 mm. shall be admissible.

38.4 **Obscured Glass :**

38.4.1 This type of glass transmits light so that vision is partially or almost completely obscured. Glass shall be plain rolled, figure, ribbed or fluted, or frosted, as may be specified or as required. The thickness and type of glass shall be as per details on drawings or as specified or as directed.

38.5 **Wired Glass :**

38.5.1 Glass shall be with wire netting embedded in a sheet of plate glass. Electrically welded 13 mm. Georgian square mesh shall be used. Thickness of glass shall not be less than 6 mm. Wired glass shall be of the type and thickness as specified.

38.6 **Double Glazed units :**

38.6.1 Double glazed unit shall comprise of two glasses, of appropriate thickness and absolutely machine-cleaned on both sides, with an air gap of 12 mm .in-between. The space between the two glasses is kept totally dry, avoiding any condensation by sealing the space with elastomeric sealant. Thus in all, it is an insulating glass unit of around 20mm. thickness.

38.6.2 It shall be suitably used for any kind of Doors and Windows, in all areas of work and residences. It shall be absolutely and clearly transparent, giving the following advantages :

1) Total light penetration, but with dust and heat insulation.
2) Noise insulation.
3) 25% saving in electricity due to heat insulation.
4) Crystal clear transparency.

M-43 Fixtures and Fastenings :

43.1 **General :**

43.1.1 The fixtures and fastenings, that is butt, hinges, tee and strap hinges, sliding door bolts, tower bolts, door latch, bath-room latch, handles, door stoppers, casement window fasteners, casement stays and ventilators catch shall be made of the metal, as specified in the item or its specification.

43.1.2 They shall be of iron, brass, aluminium, chromium plated iron, chromium plated brass, copper oxidised iron, copper oxidised brass or anodised Aluminium, as specified.

43.1.3 The fixtures shall be heavy types. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operations.

43.1.4 The samples of fixtures and fastenings shall be got approved by Engineer-in-charge, as regards its quality and shape before fixing them in position.

43.1.5 Brass and anodised aluminium fixtures and fastenings shall be bright finished.

43.2 **Holdfasts :**

43.2.1 Holdfasts shall be made from mild steel flat 30 cm. length and one of the holdfasts shall be bent at right angle and two nos. of 6 mm. diameter holes, shall be made in it for fixing it to the frame with screws. At the other end, the holdfast shall be forked and bent at right angles in opposite directions.

43.3 **Butt hinges :**

43.3.1 Railway standard heavy type butt hinges shall be used when so specified.

43.3.2 Tee and strap hinges shall be manufactured from MS Sheet.

43.4 **Siding door bolts (Aldrops) :**

43.4.1 The aldrops as specified in the item shall be used and shall be got approved.

43.5 **Tower bolts (Barrel type) :**

43.5.1 Tower bolts as specified in the item shall be used and shall be got approved.

43.6 **Door Latch :**

43.6.1 The size of door latch shall be taken as the length of latch.

43.7 **Bathroom Latch :**

43.7.1 Bathroom latch shall be similar to tower bolt.

43.8 **Handle :**

43.8.1 The size of the handles shall be determined by the inside grip length of the handles. Handles shall have a base plate of length 50 mm. more than the size of the handle.

43.9 **Door Stoppers :**

43.9.1 Door stoppers shall be either floor door stopper type or door catch types. Floor stopper shall be of overall size as specified and shall have a rubber cushion.

43.10 **Door Catch :**

43.10.1 Door catch shall be fixed at a height of about 900 mm. from the floor level such that one part of the catch is fitted on the inside of the shutter and the other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixing. The catch shall be fixed 20 mm. inside the face for the door for easy operation of catch.

43.11 **Wooden Door Stop with Hinges :**

43.11.1 Wooden door stop of size 100 mm. x 60 mm. x 40 mm. shall be fixed on the door frame with a hinge of 75 mm. size and at a height of 900 mm. from the floor level. The wooden door stop shall be provided with 3 coats of oil paint.

43.12 **Casement Window Fastener :**

43.12.1 Casement window fastener for single leaf window shutter shall be left or right handed as directed.

43.13 **Casement Stays (Straight Peg Stay) :**

43.13.1 The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially, as required. Size of the stay shall be 250 mm. to 300 mm., as directed.

43.14 **Ventilator Catch :**

43.14.1 The pattern and shape of the catch shall be as approved.

43.15 **Pivot :**

43.15.1 The base and socket plate shall be made from minimum 3 mm. thick plate, and projected pivot shall not be less than 12 mm. in diameter and 12 mm. in length and shall be firmly riveted to the base plate, in case of iron pivot and in single piece base plate, in the case of brass pivot.

M-44 Paints:

M-44A Oil Paints:

44A.1 Oil paints shall be of the specified colour and shade and as approved. The ready mixed paints shall only be used. However, if ready mixed paint of specified shade or tint is not available white ready mixed paint with approved stainer shall be allowed. In such a case, the Contractor shall ensure that the shade of the paint so allowed shall be uniform.

44A.2 All the paints shall meet with the following general requirements:

(i) Paint shall not show excessive setting in a freshly opened full can and shall easily be redispersed with a paddle to a smooth homogeneous state. The paint shall show no curdling, levering, caking or colour separation and shall be free from lumps and skins.

(ii) The paint as received shall brush easily, possess good levelling properties and show no running or sagging tendencies.

(iii) The paint shall not skin within 48 hours in a three quarters filled closed container.

(iv) The paint shall dry to a smooth uniform finish free from roughness grit, unevenness and other imperfections.

44A.3 Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures, whatsoever.

M-44B Enamel Paints :

44B.1 The enamel paint shall satisfy all general requirements in specification of oil paints. Enamel paint shall conform to IS : 2933. It shall be from Nerolac, Berger, Asian Paints or equivalent. It shall offer variety of finishes like Glossy, Semi-glossy, Pearl lustre and Matt.

44B.2 It shall be applied either by brush, roll or spray. It shall have a covering capacity of 13 to 18 m^2. per coat, depending on the surface to be painted. It shall be used both on metal and wood surfaces.

44B.3 It shall have a viscosity of application of 60 to 65 seconds, if brush or rollers are used and 30 to 40 seconds, if spraying is done. It shall have flash point at above 30 ^{0} C. The drying time shall however vary with the ambient temperature and humidity.

M-44F Acrylic Emulsion :

44F.1 It shall be from Nerolac, Asian Paints, ICI, Berger, Dulux or equivalent, as approved by the Engineer-in-charge. It shall conform to the relevant IS Codes.

44F.2 It shall be used on both interiors and exteriors, on all different types of plaster, wooden surfaces, stone, brickwork, asbestos cement sheets, hard and soft boards, etc. It shall render rich smooth finish and shall provide a tough film that forms a suitable protection against all elements.

44F.3 It shall be water thinnable. It shall require no primer. On a well prepared surface, it shall be applied, after one coat of cement primer, in case it is an interior surface and waterproof cement coating, in case it is an exterior surface. On a new but highly absorbent surface, a thin coat of the same shall be applied by adding two parts of water by volume to two parts of Acrylic Emulsion by volume. On previously painted surfaces, one coat of the same shall be applied by thinning four parts of the emulsion with one or two parts of water. It shall be applied by brush, roller or spray. It shall have a covering capacity of 25-30 m^2/lit., depending on the surface and shade used. It can be washed to remove the day-to-day dirt, after the surface has been painted, minimum for a month.

M-50 Dholpur Stone :

50.1 Dholpur sand stone shall be of best quality, as approved by the Engineer-in-charge. The stone slab shall be without any veins, cracks and flaws. The stone slab shall be even, sound and durable, regular in shape and of uniform colour.

50.2 The size of the slab shall be as specified in the item or detailed drawing or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work, with the permissible tolerance of $\pm$ 2 mm.

50.3 The stones shall have machine polished surface. When brought on site, the stone shall be rough, single polished or double polished, depending upon its use and as specified in the item or detailed drawing. The stones for paving shall generally be single polished. The stones to be used for sills, steps, brackets, coping, facias, bands, pillars, fabricated railings, jali work etc., where machine polishing after the stones are fixed in situ, is not possible, shall be double polished or polished more than once, as required.

50.4 All angles and edges of the stone slab shall be fine chiselled or polished, as specified in the item of work and all the four edges shall be machine cut. All angles and edges of the face of the stone slab shall be true and plane.

50.5 The sample of stone shall be got approved by the Engineer-in-charge, for a particular work. It shall be ensured that the stones to be used in a particular work shall not differ much in shade or tint, from the approved sample. No white, black or any other colour spots shall be there. Cheetah or tiger skinned stones shall not be allowed under any case.

B - Plumbing Works

M-P1 GI Pipes and Fittings:

The pipes shall be galvanized mild steel threaded pipes conforming to the requirement of IS: 1239 Part-I for heavy grade up to 150mm dia and IS: 3589 for pipes above 150mm dia. They shall be of the dia (nominal bore) specified in the description of the item. Galvanizing shall confirm to IS: 4736.

The pipes shall be clearly finished, well galvanized in and out and free from cracks, surface flow, laminations and other defects. All screw threads shall be clean and well cut. The ends shall be cut cleanly and square with axis of the tube.

All screw tubes shall have pipe threads conforming to the requirements of IS: 544-1955 (or revised).

All fittings shall be conforming to IS: 1239 Part II (or as revised). All fittings shall have manufacturer's trade mark stamped on it. Fittings in G.I. pipe lines shall include elbows, tees, bends, reducers, nipples, union, G.I. Clamps/Steel structural supports of approved design, nuts, bolts, washers, etc. All fittings shall be tested at manufacturer's works. Contractors may be required to produce certificate to this effect from the manufacturers.

The fittings shall have screw threads at the ends conforming to the requirements of IS: 544-1955 (or revised). Female threads on fittings shall be parallel and male threads (except on running nipples and collars of unions) shall be tapered.

M-P14 Brackets/ Clamps:

All vertical pipes shall be fixed by M.S. Clamps truly vertical. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard).

Inclined pipes running along ceiling shall be fixed on M.S. adjustable hangers of special design shown on the drawings or as directed. Pipes shall be laid to uniform slope and the hangers adjusted to the proper levels so that the pipes fully rest on them.

M.S. clamps shall be of standard design and fabricated from M.S. flat as mentioned in drawings or as directed by the engineer in charge of works they shall be painted with two coats of approved paint over the base coat of anticorrosive paint before fixing.

Structural clamps shall be fabricated from M.S. structural members e.g. rods, angles, channels, flats, as per detailed drawing or as directed. Contractor shall provide all nuts, bolts, welding and paint the clamps with one coat of red oxide. Wooden saddles shall be provided free of cost.

Slotted angle/channel supports on walls shall be provided wherever shown on drawings or as required. Angles/channels shall be fixed to brick walls and bolts embedded in cement concrete blocks and to RCC walls with suitable anchor fasteners. Holes required in RCC walls shall be neatly drilled by electric drills and no manual chiseling will be allowed. The spacing of supports horizontally shall not exceed 1.8 M.

Wherever M.S. clamps are required to be anchored directly to brick walls, concrete slabs, beams or columns, nothing extra shall be payable for clamping arrangement and for making good with cement concrete 1:2:4 (mix 1 cement :2 coarse sand :4 stone aggregate 20mm nominal size) as directed by the Client's Representative.

M-P15 Unions:

Contractor shall provide adequate number of unions on all pipes to enable dismantling later. Unions shall be provided near each gun metal valve, stop-cocks or check-valves and on straight runs, as necessary, at appropriate locations.

M-P16 Flanges:

Flanged connections shall be provided on pipes running through shafts as shown on the drawings and at all equipment connections. Connections shall be made by the correct number and a 3 mm thick gasket. Where hot water or steam connection are made, insertion gasket shall be suitable for high temperature grade and quality, approved by the consultant. Bolt hole dia for flanges shall conform to those of CI sluice valves.

M-P17 Gun Metal Gate/Wheel/Non-Return Valve (swing type):

ISI MARKED valves of required size shall be of heavy gun metal fullway type or Globe valves conforming to IS:778 tested at 20 kg/cm^2. Valves above 65 mm dia shall be flanged mount tested at the manufacturer's works and their name stamped on it.

SECTION - 6 - (v) Detailed Specifications - Civil Works

Item-1&2 Excavation in all sorts of the soils up to depth as mentioned below for any works i.e. foundation, over areas etc. including shoring, strutting and dewatering if required, dressing of sides, trimming and ramming bottom including refilling the excavated earth in plinth/ foundation trenches / Disposing the additional excavated earth inside campus including watering, compacting in layers not exceeding 150 mm to 200 mm thick etc. complete as directed by the Engineer-in-charge.

i. Excavation up to 1.50 Mt depth

Note: No extra payment shall be made for cleaning of mud due to rain, disposing the additional excavated earth inside Campus. The contractor will also be required to take necessary care of pipelines, cables, existing structure etc., during the course of excavation work.

&

Extra for Excavation over areas/ Foundation & Trenches in ALL KINDS OF SOIL for each additional in depth of 1.5m or Part thereof over initial depth of 1.5m as per specification and as directed by Engineer-in-charge. (Extra over item No.-1)

1.0 General :

1.1 Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. falls under this category. For materials and workmanship for earthwork and excavation, relevant specifications of IS 1200 (Part I) and IS: 3764 shall be followed.

2.0 Clearing the Site :

2.1 The site on which the structure is to be built shall be cleared and all obstructions, loose stones, materials and rubbish of all kind, bush shall be removed, as directed. The materials so obtained shall be the property of the Institute and shall be conveyed and stacked as directed, within 50-m. lead. The roots of the trees coming in the sides of the trenches shall be cut and coated with hot asphalt.

2.2 The rate of site clearance is deemed to be included in the rate of earthwork, for which no extra will be paid.

3.0 Setting out :

3.1 After cleaning the site, the centerlines will be given by the Engineer-in-charge. The Contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labours, materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0 Excavation :

4.1 The excavation in the foundation shall be carried out in true line and level and shall have the width and depth, as shown in the drawings or as directed. The Contractor shall do the necessary shoring and strutting or shall provide necessary slopes to a safe angle or steps, as required or

directed, at his own cost. No extra payment shall be made for such precautionary measures, taken. The bottom of the excavated area shall be leveled both longitudinally and transversely, as directed, by removing excess soil and watering, as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason, excavation is made deeper or wider than shown on the drawings or as directed. The extra depth or width shall be made up with concrete of the same proportion, as specified for the foundation concrete, at the cost of the Contractor. The excavation up to 1.5 m. depth shall be measured under this item.

4.2 The Contractor shall at his own expense and without extra charge make provision of supporting all utility services, lighting the trenches, separating and stacking serviceable materials neatly, shoring, timbering, strutting, bailing out water either sub-soil or rainwater, including pumping at any stage of the work. Trenches shall be kept free of water while masonry or concrete works are in progress and till the Engineer-in-charge considers it necessary, i.e. till the concrete is sufficiently set.

4.3 The rates for excavation items shall include for clearing of site, surface dressing, making layout of building, fixing permanent grid points with MS angle iron posts and embedding them in C.C. 1:2:4, placed sufficiently away from the building lines, establishing bench marks etc. complete.

5.0 Disposal of the Excavated Stuff :

5.1 The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers, including ramming and watering etc. complete.

5.2 The Contractor shall remove the balance of the excavated quantity from the site of work, to a place, as directed, within a campus and for all lift.

6.0 Mode of Measurement and Payment :

6.1 The measurement of excavation in trenches for foundation shall be made according to **the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge**. No payment shall be made for surplus excavation made in excess of above requirements or due to stepping and sloping back as found necessary, on account of conditions of soil and requirements of safety.

6.2 The rate shall include for clearing the site, surface dressing, making layout of the building, fixing permanent grid points with MS iron posts, embedded in C.C. 1:2:4, placed sufficiently away from the building and establishing bench marks etc.

6.3 The rates shall include for necessary shoring, timbering and strutting for protection of sides of the excavated trenches and pits, pumping out rain or surface water at any stage of construction so as to keep the trenches/pits dry, to the satisfaction of the Engineer-in-charge.

6.4 The rate shall include leveling and ramming the bottoms of excavations to receive concrete, etc. including trimming to slope wherever necessary etc. complete.

6.5 The rate shall be for a unit of one m^3.

Item-3 SURFACE DRESSING of the ground IN ALL KINDS OF SOIL including removing vegetation and inequalities not exceeding 15cm depth including watering, ramming of bottom,

rolling, getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 150 meter complete as per specification and as directed by the Engineer-in-charge. (Disposed soil to be levelled by breaking clods if any and neatly dressed).

1.0 Workmanship :

2.1 The relevant specification of item no. 1 shall be followed except that SURFACE DRESSING of the ground IN ALL KINDS OF SOIL including removing vegetation and inequalities not exceeding 15cm depth including watering, ramming of bottom, rolling, getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 150.

2.0 Mode of Measurements and Payment :

2.1 The relevant specification of item no. 1 shall be followed.

The rate shall be for an unit of one m^2.

Item-4 Earth filling with available earth at optimum moisture content in layers not exceeding 20cms in thickness consolidating each layer by ramming in dovetail sections using frog rammer / surface vibrator, watering and finishing to required slope with all lifts and lead etc. completed as per specification and as directed by the Engineer-in-charge. (Compacted earth shall be measured for payment. This item shall be measured and paid only if contractor is instructed to carry out the mechanical compaction. Normal back filling has been included under item No. 1, 2 and 3 only. Compaction done at office corridor shall only be paid under this item.)

1.0 Workmanship :

1.1. The earth to be used for filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken to a size not bigger than 50 mm.

1.2. As soon as the work in foundation has been completed and measured, the sides of foundation shall be cleared of all debris, brick bats, mortar dropping etc. and filled with earth in layers not exceeding 15 cm. Each layer shall be adequately watered, rammed well and consolidated before the succeeding layer is laid. The earth shall be rammed with mechanical rammer of different capacity as per site condition.

1.3. The **plinth & plot** shall be similarly filled with earth in layers not exceeding 15 cm adequately watered and consolidated by ramming with iron rammers **& mechanical compactor**. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

1.4. The finished level of filling shall be kept to shape and gradient, intended to receive any floor finish.

1.5. In case of large heavy duty flooring like factory flooring, the consolidation may be done by **vibratory / static rollers**, where so specified or as directed. The extent of consolidation required shall also be as specified or as directed.

1.6. The good quality selected type only earth shall be allowed to be used for filling the **plinths.** Under no circumstances, black cotton soil shall be used for filling the plinths.

2.0 **Mode of Measurements and Payment :**

2.1. The payment shall be made for filling in **plinth.** No deductions shall be made for shrinkage or voids, if considered as instructed above. Only consolidated measurements shall be paid.

2.2. The rate includes cost of collecting and carting available earth of approved quality with all lead, lift and labour required for filling in foundations and plinth.

2.3. The rate shall includes the cost of mechanical compaction by compactors.

2.4. The rate shall be for an unit of one m^3.

Item-5 Supplying and filling in plinth with RIVER SAND in layers not exceeding 15cms in depth consolidating each deposited layer by ramming thoroughly, watering and dressing etc. for all leads and lifts etc. complete as per specification and as per specification and as directed by the Engineer-in-charge.

3.0 Materials: Sand shall conform to M-6.

4.0 Workmanship :

2.1 The relevant specification of item no. 3 shall be followed except that sand shall be filled in foundations and in plinth, under floors, including watering, ramming well, consolidating and dressing etc., complete.

5.0 Mode of Measurements and Payment :

5.1 The relevant specification of item no. 4 shall be followed.

5.2 The rate includes cost of collecting, carting good quality sand, with all lead, lift and labour for filling the same in foundations and in plinth, mechanical compaction.

The rate shall be for an unit of one m^3.

Item-6 Disposal of excavated earth and / or debris up to a lead as mentioned below by mechanical transport including loading, unloading and stacking etc., complete all as per specifications. The disposable items are to be dumped on places as directed by the Engineer-in-charge and as per local regulations. – 5 Km lead (This item shall be measured and paind only if contractor is instructed to dispose surplus excavated earth outside campus. Disposing of earth inside campus has been included under item No 1, 2 and 3 only).

1.0 Workmanship :

1.1 The surplus excavated earth shall be disposed off as and when directed by the Engineer-in-charge, outside campus – up to 5 Km lead. The site to which the excavated earth should be disposed off shall be **as per local regulations**. The disposal of the stuff includes loading the earth in vehicle, conveyance to the specified site, unloading and spreading the same. The Contractor should contact the Engineer-in-charge before disposing the material, i.e. when the trucks are being loaded for disposal. Every time the truck is loaded, the Engineer-in-charge shall check whether it is loaded properly to the pre-decided level and then note its number in the register used to keep the record of the trips made by the same truck.

2.0 Mode of Measurements and Payment :

2.1 The work shall be measured as 75% of the quantity, in m^3, loaded in a single truck. The total no. of trucks shall be taken from the register and the quantity shall thus be calculated for **adhoc certification.** The total measurement shall be in m^3.

2.2 The rate includes for spreading, dressing etc. complete, outside campus / at the specified site and shall be for an unit of one m^3.

2.3 The final measurements (QTY) shall be calculated from reconciliation.

Item-7 & 8 Providing and laying Bricks masonry works using common burnt clay conventional building bricks confirming to IS 1077-1986 of having crushing strength not less than 35 Kg/cm2. in foundation and plinth, in CM 1:6 (1 cement :6 find sand), in any shape & all depth, including curing, scaffolding, racking / flush jointing, roughing of the existing surface, making of "Key" removing of plaster etc. complete as per specification and as directed by Engineer-in-charge

& Providing and laying Bricks masonry works using common burnt clay conventional building bricks confirming to IS 1077-1986 of having crushing strength not less than 35 Kg/cm2. in super tructure up to height of 5.00 Mt from plinth, in CM 1:6 (1 cement :6 find sand), in any shape & all depth, including curing, scaffolding, racking / flush jointing, roughing of the existing surface, making of "Key" removing of plaster etc. complete as per specification and as directed by Engineer-in-charge.

1.0 Materials : Water shall conform to M-1. Cement to M-3. Sand to M-6. Brick to M-15. Cement mortar to M-11.

2.0 Workmanship :

2.1 **Proportion :** The proportion of the CM shall be 1:6 (1 cement : 6 fine sand), by volume.

2.2 **Soaking of bricks :** The bricks required for masonry shall be thoroughly wetted with clean water for about 4 hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water is an indication of thorough wetting of bricks.

2.3 **Laying :**

2.3.1 Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete the bond; closer and in such case it shall be cut to required size and used near the ends of walls.

2.3.2 A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with the handle of the trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of the course, the vertical joints shall be fully filled from the top, with mortar.

2.3.3 The walls shall be taken up truly in plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in alternate courses shall generally be in one vertical plane. The thickness of brick course shall be kept uniform.

2.3.4 The bricks shall be laid with the frog facing upwards. A set of tools comprising of wooden straight edges, manson's spirit level, square half meter rub, pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

2.3.5 Both the faces of walls, having thickness greater than 23 cm. shall be kept in proper plumb. All the connected brick work shall be kept not more than 1 m. over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45^{O}.

2.3.6 All the fixtures, pipe outlets of water, holdfasts of doors and windows, etc. which are required to be built in the wall shall be embedded in CM, as per the drawings or as directed.

2.4 **Joints :**

2.4.1 Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exceed 12 mm. The face joints shall be raked out as directed by taking tools daily, during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to be done, subsequently.

2.4.2 The face of bricks shall be cleaned everyday on which the brick work is laid and all mortar dropping shall be removed.

2.4.3 At the end of day's work or on holidays the top of unfinished masonry shall be kept wet. If the mortar becomes dry, white or powdery, for want of curing, work shall be pulled down and re-built at Contractor's expense.

2.5 **Curing :** Fresh work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for minimum period of 7 days. The top of masonry work shall be kept well wetted at the end of the day's work.

2.6 **Preparation of foundation bed :** If the foundation is to be laid directly on the excavated bed, the bed shall be levelled, cleared off of all loose materials, cleaned and wetted before starting masonry work. If masonry is to be laid on concrete footing, the top of concrete shall be roughened, cleaned and moistened. The Contractor shall obtain approval of the Engineer-in-charge for the foundation bed, before foundation masonry is started. When pucca flooring is to be provided flush with the top of the plinth, the inside of the plinth wall shall be lowered down having an offset of the same thickness of the flooring with respect to the outside plinth wall top or as directed.

3.0 Mode of Measurements and Payment :

3.1 The measurement of this item shall taken for the brick masonry fully completed in foundation upto plinth & for super structure. 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.

3.2 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 cm^2.
(2) Openings in walls, parapet and compound walls, not exceeding 1.0 m^2. 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 upto 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 cm^2. in masonry.

3.3 Apertures for fire places shall not be deducted nor shall extra labour required to make splaying of jambs, throating and making arches over the aperture be paid for separately. The rate shall include for work of any shape e.g. pillars of any size and shape, curved or tapered walls, drip courses, projections, parapets, load bearing walls, sills, ottas, steps, tank walls, platforms and counter walls, ducts, channels and mouldings like corbelling, pattas, etc.

3.4 The rate shall be for a unit of one m^3.

Item- 9 Providing and Constructing Random Rubble Masonry for retaining wall including loading, unloading, transporting and laying old stone (Stone available with Institute shall be used.) in CM 1:6 including providing and laying bond stone per every 0.50 square meter surface area of wall (Bond stone of size 230 mm x 230 mm up to full thickness of wall in RCC 1:1.5:3 with Reinforcement steel of 8 mm dia bars Four nos. & Rings of 8 mm dia at 200 mm c/c including necessary form work) necessary dressing of stone for corner and end walls, scaffolding, racking out joints for pointing, flush Joint on the unexposed surface cleaning with wire brush, providing of expansion joint at every change of level and direction and 25 mts in linear, curing , pockets for fencing posts for superstructure above plinth level uo tp 5 meters height from plinth, for compound wall, retaining wall, culverts etc., for all leads and lift etc., complete all as per specification drawing and as directed by Engineer-in-charge.

1 **Materials:** Water shall conform to M-1. Cement to M-2. Sand to M-3. Cement mortar shall conform to M-7. Stones to M-16 / Available with institute to be used.

2 **Workmanship :**

Dressing of Stones : Stone used for uncoursed rubble masonry work shall be hammer dressed on the sides, and beds in such a way as to close up with the adjacent stone in the masonry work as strongly as possible. The face stone shall be dressed in such a manner as to give a specified pattern such as diagonal touching etc. The face of the stone shall be so dressed that brushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on the face to be plastered, it shall not project by more than 19 mm. nor shall have depressions more than 10 mm. from the average wall surface.

Laying : All the stone shall be sufficiently wetted before laying to prevent absorption of water from mortar. The wall shall be built truly in plumb (or true to required batter when so specified). All connected walls in a structure shall normally be raised up uniformly and regularly. However, if for any specific reason, one part of masonry is required to be left behind, the wall shall be racked back at an angle not steeper than 45°, vertical toothed joints in masonry shall not be allowed. The work shall be carried out regularly and masonry of any day will not be raised by more than 1 m. in height, at a time.

The stone shall be laid in an uncoursed fashion or random facing etc. However, the masonry is required to be brought to level at various stages viz. plinth level, window still level, roof level and any other level specifically shown in the drawings. This may be done by adjusting the laying of stones upto the level specified or the nearest to that level and then by providing levelling coarse of

cement concrete 1:6:12 (1 cement : 6 sand : 12 graded stone aggregate 20 mm. nominal size) to bring the masonry work upto the desired level or as otherwise specified.

Proper bonding shall be achieved by closely filling in adjacent stones as well as by using bond stones or through stones as described herein below. Face stones shall extend back sufficiently and bond well with the masonry. The stone shall be carefully set so as to break joints and avoid formation of vertical joints. The depth of stone from the face of wall inward shall not be less than height or breadth at the face. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape. Neither the face stone nor the hearting stone shall be so small to pass through circular ring of 150 mm. internal diameter in any direction nor shall any of them shall have minimum thickness 100 mm.

All stone shall be carefully laid, hammered down by a wooden mallet into position and solidly embedded in mortar. Chips of stone may be used wherever necessary to avoid thick mortar beds or joints. At the same time no hollow space shall be left anywhere in the masonry. The chips used shall not be more than 20% by volume of masonry. The hearting stone shall be laid nearly in level with face stones except at vertical bond stone laid at 1 m. intervals or plumbs projecting about 150 to 200 mm. shall be firmly embedded to form vertical bonding in masonry.

Bond Stones : There shall be atleast one bond stone for every 0.5 m^2 of walls surface. The bond stone shall be marked by a distinguishing letter during construction for subsequent verification and shall be laid staggered in subsequent layers. The bond stone should be of RCC 1:2:4 of size 230 mm x 230 mm up to full thickness of wall with Reinforcement of 8 mm dia 4 Nos. & Rings 8 mm dia at 200 mm c/c. The rate also included for shuttering work for bond stone etc.

Quoins : The quoins or corner stone shall be selected stone neatly dressed with hammer and/or chisel to form the required corner angle and laid header and stretcher alternatively. The bed and top surface of quoins shall be chiselled, dressed to give horizontal joints. The quoins shall have a uniform chisel draft of at least 25 mm. width at four edges of each exposed face, all the edges of the same face being in one plane. No quoin stones shall be smaller than 0.025 $m^{3.}$ in volume.

Jamb Stones : The jamb stone shall be made with stone specified for quoins, except that the stone provided on the jambs shall have their length equal to thickness of wall upto 600 mm. and a line of headers shall be provided for walls thicker than 600 mm. as specified for bond.

Joints : All the joints shall be completely filled with mortar and their width shall not exceed 25 mm. When plastering or pointing is not required to be done, the joints shall be struck and finished simultaneously while laying the stone. Otherwise the joints shall be racked to a minimum depth of 20 mm. by a racking tools, during progress of laying while the mortar is still green.

Scaffolding : Single or double scaffolding shall be used. The scaffolding shall be strong and sound. The holes left in masonry for supporting scaffolding shall be filled and made good before plastering or pointing.

Curing : Green work shall be protected from rains by suitably covering the same. Masonry shall be kept constantly moist on all the faces atleast for a period of 7 days. The top of masonry shall be flooded at the close of the day.

3 **Mode of Measurements and Payment :**

All work shall be measured on the basis of finished dimensions and measured net except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall not be

measured and paid for. The masonry work in foundation, plinth and Super structure for all heights, levels, depths below or above the highest plinth level, for compound wall, retaining wall, culverts etc., for all leads and lift etc., shall be measured under this item. The quoted rates should also be inclusive of grouting and placing of pvc pipes for weep holes, However the cost of pvc pipe shall be paid under respective item.

No deduction shall be made nor extra payment shall be made for the following :
(a) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbels, etc. each upto 500 cm^2 in section.
(b) Opening each upto 0.1 m^2.
(c) Wall plates and bed plates bearings of chhajja and like upto 10 cm. depth (hearing of floor and roof slabs shall be deducted from masonry).
(d) Drain holes and recesses for cement concrete block to embed holdfasts for doors and windows.
(e) Building in the masonry iron fixtures pipes upto 300 mm. dia holdfasts of doors and windows.
(f) Forming cheeses in masonry upto section of 350 cm^2.

The rate shall be for an unit of one m^3.

Item-10 Providing and laying Cement Concrete 1:4:8 (1 cement : 4 coarse river sand : 8 stone aggregates using 40/20mm nominal size graded hard granite / black trap stone aggregate obtained from quarry) including compaction, finishing top surface to the level, curing, including cost of formwork etc. complete as directed by the Engineer-in-charge. In foundations, plinth, sub-base of floors etc.

1.0 Materials : Water shall conform to M-1, Cement to M-3, Sand to M-6, Stone aggregate 40 / 20 mm. nominal size to M-12.

2.0 Workmanship :

2.1 **General** : Before commencing concreting, the bed of foundation trenches shall be cleared off of all loose materials, levelled, watered and rammed, as directed.

2.2 **Proportion of mix** : The proportion of cement, sand and coarse aggregate shall be one part of cement, 4 parts of sand, 8 parts of stone aggregates and shall be so measured by volume.

2.3 **Mixing** : The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing, may however be allowed for smaller quantity of work, if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer in-charge, in case of break down of machinery and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that the mixing is continued until the mass is uniform in colour and consistency. However in such cases, 10% more cement than otherwise required, shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1.5 to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

2.4 **Transporting & placing the concrete :**

2.4.1 The concrete shall be handled from the place of mixing to the final position within 15 minutes by the method, as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

2.4.2 The concrete shall be laid in layers of 15 cm. to 20 cm.

2.5 **Compacting** : The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction and to allow all the interstices to be filled with mortar.

2.6 **Curing** : After the final set, the concrete shall be kept continuously wet, if required by ponding, for a period of not less than 7 days from the date of placement.

3.0 Mode of Measurements and Payment :

3.1 The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall also included for form work shuttering.

3.2 The rate shall be for a unit of one m^3.

Item-11 Providing and laying Cement Concrete 1:3:6 (1 cement : 3 coarse river sand : 6 stone aggregates using 20mm nominal size graded hard granite / black trap stone aggregate obtained from quarry) including compaction, finishing top surface to the level, curing, including cost of formwork etc. complete as per specification and as directed by the Engineer-in-charge. In foundations, plinth, sub-base of floors etc.

The relevant specification of item no. 10 shall be followed except proportion of cement, sand and coarse aggregate. It shall be one part of cement, 3 parts of sand, 6 parts of stone aggregates and shall be so measured by volume.

The rate shall be for a unit of one m^3.

Item-12 Providing & laying in position Reinforced Cement Concrete at all lead and level up to and below highest plinth level and for super structure up to height of 5.00 Mt in volumetric proportion 1:1.5:3 (1 cement :1.5 course sand : 3 Graded stone aggregate) for Reinforced cement concrete structural elements, of any shape and size viz. Foundation, beams, columns, pockets, slabs, slab on ground, raft, floor plinth beams, window sills, coping, vatas, lintel, walls, in any shape as per structural design using 20 mm maximum size aggregates obtained from approved quarry including, all lift and lead as specified including machine mixing, placing, compacting, vibrating, finishing the top surface to the required line level/ slope, immediate finish of concrete etc., making key with the existing wall, column etc. complete as per specification and as directed by Engineer-in-charge, including the cost of all as stated but excluding centering / shuttering and reinforcement.

1.0 Materials: Water shall conform to M-1. Cement to M-3. Sand to M-6. Grit to M-8. Graded stone aggregate 20-mm. nominal size to M-12.

2.0 General :

2.1 The concrete mix is not required to be designed by preliminary tests and only nominal mix as per IS: 456-1978 shall be followed. The proportion of the concrete mix shall be 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm. nominal size) by volume. **All Concrete work shall have smooth/ fair finished concrete surface unless otherwise specified.**

2.2 The designation ordinary M-10, M-15, M-20, M-25 specified as per I.S. corresponds approximately to 1:3:6, 1:2:4, 1:1.5:3 and 1:1:2 nominal mix of ordinary concrete, by volume respectively.

2.3 The ingredients required for ordinary concrete containing one bag of cement of 50 Kg. by weight (0.0342 m^3.) for different proportions of mix shall be as under :

Grade of Concrete	Total Qty of Dry aggregate by Volume per 5 kg of cement to be taken as the sum of individual volume of fine and Coarse aggregate, (maximum)	Proportion of fine aggregate to coarse aggregate	Qty of water per 50 kg of Cement, (Maximum)
M 10 (1:3:6)	300 liters	Generally 1:2 for FA to CA by volume but subject to upper limit of 1:1.5 and lower limit 1:3	34 liters
M 15 (1:2:4)	220 liters		32 liters
M 20 (1:1.5:3)	160 liters		30 liters
M 25 (1:1:2)	100 liters		27 liters

2.4 The water cement ratios shall not be more than those specified in the above table. The cement of the mix specified in the table shall be increased, if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction so that the water cement ratio specified in the table is not exceeded.

2.5 The workability of the concrete shall be controlled by maintaining a water-cement ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty, with the means available.

2.6 The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than 1/4th of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form.

2.7 For reinforced concrete work, coarse aggregates having a nominal size of 20 mm. are generally considered satisfactory.

2.8 For heavily reinforced concrete members as in the case of ribs of main beams, the nominal maximum size of coarse aggregate should usually be restricted to 5 mm. less than the minimum clear distance between the main bars, or 5 mm. less than the minimum cover to the reinforcement, whichever is smaller.

2.9 Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be important and the nominal maximum size may sometimes be as great as or greater than the minimum cover.

2.10 Admixture may be used in concrete only with approval of the Engineer-in-charge based upon the evidence that with the passage of time, neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.

2.11 For hot and cold weather precautions to be taken as follow:

1. Temperature of coarse aggregate should be maintained as per IS specifications by use of Ice Flakes for mass concrete.
2. Storing of coarse aggregate under shed in case of hot weather temperature.
3. Avoiding concreting in the noontime in case of hot weather and during night time in case of Cold weather.

3.0 Workmanship :

3.1 **Proportioning :** Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 Kg. weight. The volume of one such bag being taken as 0.0342 m^3. Boxes of suitable sizes shall be used for measuring sand and aggregate. The size of the boxes (internal) shall be 30 cm. x 30 cm. and 38 cm. deep. While measuring the aggregate and sand, the box shall be filled without shaking ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for bulkage shall be made.

3.3 **Mixing :**

3.2.1 For all work, concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and maintained throughout the construction. Measured quantity of aggregate, sand and cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry-mixing, measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and a half minute. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than 2 minutes after all ingredients have been put into the mixer.

3.2.2 When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on a smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platforms shall be so arranged that no foreign material gets mixed with concrete nor does the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture of uniform colour. Specified quantity of water shall then be added gradually through a rose-can and the mass turned over till a mix of required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 % above that specified.

3.2.3 Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to by the Engineer-in-charge, the first batch of concrete from the mixture shall contain only 2/3rds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement to another.

3.3 **Consistency :** The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slump tests in accordance with IS : 1199-1959. The slump of 10 mm. to 25 mm. shall be adopted when vibrators are used and 80 mm. when vibrators are not used.

3.4 **Inspection :**

3.4.1 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms, to permit him to inspect and accept the false work and forms as to their strength, alignment and general fitness but such inspection shall not relieve the Contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned. Contractor shall proper access with railing for inspection of work.

3.4.2 Centering design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited after reinforcement is laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size / PVC cover shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.4.3 All formwork shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of the Engineer-in-charge has been obtained.

3.4.4 **Formwork for Exposed concrete surface (If indicated):**

3.4.4.1 All vertical member for formwork shall be of steel like acroprops, H frame etc. Care shall be taken to set all formwork in perfect line, level (or in required camber or slope as specified) and plumb. Formwork propping shall be strong, rigid and sturdy. The formwork shall be as per pattern & design shown in drawings. Formwork shall be done accurately and precisely so as to achieve neat, clean and smooth concrete surface, in line, level and plumb. Clinks, twists, offsets, warps, riveting etc. in plates or forms shall not be allowed. Before placing concrete, forms shall be thoroughly cleaned off of all rust, dust and loose materials. Colorless oil or grease of approved quality /shuttering releasing agent shall be applied before placing steel. Also the formwork material will be of wood/plywood/steel or any sort of such material, as approved by the Engineer-in-charge, so that all exposed concrete surfaces have uniform colour. After deshuttering, all concrete surface to be properly rendered with hammery paper or stone.

3.4.4.2 For all kind of exposed concrete work only one brand (to be approved by the Engineer-in-charge) of cement shall be used.

3.5 **Transportation and laying :**

3.5.1 The method of transporting and placing concrete shall be as approved. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent material takes place.

3.5.2 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete, which has been in position for more than 30 minutes, unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer in-charge, concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 m. when internal vibrators are used and not exceeding 0.3 m. in all other cases.

3.5.3 Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 m. when trunking or chutes are used they shall be kept closed and used

in such a way so as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted and covered with a 13 mm. thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. This 13-mm. layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgment of any particles or coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150 mm. in thickness and shall be well rammed against old work, particular attention being given to corners and close spots.

3.5.4 All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise, permitted by the Engineer-in-charge for exceptional case, such as concreting under water, where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

3.5.5 Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream upto form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to dry mixture. During compaction, it shall be observed that needle vibrators are not applied on reinforcement, as it tends to destroy the bond between concrete and reinforcement.

3.6 **Curing :** Immediately after placing and compaction, concrete shall be protected from weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. After 24 hours it shall be covered with wet sacking basin or other similar absorbent material approved soon after the initial set and shall be kept **continuously wet for** a period of not less than **14 days** from the date of placement. Masonry work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

3.7 **Sampling and testing of concrete :**

3.7.1 Samples from fresh concrete shall be taken as per IS : 1199-1959 and cubes shall be made, cured and tested at 7 days or 28 days as per requirements in accordance with IS : 516-1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following :

Qty. of concrete in the work	No. of samples	Qty. of concrete in the work	No. of samples
1-5 m^3.	1	16-30 m^3.	3
6-15 m^3.	2	31-50 m^3.	4
51 and above	4 + one additional for each additional 50 Cm. or part thereof.		

NOTE : Atleast 1 sample shall be taken from each shift. Ten test specimens shall be made from each sample, 5 for testing at 7 days and the remaining 5 at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.7.2 The average strength of the group of cubes cast for each day shall not be less than the specified cube of specific grade of concrete at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportions given for a particular grade, does not yield the specified strength, such concrete shall be classified as belonging to the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

3.8 **Stripping :**

3.8.1 The Engineer-in-charge shall be informed in advance by the Contractor of his intention to strike the formwork. While fixing the time for removal of formwork, due consideration shall be given to local conditions, character of the structure, the weather and other condition that influence the setting of concrete and of the materials used in the mix. In normal circumstances (generally where temperature are above 20^{o}C) and where ordinary concrete is used, forms may be struck after expiry of periods specified in item no. 3.01 for respective item of formwork.

3.8.2 All formwork shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit and struts are removed, the concrete surface shall be gradually exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centering shall be gradually and uniformly lowered in such manner as to permit the concrete to take stress due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to re-use the formwork, it shall be cleaned and made good to the satisfaction of the Engineer in-charge. After removal of formwork and shuttering the Engineer-in-charge shall inspect the work and satisfy by random checks that concrete produced is of good quality.

3.8.3 Immediately after the removal of forms, all exposed bolts etc. passing through the cement concrete member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of atleast 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fine mortar lines caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions honeycomb spots, broken edges or corners and other defects shall be thoroughly cleaned saturated with water and carefully pointed and rendered true with mortar of cement and fine sand. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours. For repairing concrete members, bonding agent shall be used.

3.8.4 If rock pockets/honeycombs in the opinion of Engineer-in-charge are of such an extent or character so as to effect the strength of the structure, materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portion of the structure affected.

4.0 Mode of Measurements and Payment:

4.1 The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawing or as directed shall not be measured. No deduction shall be made for:

a. Ends of dissimilar materials such as joists, beams, posts, girders, rafters, purline trusses, corbels and steps etc. upto 500 cm^2. in section.

b. Openings upto 0.1 m^2.

c.No extra labour should be paid for forming such openings, voids or pockets.

4.2 The rate includes cost of all materials, labour, tools and plant required for mixing, placing in position, vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength, for all floors, at any height and level, in any position. The rate excludes the cost of formwork.

4.3 The rate shall be for a unit of one m^3.

Item-13 Providing and erecting rigid and water tight centering and shuttering form work using best quality wooden planks/plywood sheets steel centering plates including, strutting propping, bracing, staging, etc., complete as per specification and for RCC items fixed in position for all concrete elements vertical, horizontal or inclined in all shapes at any level below and above plinth including necessary Scaffolding, fastener nails, wires keeping in position till concrete is laid and keeping in position concrete members have acquired required strength, removal thereafter including providing and applying shuttering oil etc. complete as per specification and as directed by Engineer in charge for column foundations, pedestals, wall footings, beams, grade slabs, coping, cable trenches, etc. at any height or level up to and below highest plinth level and for super structure for height up to 5.00 Mt etc., complete as per specification and as directed by Engineer in charge.

1.0 Materials :

1.1 The shuttering to be provided shall be of ordinary timber planks/shuttering ply /steel sheets shall conform to M-26A. M-26B & M-26C respectively

1.2 The dimensions of scantling and battens shall conform to the design. The strength of the form work shall not be less than that assumed in the design.

2.0 Workmanship :

2.1 The form work shall conform to the shape, lines and dimensions as shown on the drawings and shall be so constructed so as to remain sufficiently rigid and water-tight, during the placement and compaction of the concrete. Adequate arrangement shall be made by the Contractor to safe guard against any settlement of the form work during the course of concreting and after concreting. The formwork of shuttering, centering, scaffolding, bracing, etc. shall be as per the design. False staging should be erected with MS –adjustable props or H frames or equivalent system

2.2 **Cleaning & Treatment of Forms :** All rubbish, particularly chipping, shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treated. The surface shall be coated with mould releasing agent, applied before concreting is done. Shuttering releasing agent of approved manufacture may be applied. Care shall be taken that the coating is not applied on the construction joints surface and steel reinforcement bars.

2.3 **Stripping Time :** In normal circumstances and where ordinary portland cement is used, form work may be struck after expiry of the following periods subject to approval/confirmation from Engineer in charge:

(a) Sides of walls columns and vertical faces of beams		**24 to 48 hours.**
(b) Beam soffits (Props left under)		**7 days.**
(c) Removal of props for slabs -	**(i) Slabs spanning upto 4.5 m.**	**7 days.**
	(ii) Slabs spanning over 4.5 m.	**14 days.**
(d) Removal of props to beams and Arches -	**(i) Spanning upto 6 m.**	**14 days.**
	(ii) Spanning over 6 m.	**21 days.**

2.4 **Procedure while removing the form work :** All form work shall be removed without such shocks or vibrations as would damage the reinforced concrete surface. Before the soffit form work and struts are removed, the soffits and the concrete surface shall be exposed where necessary, in order to ascertain that the concrete has sufficiently hardened.

2.5 **Centering :**

2.5.1 The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the form work and concrete work before, during and after pouring concrete till it achieved full strength. Watch should be kept to see that behavior of centering and form work is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.5.2 The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads, without any settlement.

2.5.3 The centering and form work shall be inspected and approved by the Engineer-in-charge, before concreting. But this will not relieve the Contractor of his responsibility for strength, adequacy and safety of form work and centering. If there is a failure of form work or centering, the Contractor shall be responsible for the damages to the work, injury to life and damage to property.

2.6 **Scaffolding :**

2.6.1 All scaffolding, hoisting arrangements and ladders, etc. required for facilitating of concreting shall be provided and removed on completion work by Contractor, at his own expense. The scaffolding, hoisting arrangement, ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, Contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work and workmen, etc.

2.6.2 The scaffolding, hoisting arrangements and ladders shall allow easy approach to the work spot and afford easy inspection.

2.7 **Reuse :** Before re-use, all forms shall be inspected by the Engineer-in-charge and their suitability shall be ascertained. If, any of the forms are found to be unsuitable, they shall be immediately removed from the site. The forms ascertained for re-use, shall be scarred, cleaned, and joints gone over and repaired, wherever required. The inside surface shall be retreated to prevent adhesion to concrete.

3.0 Mode of Measurements and Payment :

3.1 Form work shall be measured as an area in m^2 of shuttering in contact with concrete except in the case of inclined members and portion of curved pro-files, in which case, only area of underside shall be measured for payment.

3.2 Form work to secondary beams shall be measured upto the sides of main beams but no deduction shall be made from the form work of the main beam at the inner section point. No deduction shall be made from the form work of a column at inner section of beams.

3.3 The rate is applicable to all conditions of working and upto any height. The rate shall include the cost of materials, its transportation at site and labour for various operations involved such as:
(a) Splayed edges, notching, allowance for overlaps and passing at angles, battens centering, shuttering, strutting, propping, bolting, nailing, wedging, easing, striking and removal.
(b) Filleting to form stop chamfered edges or splayed external angles not exceeding 20 mm. width to beams, columns and the like.
(c) Temporary opening in the forms for pouring concrete.
(d) Scarring, removal of rubbish, dressing with approved shuttering releasing agent to prevent adhesion of concrete with shuttering,
(e) Raking or circular cutting.
(f) Making necessary grooves, gissis using 10 mmX10 mm PVC battens of accucell or equivalent, cut-outs, pockets and drip moulds (grooves). if the grooves, gissis, dripmould (grove) are not provided during execution the same shall be carried out by cutting with concrete cutter & finishing smooth /rendering at no extra cost. The rate is for the completed item.

3.5 The rate shall be for a unit of one m^2.

Item-14 Supplying, fabricating and fixing in position TMT reinforcement bars Fe-500 D confirming to IS-1786 – 2008 reinforcement for RCC structures / items as per design including transporting steel to the work site, handling, decoiling, cutting, bending, cranking, fabricating to required shape, placing in position and tying / binding the system with 18 gauge (with two strands) wires, welding if necessary etc. for all floors / all levels / all heights complete as per specifications and as directions by the Engineer-in-charge. Measurement will be made on the length basis and converted into weight by using standard co-efficient (rolling margin's and wastage shall not be paid). The quoted rate should be inclusive the cost of Binding wire and the same will not be measured and paid separately.

1.0 Materials : Mild steel bars shall conform to M-19B. Mild steel binding wires to M-21.

2.0 Workmanship :

2.1 The work shall consist of furnishing and placing reinforcement to the shape and dimensions, as shown on the drawings or as directed.

2.2 Steel shall be clean and free from rust and loose mill scale, at the time of fixing in position and subsequent concreting.

2.3 Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed using a proper bar bender, operated by hand or power to attain proper radius of bends. Bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transportation or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified, a U type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than twice the diameter of the round bar and the length of straight part of the bar beyond the end of the curve shall be atleast 4 times the diameter of the round bar. In case of bars which are not round and incase of deformed bars, the diameter shall be taken as the diameter of circle having an

equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete.

2.4 All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size and by using stay blocks or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of concrete, except where shown on drawing. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not allowed. Pieces of broken stone or brick and wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, Precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawing. All the bars projecting from concrete and to which other bars are to be spliced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coat of neat cement grout.

2.5 Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm., in such manner than they do not slip over each other at the time of fixing and concreting.

2.6 As far as possible, bars of full length shall be used. In case this is not possible, overlapping of bars shall be done as directed. Where directed, where practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 1.25 times the maximum size of the coarse aggregate, whichever is greater by concrete between them. Where not feasible, overlapping bars shall be bound with annealed wires not less than 1 mm. thick, twisted tight. The overlaps shall be staggered for different bars and located at points along the span where neither shear nor bending movement is maximum.

2.7 Whenever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross sectional the base of threads is not less than normal cross section of the bar. Threads shall be standard threads. Steel coupling shall conform to IS : 226.

2.8 When permitted or specified on the drawings, joints of reinforcement bars shall be butt-welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subject to more than 75 % of the maximum permissible stresses and welds so staggered that any one section not more than 20 % of the rods are welded. Only electric are welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in 2 or 3 stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S electrodes used for welding shall conform to IS : 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3.0 Mode of Measurements and Payment :

3.1 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to in place of lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tones on the same basis of as per M-18. Length shall include hooks at the ends. The wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be needed to be included in the rate for reinforcement.

3.2 The rate for reinforcement includes cost of mild steel binding wires and its carting. Cutting, bending, placing, binding and fixing in position as shown on the drawings and as directed. It shall also include all devices like chairs, pins etc. for keeping reinforcement in approved position, cost of joining as per approved method and all wastage, covers and spacer bars.

3.3 The rate shall be for a unit of one Kg.

3.4 The contractor should quote the rates as per the specified format in BOQ.

Item-15 Supplying, fabricating, assembling, hoisting /erecting and fixing in position at all heights and with all leads Structural Steel works for Plates for all structural members and as per the detailed specifications including straightening, cutting of components in required size and shapes and profiles, smooth machining of edges/faces, welding (electric arc welding), hoisting, drilling, fixing in position, bolting wherever necessary, grouting in the RCC members including painting all the sections with one coat of zinc chromate primer and applying two coat of enamel paint "Asian / Berger/ Nerolac / ICI /Dulux" including preparing the surface etc., complete at any heights/levels all as per instructions, specifications and as directed by Engineer – in – Charge (only standard measurements will be paid)

Note :

⇒ **The fabrication work shall be confirm IS standard**

⇒ **The quoted rates should be inclusive of the all materials, labours, one coat of primer, two coats of enamel paint/aluminum paint, welding rods for all structural sections, bolts, washers, etc.**

Payment shall be made only for actual material fixed at site as per standard measurement (weights) only. Rolling margin and wastage shall not be paid.

1.0 GENERAL

1.1 Contractor to provide:

The Contractor shall provide all materials and equipments required to complete the works in every respect, whether such materials are required as part of the permanent structures or temporarily for fabrication or erection or maintenance including specifically structural steel plates, flats, bars, welding rods, rivets, bolts and nuts, paint, welding sets in the shop and at site, all workshop facilities, derricks, cranes, pulley blocks, wire ropes, hemp or Manila ropes, winches, eretion cleats and temporary braces or supports and all other materials required to deliver the works complete in every respect.

All labour required for fabrication and erection, for any cleaning, making good, rectifying, hauling, painting and for any other ancillary work required to complete fabrication and erection.

1.2 All taxes imposed by local, Municipal, State Customs, Central Government or other authorities on the fabricated, or erected material for the works, or on transport of the material or materials or equipment required temporarily for the works shall be borne by the Contractor and shall be held to be included in the Contract Rates.

1.3 The Contractor shall make his own arrangements to obtain permission to transport fabricated material from the concerned Regional Transport Officer and delay on this account shall not be considered as justifying an extension of the time stipulated for completion of the works.

1.4 The Contractor shall observe all safety requirements for erection of structural steel work as covered in IS:7205.

2.0 DRAWINGS

2.1 The Engineer will supply to the Contractor profile drawings showing sizes of all structural members and typical connection details.

2.2 Should there be any discrepancy in the drawings; the Contractor is to refer the matter to the Engineer. The Contractor shall further provide a drawing showing the accurate setting out to line and level of all the anchor bolts intended for the work in sufficient time for their inclusion in the work so as to maintain the building programme.

2.3 The Contractor is to prepare all the necessary fabrication drawings and these shall be submitted to the Engineer in duplicate and be approved by him before fabrication is commenced. All such drawings shall show the dimensions of all parts, method of construction, welding and bolting. A further set of all approved fabrication drawings shall be supplied by the Contractor for use of the Engineer as required.

2.4 Approval by the Engineer of drawings or any other particulars submitted by the Contractor shall not relieve the Contractor of full responsibility for any discrepancies, errors or omissions therein. The Contractor shall at his own expense supply such additional copies of his working drawings as are required for the use of the interested parties.

2.5 Figured dimensions on drawings shall supercede measurements by scale and drawings to a smaller scale shall take precedence over those to a larger scale. Special dimensions or directions in the specification shall supercede all else. All dimensions shall be checked on site. The Contractor shall take full responsibility for these and for the dimensions of component members.

2.6 The dimensions where stated do not allow for waste, laps, joints, etc. but the Contractor shall provide at his own cost sufficient labour and materials to cover waste, laps, joints etc.

3.0 MATERIAL

3.1 Structural Steel: All structural steel shall be of tested quality and shall conform to one of the following standards. IS:226 structural steel (Standard Quality). IS:2062 structural steel (Fusion Welding Quality). IS:961 High Tensile Structural Steel ST:44-0 of IS:977-1962 Structural Steel (Ordinary).

The Contractor shall supply to the Engineer, copies of the Manufacturer's Certificate that the steel brought to the site for incorporation in the works is of a quality fully complying with specification. If required by the Engineer the Contractor shall arrange for testing of the steel samples as per IS:1608 and IS: 1599.

3.2 Welding Electrodes: Welding electrodes used for the works shall conform to IS:814 (Latest) and shall be supplied by manufacturer approved by the Engineer and shall be of the grade approved by the Engineer. All Electrodes shall be kept under dry conditions. Any electrode which has part of its flux coating broken away or is damaged shall be rejected.

3.3 Bolts and Nuts: Bolts and nuts used for the works shall unless otherwise specified be black bolts and nuts supplied by manufacturer and approved by the Engineer and shall conform to IS:1367.

3.4 For all other material required for the works, the approval of the Engineer shall be obtained by the Contractor prior to the use of the material in the works.

3.5 All structural material shall be stored properly off the ground. It shall be kept clean. The handling of the members shall be such that they are not subjected to excessive stresses and damage. Girders and beams shall be stored upright. Long members shall be supported on closely spaced skids to prevent damage from deflection.

3.6 All material shall be straight, free from laminations and distortion. If necessary, before being worked it shall be straightened and/or flattened by pressure.

4.0 WORKMANSHIP AND FABRICATION

4.1 For all the works, workmanship shall be of first class quality throughout in conformity with IS: 800 (Latest) and true to line, level and dimensions as shown in the drawings or instructed by the Engineer.

4.2 All sheared and flame-cut edges shall be free from distortion and be filed or ground or otherwise properly finished to the satisfaction of the Engineer, prior to welding. All holes in the steel work shall be drilled and/or punched and not flame-cut.

4.3 Holes for bolts shall not be more than 1.5 mm larger than the nominal diameter of the bolts for bolt diameters up to 25 mm and not more than 2.2mm larger than the nominal diameter for bolt diameter over 25 mm. All matching holes for bolts shall register with each other within a tolerance of 2mm. When holes are drilled in one operation through two or more separable parts, these parts when specified by the Engineer shall be separated after drilling and the burrs removed.

4.4 All parts assembled for bolting shall be in close contact over the whole surface and all bearing stiffeners shall bear tightly at top and bottom without being drawn or caulked. The component parts shall be so assembled that they are neither twisted not otherwise damaged and specified cambers if any, shall be provided. No drifting of holes shall be permitted except to draw the parts together. Drifting done during assembling shall not distort the metal or enlarge holes. The butting surfaces at all joints shall be so cut and milled so as to butt in close contact throughout the finished joint.

4.5 The erection clearance for cleated ends of members and for beams without web cleats, connecting steel to steel shall be as detailed in the working drawings. Where for practical reason greater clearance is necessary, suitably designed seatings shall be provided.

4.6 All welding for the works shall be carried out by first class welders and shall be in accordance with IS:816 (Latest). The Contractor shall satisfy the Engineer that the welders are competent to carry out welding of satisfactory quality.

All surfaces prior to welding shall be suitably cut, mitred or levelled according to the instruction of the Engineer. The Engineer may at his discretion order periodic tests of the welder and/or of the welds produced by them. All such tests, shall be carried out by the Contractor at his own cost.

4.7 As much work as possible shall be welded in shops. The pieces shall be manipulated to ensure down hand welding for all shop joints as far as possible. All parts to be welded shall be arranged so as to fit properly on assembly. After assembly and before the general welding is to commence the parts are to be tack welded with small fillet or butt welds as the case may be. The tack welding must be strong enough to hold the parts together but small enough to be covered by the general welding. The welding procedure shall be so arranged that the distortion and shrinkage stresses are reduced to a minimum.

The minimum throat depth of a fillet weld as deposited shall not be less than specified size. In no case shall a concave weld be deposited. The butt weld face at all places shall be deposited above the surface of the parent metal. Where a flush surface is required the surplus metal shall be ground off. After making each run of welding all slag shall be thoroughly removed.

4.8 All joints required in structure to facilitate transport or erection shall be shown on the drawings or as specified by the Engineer. Should the Contractor need to provide joints in locations other than those specified by the Engineer he shall submit his proposals and obtain the prior sanction of the Engineer for such joints. The length of structural members shall be the maximum normally available in the market. Joining of shorter length in order to make up lengths required shall not be permitted.

4.9 Each piece of steel work shall be marked distinctly before delivery indicating the position and direction in which it is to be fixed. Three copies of a complete working plan are to be supplied to the Engineer before erection commences.

4.10 All complete work must be exact to the dimensions required. Every piece of fabricated material shall be free from rust, scale and pitting, true to thickness throughout and free from lamination, twist and distortion. All projecting plates and ends of members shall be suitably stiffened and protected to avoid distortion during storage and erection.

4.11 In the case of welded fabrication, any distortion remaining in the member after welding operations are completed shall be rectified by and/or at the expense of the Contractor to the approval of the Engineer.

4.12 All members of trusses and lattice girders shall be straight throughout their length, unless shown otherwise on the drawings, and shall be accurately set to the lines shown on the drawings. Sheared edges of gussets or other members to be straightened and dressed where necessary.

4.13 Templates and jigs used throughout the work shall be all steel. In case where actual materials have been used as templates for drilling similar pieces, the Engineer shall decide whether they are fit to be used as parts of the finished structure.

4.0 PROTECTION OF STEELWORKS (IS:8629)

5.1 The steelwork, prior to delivery, shall be cleaned from scale, rust, dirt and grease etc. by means of chipping, scraping and wire brushing using skilled operators. The cleaning shall be thorough and to the entire satisfaction and approval of the Engineer. The cleaning shall proceed eacy day over the extent of surfaces which can be painted on that day.

5.2 Immediately after cleaning as described above, the surfaces which shall be thorougly dry, shall be given one coat of zinc chromate paint of approved make of thickness not less that 125 microns DFT. Site weld locations shall be left free from paint within six inches of the weld position, and contact surfaces in connections using High Strength Friction Grip Bolt shall not be painted, but these surfaces shall be cleaned and adequately covered by a masking tape or other suitable means.

Immediately after completion of erection all damaged paint shall be scraped off and made good to the approval of the Engineer. The steelwork specialist shall also down and apply one coat of primer to all site bolts, site bolt connections and site weld locations and the painting work generally shall be left in sound condition for any subsequent painting of two coats of finishing paint of thickness not less than 80 microns DFT.

5.3 All paints and primers shall be of best quality conforming to the relevant Indian Standards and shall be procured directly from the manufacturers. All paint to be used shall be stored under cover in such conditions as will preserve it from extreme temperatures and the paint shall be used and applied strictly in accordance with the manufacturer's instructions.

5.4 In addition the following specification shall apply to the shop painting of contract and inaccessible surfaces:

a) Surfaces which are to be brought permanently into close contact or made inaccessible either in the shops or upon erection shall , after cleaning, be given two coats of Red Lead priming paint. The surfaces shall be brought into contact while the paint is still wet.
b) Surface to be painted shall be thoroughly cleaned from scale, rust, dirt, grease etc.
c) Contact surfaces in connections using High Strength Friction Grip Bolts shall not be painted or oiled and shall be free from dirt, loose scale, burrs, pits and any other defects which would prevent the solid seating of the parts and would interfere with the development of friction betweenn them.
d) All enclosed surfaces of box members shall be completely sealed by oiling or by coating with an approved bitumen paint and all such members and tubes shall have their ends closed by suitable plates welded in position.

5.5 The Contractor shall take all precautions to prevent dust and dirt coming in contact with freshly painted surfaces or with surface being painted. The second coat of paint shall only be applied when the first coat has dried.

6.0 ERECTION AND SITE WORK

6.1 The contractor shall be responsible for checking the alignment and level of foundations and correctness of foundation bolt centers well in advance of starting erection work and shall be responsible for any consequences for non-compliance thereof. Discrepancies if any shall immediately be brought to the notice of the Engineer for his advice.

6.2 During the erection, the rough handling of fabricated materials such as bending, straining or pounding with sledges shall be avoided. Any damage to the structure during transportation or

erection shall be immediately rectified by the Contractor at his own cost. The straightening of bent edges of plates, angles and other sections shall be done by methods which will not cause fracture.

Following the completion of the straightening, the surface of the member shall be carefully inspected for damage and got approved by the Engineer before further use.

6.3 The Contractor shall be responsible for accurately positioning, levelling and plumbing of all steelwork and placing of every part of the structure in accordance with the approved drawings and to the approval of the Engineer. All stanchion based beam and girder bearings etc. shall be securely supported on suitable steel racks. All reference and Datum points shall be fixed near the work site for facilitating the erection work.

6.4 All equipment by the Contractor shall be sufficient for the purpose and for the erection of the steelwork as specified in the contract. Any lifting or erecting machinery shall be to the approval of the Engineer and not dangerous or unsuitable for their functions. The approval of the Engineer shall not relieve the Contractor of his responsibilities regarding the loads to which the erection equipment shall be called upon to carry.

Adequate arrangement shall be made to resist wind loads and lateral forces arising at the time of erection.

6.5 The Contractor is entirely responsible for the stability of the structure during erection and shall arrange that sufficient tack bolts, braces or guy ropes are used to ensure that work will remain rigid until final bolting, riveting or welding is completed. The Contractor shall supply and fix, without extra charge, any temporary bracing which may be necessary.

6.6 All steelwork shall be erected in the exact position as shown on the drawings. All vertical members shall be truly in plumb, fabrication being such that all parts can be accurately assembled and erected. No permanent bolting, welding or grouting shall be done until proper alignment has been obtained.

6.7 At stanchion splices and at other positions where concrete cover to the steel is liable to be restricted, bolts will be placed with their heads on the outside of the member.

6.8 All field assembly bolting and welding shall be executed in accordance with the requirements for shop fabrication excepting such as manifestly apply to shop conditions only. Where steel has been delivered painted, then paint shall be removed before field welding for a distance of at least 50 mm on either side of the joints. The number of washers on permanent bolts shall not be more than two for the nut and one for the bolt head.

7.0 RECTIFICATION OF DAMAGED MATERIALS

Any error in shop work which prevents the proper assembly and lifting up of the parts by moderate use of drift pins or reaming or cutting shall be immediately reported to the Engineer and his approval of the method of rectification obtained in writing. Wrongly fabricated material whose erection in the field necessitates extra work shall be the responsibility of the Contractor. The entire costs of such operations including the replacement of defective members if required shall be borne by the Contractor.

8.0 INSPECTION

8.1 The Contractor shall inform the Engineer of the progress in fabrication and as to when individual pieces are ready for inspection. All gauge templates necessary to satisfy the Engineer shall be supplied by the Contractor. The Engineer may at his discretion check the results obtained at the Contractor's works by independent tests and should the material so tested be found unsatisfactory, the cost of such tests shall be borne by the Contractor.

8.2 The weld metal as deposited shall be free from cracks, slag, inclusions, porosity and cavities. The weld metal shall be properly fused with the parent metal without undercutting or overlapping at toes of weld. The surface of weld shall have a uniform and consistent contour and regular appearance.

9.0 GROUTING OF STEEL BASES

9.1 Before grouting of stanchion bases, the Contractor shall take the following action:

1) Inform the Engineer.
2) Clean all holes, openings, recesses and the top of foundations of all dirt, mud, water, oil or other extraneous matter.
3) A frame shall be placed in position around the base plate with a provision for placing or injecting grout.
4) The Contractor shall provide screed bars or mild steel flats and fix them in mortar.
5) Holes shall be provided on the stanchion bases for escape of air.

9.2 Grouting of steel beams, steel stanchions, bases and bearings and encasement of steelwork will be carried out by the Contractor after the steelwork has been finally aligned and levelled and approval of the Engineer obtained.

9.3 The bolt sleeves shall be grouted as a separate operation using neat cement grout of a creamy consistency, which shall be poured in so as to completely fill the holes. "Non Shrink" cements, additives of approved makes shall be used for all grouting operations.

9.4 The space between the top of the foundations and the underside of the base plate shall be completely filled with a mix 1:2 cement sand mortar and finished flush with edge of the base plate, either:

i. Mixed as a stiff mortar well rammed into place from all sides.
ii. Mixed as thickly as possible consistent with fluidity and tamped until the space has been properly filled.

10.0 HOLDING DOWN AND ANCHOR BOLTS

10.1 The holding down and anchor bolts should conform to the requirements laid down in IS:5624 or as directed by the Engineer.

10.2 Installation: Individual bolts in groups of holding down bolts shall be positioned accurately within a tolerance of +3 mm relative to the template center lines. The top of all bolt shanks shall be set at the required level with a tolerance of +6 mm. The bolt shall be set vertically to a tolerance of not more than one in 250.

10.3 During the casting of concrete the Contractor shall ensure that space between the bolt and sleeve is kept clean after removal of shuttering. The Contractor shall provide and fix timber plugs to

maintain this space in a clean condition. The projecting threads of bolts shall be protected by approved wrapping material.

10.4 Grouting of bolt tubes shall be carried out after the steel work or equipment have been aligned, plumbed and levelled.

11.0 ERECTION TOLERANCES

11.1 All tolerances shall be in accordance with IS:7215 unless otherwise specified.

11.2 The maximum deviation for line and level shall be + 3mm for any part of the structure including for location of column centers.

11.3 The maximum deviation for plumbing for columns shall be 3 mm in 10 m height subject to a maximum of 6 mm in a total height of 30 m.

11.4 The deviation at the center of the upper chord member from vertical plane running through the centre of the bottom chord shall not be more than 1/1500 of span but in no case more than 10 mm. The lateral displacement of top chord at center span from vertical plane running through centre of supports shall not be more than 1/250 of the depth of truss but in no case more than 20 mm.

11.5 The crane rails shall not deviate from the true location by more than + 2 mm.

12.0 MODE OF MEASUREMENT

12.1 The particular pricing must include for all rolling margins, extra for length and size, allowance for waste, complete fabrication, delivery and erection, and grouting of pockets for foundation bolts and caulking the gap between base plates and foundation.

12.2 Any temporary strutting, tying or anchor bolts, black bolts, fasteners, welding required to withstand the stresses of erection and carrying of plant are to be included in the price.

12.3 The payment for the steelwork will be for the weight of the steelwork actually erected, i.e. plates, rolled sections, shear connections, cleats, splice plates. Dimensions of the steelwork will be taken on site or from the actual shop working drawings as preferred by the Engineer. In calculating the weights of gusset plates; payment will be made for the least enclosing parallelogram or triangle. For structural sections the weight will be calculated in lengths actually used with no deduction for splay cut or mitred end, In case of imported sections, the weights chargeable shall be the weight according to the relative standards of the country of origin. Full weight of the bolts and nuts will be paid for as per Indian Standard Codes without any deduction for shanks, etc. No account shall be taken of the weight of weld in calculating the weight of steel work. Erection packing plates bedded in mortar and wedges shall not be measured but shall be included in the rates. No deduction shall be made for openings less than 0.1M2 in area measured in plane for bolt holes. The weight of sheet steel, plate, strip and rolled sections shall be taken from relevant Indian Standards.

12.4 Rate shall also included with painting all the sections with one coat of zinc chromate primer and applying two coat of enamel paint "Asian / Berger/ Nerolac / ICI /Dulux" including preparing the surface etc as per releavant specification of painting items of this section.

Item-16 .-Do- as per above item No 15 but using Angle, Flat, Channel etc.

The relevant specification of item no. 15 shall be followed but using **Angle, Flat, Channel etc**

Item-17 .-Do- as per above item No 15 but using plates including chamfering at edges etc

The relevant specification of item no. 15 shall be followed but for Plates including chamfering at edges etc.

Item-18 Providing, fabricating, assembling, hosting / erecting and fixing in position at all heights / all levels / all floors / all shapes and sizes with all leads and lifts structural steel works including Frame work for supporting and erection of the aluminum grill etc. made from "Tata, Asian, and Jindal" tubular sections as per IS 1161(round hollow sections) or box sections (square, rectangular hollow sections as per IS 4923) as per detailed drawing and design including cutting, wastage, welding, bending (shop at site), hoisting, drilling, fixing in position, bolting wherever necessary, in position welding of required lengths, griding, finishing edges, filling the welded spots with paint, grouting in the RCC members members including painting all the sections with one coat of zinc chromate primer and applying two coat of enamel paint "Asian / Berger/ Nerolac / ICI /Dulux" including preparing the surface etc., complete at any heights/levels all as per instructions, specifications and as directed by Engineer – in – Charge (only standard measurements will be paid)

Note :

⇒ **The fabrication work shall be confirm IS standard**

⇒ **The quoted rates should be inclusive of the all materials, labours, one coat of primer, two coats of enamel paint/aluminum paint, welding rods for all structural sections, bolts, washers, etc.**

Payment shall be made only for actual material fixed at site as per standard measurement (weights) only. Rolling margin and wastage shall not be paid.

The relevant specification of item no. 15 shall be followed but for **Tata, Asian, and Jindal box sections** for frame work for supporting and erection of the aluminum grill etc.

Item-19 .-Do- as per above item No 18 but for Railing modification works for hostel, guest house, student facility and married student hostel etc

The relevant specification of item no. 18 shall be followed but using **Tata, Asian, and Jindal box sections** for Railing modification works for hostel, guest house, student facility and married student hostel etc

Item-22 Providing & laying in position Tre-Mix Reinforced Cement Concrete broom finish/smooth finish pavement for plinth protection/CC Road/cricket road 75 –150 mm. thick with in volumetric proportion 1:1:2 (1 cement :1 course sand : 2 Graded stone aggregate) including giving a floating coat of 1:1 cement mortar, with nominal temperature steel, tie bar, dowel bar as per MORTH specifications of section -6 & / or steel fibres / PP fibres etc. complete.as specified by the Engineer-in-charge. The rate shall be exclusive of reinforcement steel, dowel bar and steel / PP fibres (if required). The same shall be paid in relevant tender items. Rate shall be inclusive of concrete (to be laid in alternate panels size shall be apprx 3.5mt X 5.0mt) with fair finished steel channel formwork, saw cutting of construction & contraction joints in width 3 to 5 mm x 1/4 to 1/3 thickness of pavement, filling the 25mm x 20 mm (BXD) expansion joint approximately at every 30 mt with readymix bituminous filler of Shalimar tar products or equivalent as per sample approved & directed by engineer

incharge etc complete as per specification and as directed by Engineer-in-charge, including the cost of all as stated but excluding centering / shuttering and reinforcement.

i) In vacuum dewatering concrete

NOTE

1. The RCC road concrete shall be leveled by using surface / skid vibrator.

2. The work includes removing excess water by using vacuum dewatering equipment's including spreading matt over the fresh concrete.

3. Applying power trowelling equipment to get required finish as per the direction of EIC.

4. Cost for vacuum dewatering will be paid separately by an item below. Concrete shall be laid in panels as per the direction of EIC.

&

Item-23 Extra for carrying out vaccum dewatering in floor, well compacted, mechanically vibrated, finished to reqd lvls, floated with neat cement & power trowelled to get desired finish (smooth/broom), over a levelling course, incl. MS shuttering, curing for 7 days etc complete. The reinforcement for Tremix floor to be installed as shown, the suitable size of panel should be 3.5x20.0 m or as directed by Er. The Contraction/sawed joints to be formed at every 5m distance by grooving with mechanical saw within 48 hrs. Groove sawed joints of 5 mm width & 25 mm min depth (1/3 rd depth of the pavement) as shown in the drg & operation should be carried out as soon as conc. is ready to accept the saw cut w/o trowelling etc as directed by Er-in-charge. The joints should be filled with bitumen sealant for road & PU sealant-6X6 mm for floor pavement with backer road of adequate size. The construction joint is formed by square edge & painted with bitumen. The rate shall be incl. of labour, grooves & machinery cost. The rate of conc. & steel shall be paid in relevant items separately.

The relevant specifications of item no. 12 shall be followed

Material and Workmanship:

1.1 General

The Contractor shall improve the quality of all concrete floor slabs by placing the concrete according to the Trimix system as indicated on the drawings and as specified herein.

1.2 Technical Assistance/Training of Labour

During the placement of concrete, the Contractor shall have a minimum of one person present at all times who has been adequately trained by a representative of the equipment manufacturer. This person shall be experienced in the vacuum dewatering process, and in the operation of all related equipment and shall direct all concrete dewatering work performed. The Contractor shall provide the services of a representative from the manufacturer of the vacuum dewatering equipment on site for a period of time of at least eight (8) hours. The manufacturer's representative shall proved technical assistance for the vacuum dewatering process on the initial day of operation.

1.3 Equipment for compacting, placing, vacuum processing and finishing of slab

All process equipment to be used shall be of a design representative of the state of the art, and shall be subject to the approved of the engineer. Equipment shall be Trimix or approved equal. System shall have a demonstrated five years history of performing such work. The vacuum pumps shall be able to generate a minimum vacuum of 609mm (24 inches) of mercury (0.80 atmospheres) in actual operation using the maximum number and size of suction mats required for this work.

The Contractor shall have at the job site sufficient equipment (vacuum pumps, mats, fitter pads and accessories) to ensure that the vacuum dewatering process continues uninterrupted to completion. Stand by equipment is sometimes required.

1.4 Mix Design

The Contractor is responsible for the mix designs of the class as called for on the drawings and must submit the mix proposed for use in the contract before any work is started. All mix parameters must conform to the values specified in Trimix recommendations and design mix report.

The Contractors shall utilise a knowledgeable and experienced concrete technician for the design and production of mix (mixes) meeting all the requirements of the specifications.

Do not deliver any concrete to the construction site until all the approvals have been obtained.

1.5 Quality Control

The Contractor has the responsibility for achieving the quality of concrete specified by controlling the concrete mixes, placing, vacuum process finishing and curing. The concrete technician in charge must be present at the site when work is in progress.

The Contractor shall be responsible for mix adjustments, performing necessary tests, correcting deficiencies and trouble shooting in general.

The Contractor shall be required to maintain control charts showing individual test results for aggregate gradation, slump, air content, cement content and compressive strength.

1.6 Planning of Placing

The Contractors shall submit for review shop drawings for floor slabs detailing the location of all construction joints and the sequence of the slab placement and manufacturer's literature describing the equipment to be used. In addition to the shop drawings, the Contractor shall indicate the quantity of each piece of dewatering equipment that will be located at the construction site and shall include the dimensions of all suction mats.

Before concreting is started the work should be planned with a view to determine areas to be placed daily, the required amount of equipment, size of vacuum mats, length of vacuum hoses, arrangement of rails, if any, or screeds etc. Crew required for the vacuum process is two men to handle the mats and the pump. Note that placing, vibration, vacuum treatment and floating follow immediately behind each other.

Check position of vacuum pump in relation to vacuum mat location to find whether extra vacuum hoses are required.

~~**2.1 Concrete Materials**~~

~~Note: All concrete mix design shall meet the requirements of this section and section TRIMIX concrete mix design recommendations.~~

~~**2.1.1 Cement**~~

~~Portland cement of normal grinding fineness, which corresponds to a specific surface of 2600-3500 cm2/g, is required. Cement of higher grinding fineness, e.g. rapid-hardened Portland cement of larger specific surface's shall be avoided especially in concrete mixes with a cement content 590 lb/sq.yd. Recommended content is 421 to 590 LB/sq.yd.~~

3.1 Equipment Specification Trimix System

Poker vibrator with high frequency preferably 335 hz (20 000 vibr/min) dia.1 to 1 1/2".

Surface vibrator type double beam with beam spacing 12".

Preferably one piece beam in full length exceeding bay width 8" to 24". Beam should easily be adjusted to absolute straightness and controlled every morning before placing of concrete starts.

Suction mat type RM 60. 100% tight plastic material weight 650 gram/m2. Width same as bay size and length 20' for capacity and flexibility.

Filter Pad type RD 12 weight 600 g/m2, width 4' length-bay width-minus 8".

Vacuum Pump P 4001 8 with 10 HP engine and specially designed pump unit with heavy duty chrome housing and sealing. Adjustable vacuum by valve on top of tank for ease of operation with different mix designs.

Skim floater type G 900/G 700 with disc which allows direct floating of dewatered concrete. Weight maximum 90kg (200 pounds) for 40"(W.disc.) Finishing is done with G 900, using blades only and is normally done with 30 minutes intervals between passes.

The above equipment specified should be used for the production of quality concrete floors according to the Trimix System. Inter-changeability of equipment is not recommended.

4.1 Execution Trimix System

4.1.1 General

The work shall be planned and executed so that there is no delay between the placement, screeding, dewatering and floating of the concrete. Concrete to be vacuum dewatered shall be handled and placed so as to prevent segregation. The concrete shall be internally vibrated prior to screeding.

4.1.2 Levelling

Immediately following placement, the concrete shall be levelled with a vibrating screeding running on a true surface, set at the proper elevation required to provide the specified finished

elevation. The concrete surface shall be screeded high by 2% of the slab's thickness to compensation for the compaction caused by the vacuum dewatering process. (Slabs to have an aggregate hardener shall have compensation made to maintain elevation). The vibrating screed shall be moved forward as rapidly as proper consolidation allows. The proper surcharge of concrete must be maintained in front of the leading edge of the screed.

4.1.3 Vacuum

Immediately after levelling, the concrete shall be covered with filter pads and suction mats in strict accordance with the recommendation of the manufacturer to have the slab fully dewatered. The suction mat shall extend 4 inches beyond the edge of the filter pad on all sides. The pads shall extend to within 4" of the edge of concrete slab, and the mats shall cover entire slab. Before connecting the hose on the suction mat to the vacuum pump, the edges of the mat shall be smoothed to enable an airtight seal to be created. A vacuum shall then be applied to the mat. After a minute the gauge on the vacuum pump should indicate a minimum vacuum of 0.70 atmospheres (24.0 in. Hg) and if not, the mat must be checked for leakage. For concrete that dewaters readily the vacuum should then be maintained awt 0.70-0.80 atmospheres (24.0-25.5 in. Hg.) For concrete which dewaters less efficiently (e.g. air-entrained concrete) the vacuum shall then be reduced to 0.50-0.60 atmospheres (15.0-18.0 in. Hg). After approximately 10 minutes the vacuum can then be increased to 0.80 atmospheres.

The vacuum shall be maintained for at least 3 minutes per inch of concrete thickness at 0.80 atmospheres. (Where aggregate hardeners are specified, sufficient moisture shall be maintained to meet manufacturer's requirements). The suction mats and filter pads shall then be removed and moved to the next section in leapfrog manner.

Stop the vacuum dewatering when light footprints only are left in the concrete when stepped upon. A suitable suction time can also be checked with a Proctor-apparatus, which should show 1.5-2 kp/cm2.

4.1.4 Floating

Upon removal of the suction mats and filter pads the concrete surface shall be power-floated without delay until all imprints from the vacuum process are removed. If crusting occurs, the floating operation must be delayed till the concrete carries the machine.

The higher speed is recommended for the floading operation. Two passes with the floating disc should be made in the junction of two mats in order to avoid risk for cracking.

4.1.5 Finishing

The waiting time after the floating operation depends on concrete temperature and humidity and varies from 10 minutes to 2 hours.

The trowelling operation cannot take place before the concrete has hardened enough to carry the machine, i.e. the trowelling blades will not leave any marks on the concrete. Repeated trowelling. With intervals between the passes, which are adapted to the setting of the concrete, greatly improves the surface characteristics. The surface will be more wear resistant and less dusty.

At least two passes are recommended for floors, which are not to be covered.

4.1.6 Curing

Vacuum dewatered concrete should be cured like any other quality concrete in order to achieve a good final result with ponding.

Mode of measurement:

The rate shall be for an unit of one m^3 for item 22 and for an unit of one m^2 for item 23 excluding cost of concrete & steel and including rate of shuttering with MS channels & cutting of grooves is inclusive. The cost of Joint filler shall also be inclusive.

Item-24 Providing and fixing Dholpur stone cladding with 15 - 20 mm thick rough stone of required colour and shade with machine cut edges and cut to required size laid over a base of 30 mm thick bedding / 12 mm thick cement plaster in C.M. 1:4, cement slurry at 4.4 kg / sqm for base and white cement with colour pigment at 2.2 kg / sqm for joints, vertically close jointed, horizontal grooves between two layers and pointed with cement slurry mixed with approved colour pigment to match the shade of the stone, finishing etc. to required level and line, curing, cleaning etc. complete as per directed by Engineer in charge .

1.0 **Materials :** Water shall conform M-1. Cement mortar shall conform to M-11. Dholpur stone shall conform to M-50 and shall be of reasonably uniform colour.

2.0 **Workmanship :**

2.1 ~~Each slab shall be cut to the required size and shape and fine chisel, dressed at all the edges. The sides thus dressed shall have full contact if laid along a straight edge. The sides shall be table rubbed /or rubbled in MS channel with coarse sand, before paving. All angles and edges of the slabs shall be truly square and free form chipping and shall give a plane surface. The thickness of the slab shall be 25 mm. (average) as specified in the item but not less than 20 mm. at any place of the slab.~~

2.2 **Bedding** for the Dholpur/kotah slab flooring shall be of cement mortar 1:4 (1 cement : 4 coarse sand) of average thickness 30 mm and for dado 15 mm thick wired plaster in cement mortar 1:4. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall be then be spread on an area sufficient to receive one kotah slab. The slab shall be washed clean before laying. It shall be laid on top pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden a bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes, as directed.

2.3 While laying, any chiselling which may be required for making the skirting or dado flush with the plaster and/or other finishes shall be done. Necessary grooves of required size in cm., between plaster and/or other finishes, dado or skirting (if required) shall be provided. Forming machine-cut/rounded edges, gutters, sills, platforms, channels, curbing, etc. if any, if required, shall be provided as per the drawing and design.

2.4 In places where full tiles cannot be fixed, the tiles shall be cut to the size and smoothened at edge to give straight and true joints.

2.5 All necessary slopes, gradients and levels shall be truly maintained as required and directed by the Engineer-in-charge.

2.6 The floor shall be kept wet for a minimum period of 7 days, so that bedding and joints set properly.

2.7 ~~**Polishing** shall be normally commenced after 14 days of laying the slab. First polishing shall be done with carborundum of 60 – 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum of 220 to 350 grade grit fitted in the heavy machine. Water shall be properly used during polishing. The flooring shall then be washed clean with water and oxalic acid. As directed by the Engineer-in-charge and as specified in the item, no waxing will be permitted.~~

2.8 If any tile is disturbed or damaged it shall be refitted or replaced, properly jointed and polished.

2.8 The holes required for Nahni traps, pipes any other fittings shall be made without any extra cost.

3.0 Mode of Measurements and Payment :

3.1 Dholpur / Kotah slab flooring shall be measured in $m^{2.}$ for visible area of work done.

3.2 No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 m^2. Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yard. Kotah slabs laid in floor boarders and 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.

3.3 The treads of stairs and steps paved with tiles without nosing shall also be measured under this item.

3.4 The rate shall include the cost of all materials (inclusive of all taxes, levies, and delivery at site), labour & sundry involved in all the operations, at all floors, at any height and level, as described above. It shall also include for breakage and wastage. Floating materials and margin of profit shall also be included. All material samples shall be got approved by the Engineer-in-charge before placing orders.

3.5 No extra shall be paid for any small quantities like narrow widths, mitred & returned ends, rounds & cutting, fixing and making good upto & around pipes, fittings and fixtures etc.

3.6 The rate shall include for fixing the flooring in composite pattern as per the drawings, using different materials and sizes. The measurements of the different materials shall be taken category-wise separately and paid accordingly.

3.7 The rate also included for dismantling of existing flooring with bedding, stacking of useful material, disposing of debris outside campus, cleaning the surface to receive new flooring etc.

3.8 The risers of steps, skirting or dado shall be measured in m^2. Length shall be measured along the finished faces of risers, skirting or dado. Height shall be measured from finished level of treads or floor to top. Lining of pillars shall be measured under this item.

3.9 The rate shall be for a unit of one m^2.

Item-25 Providing and laying average 15 mm. thick single coat smooth finishing using steel float (mala finish) plaster in CM 1:4 (1 cement : 4 coarse river sand), on brickwork / RCC work / blocks / sills / soffits / jambs at all floors / all levels / all heights / all shapes and for all sizes with necessary scaffolding, curing, chicken mesh at the junction of masonry & RCC work using screw / dhoba nails (Mesh will be paid under respective item), making moulded, grooves, drip moulds, tapak etc., for all lead, lift, height and levels etc., complete as per specification and as directed by the Engineer – in – charge.

1.0 Materials: Water shall conform to M-1. The cement mortar of proportion 1:4 shall conform to M-11. Chicken wire mesh having openings 12 mm. x 12 mm. of 24 gauge shall be provided as directed.

2.0 Workmanship:

2.1 Scaffolding: Wooden ballies, bamboo, planks, trestles and other Steel scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster, which shall be independent of the walls. The sample shall be approved by engineer-in-charge before starting the work.

2.2 **Preparation of background:**

2.2.1 The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be roughened by wire brushing if it is not hard and by dense hacking if it is concrete. In case of concrete surface, if a chemical retarder or shuttering oil has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles shall be cleaned off and care shall be taken that none of the retarder is left on the surface. Trimming of projections on brick/concrete surface wherever necessary shall be carried out to get an even surface.

2.2.2 Raking of joints in case of masonry wherever necessary shall be allowed to dry out for sufficient period before carrying out the plaster work.

2.2.3 Scaffolding for carrying out plastering work shall be double scaffolding having two sets of vertical supports so that the scaffolding is independent of the walls.

2.3 **Preparation of Surface :**

2.3.1 All putlog holes in brickwork and junction between concrete and brickwork shall be properly filled in advance. Joints in brick work shall be raked about 10 mm. and concrete surface shall be hacked to provide grip to the plaster. Projecting burrs of mortars formed due to gaps at joints in shuttering shall be removed. The surface shall be scrubbed clean with wire brush/coir 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 two hours before application of plaster.

2.3.2 For external plaster, the plastering operation shall be started from the top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supporting ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

2.4 **Applications of Plaster :**

2.4.1 The plaster about 5 cm. x 5 cm., shall be first applied horizontally and vertically at not more than 2 m. intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upwards and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according to the texture, smooth or sandy granular, as may be required. Excessive Trowelling or over working the float shall be avoided. All corners, arises, angles and junctions etc. shall be carried out with proper templates to the size required.

2.4.2 Cement mortar shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed from the site.

2.4.3 In suspending the work at the end of the day, the plaster shall be left out, clean to line both horizontally and vertically. While recommencing the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and shall not be nearer than 15 cm. to any corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be patched up later on.

2.4.4 Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by hanging mats or gunny bags on the outside of the plaster and by keeping them wet.

3.0 Mode of Measurements & Payment :

3.1 The rates shall include for work at any height, position, and floor and for all necessary scaffolding, etc. as may be required. The rates shall also include for hacking and/or bush hammering to form key for plaster and for spatter dash treatment, as specified, as and where necessary.

The rates shall also include for 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 for groove with cement finish upto 12 mm. x 6 mm. to be formed in plaster at junction of slab and beam and slab and brick without any extra charge. The rate shall also include for similar grooves in plaster at the junction of masonry and wood or steel door/window/ventilator frame or at bottom of beam/lintels as drip moulds without extra charge.

3.2 All plastering shall be measured in $m^{2.}$, unless otherwise specified. Length, breadth or height shall be measured correct to a centimetre.

3.3 Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooved or open joints in brick work, stone work, etc. or space between laths. **Thickness of plaster shall be average thickness with minimum 15 mm., at any point on the surface.**

3.4 The measurement of wall plastering shall be taken between the walls or partitions (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

3.6 Soffits of stairs shall be measured as plastering on ceilings. Flowing/folding soffits shall be measured separately.

3.7 For jambs, soffits, sills, etc., openings exceeding 0.5 sqm and not exceeding 3.0 sqm, area deductions and additions shall be made in the following manner: -
(a) No deductions shall be made for end joints, beams, posts, etc. for openings not exceeding 0.5 sqm. each and no addition shall be made for reels, jambs, soffits, sills, etc. of these opening for finish to plaster around ends of joints, beams, posts, etc.
(b) Deduction for openings exceeds 0.5 sqm. but not exceeding 3.0 sqm. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills, etc. of these openings.
(i) When both faces of any wall are plastered with same plaster, deduction shall be made for one face only.
(ii) When two faces of any wall are plastered with different types of plasters or if one faces is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, windows, etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case may be.

3.8 For openings having door frames equal to projection beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall. Jambs , soffits and sills shall be measured separately and paid for.

3.9 In case of openings having area above 3.0 m2. each, full deduction shall be made for the opening but jambs, soffits, and sills shall be measured additionally.

3.10 Providing and fixing of 150 mm wide chicken mesh jail at junction of RCC and brick masonry using screw / dhoba nails, shall be paid under respective item.

3.11 The rate shall be for a unit of one $m^{2.}$

Item-26 Providing and applying 20mm thick sand faced plaster (Using Wooden Gutka/Float) to all external surfaces at all levels and in any shape, in two coats, 12 mm thick average base coat in cement mortar 1:5 and 8mm thick finish coat in cement mortar 1:2 using fine sand for finish coat, including preparation of surface to uniform texture, staging, double scaffolding, curing, chicken mesh at the junction of masonry & RCC work using screw / dhoba nails (Mesh will be paid under respective item), making moulded, grooves, drip moulds, tapak etc., for all lead, lift, height and levels etc., complete as per specification and as directed by the Engineer – in – charge.

All the relevant specifications for materials and scaffolding of item No. 25 shall be followed except.

1.0 <u>Sand Faced Plastering</u>

Surface Preparation - The joints shall be raked out properly and dust and loose mortar shall be brushed out. Efflorescence, if any shall be removed by brushing out and scrapping.

The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced.
Application of Plaster - Plaster shall be applied in two coats namely, 12mm undercoat and 8 mm finishing coat. Ceiling plaster shall be completed before commencement of wall plaster. Plastering shall be started from top and work down towards the floor. All putlog holes shall be properly filled in advance of plastering.

12 mm Thick Undercoat - First, plaster of 12 mm thick and 150mm x 150 mm shall be applied horizontally and vertically at not more than 2 m intervals over entire surface to serve as gauges. The plaster shall be applied in uniform surface slightly more than 12 mm thick and then brought to a true surface, by working a wooden straight edge reaching across the gauges, with small upwards and sideways movements at a time. The surface shall be left rough and furrowed 2 mm deep with scratching tool diagonally both ways to form key for finishing coat. The surface shall be kept wet till finishing coat is applied.

Mortar - Mortar for undercoat shall be one cement + five sand (1:5) by volume.

8 mm Finishing Coat - The finishing coat shall be applied after the undercoat has sufficiently set but not dried and in any case within 48 hours. Sand to be used for second coat shall be sieved. Sand passing through 3 mm sieve shall be taken for the second coat. The sand shall be of uniform size so that when sieved through a sieve of 50 mesh not more than 10% shall pass through. The second coat shall be struck uniformly over the first coat and firmly pressed and levelled using a batten. The surface then shall be firmly trowelled and sponge floated to remove excess moisture and bring the sand to the surface. The surface thus prepared shall be uniformly roughened for texture, by running a fine wire brush lightly over the surface, if necessary.

2.0 **Mortar** - Mortar to be used for this coat shall be 1 cement + 2 sand, by volume.

The surface of plaster shall be kept wet for at least 7 days and shall be protected from the sun.

General - All corners, angles, arrises and junctions shall be truly vertical and horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises, angles, etc. where required shall be done without any extra cost. Such rounding or chamfering shall be carried out with proper templates to the size required.

In suspending work at the end of the day, the plaster shall be left, cut clean to line both horizontally and vertically. When recommencing the plaster, the edge of the old work shall be scraped, cleaned and wetted with water before plaster is applied to the adjacent areas. Plastering work shall be closed at the end of the day on the body of the wall and not nearer than 150 mm to any corners or arrises. It shall not be closed on the body of features like bands, cornices, etc. and not at the corners. Horizontal joints in plaster work shall also occur on parapet top and copings.

The thickness of the plaster specified shall be measured exclusive of the thickness of the key, i.e., grooves or open joints in the masonry. The average thickness of the plaster shall not be less than the specified thickness. The minimum thickness over any portion of the surface shall not be less than specified thickness by more than 3 mm.

The curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages at the Contractor's expense by means as the

Engineer may approve. The dates on which plastering is done shall be legibly marked on the various sections plastered to help watching of curing period.

For plastering work; double scaffolding having two sets of vertical supports shall be provided so that scaffolding is independent of walls. The Contractor shall be responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads to come upon it.

3.0 Mode of Measurements and Payment:

The relevant specifications of item No. 25 shall be followed. The rate shall be for all floors, all heights, all levels and all shapes.

The rate shall be for an unit of one m^2.

Item-27 Providing and applying Sunken/Ruled Point to the Stone Masonry in CM 1:3 (1 Cement: 3 Fine Sand) including raking out joints, cleaning with wire brush, curing, finishing neat, scaffolding for all heights and depths above or below the highest plinth level etc complete as per specification and as directed by the Engineer – in – charge.

All the relevant specifications for materials and scaffolding of item No. 25 shall be followed except.

The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any, shall also be removed by brushing and scrapping. The surface shall be thoroughly washed with water, cleaned and kept wet before pointing is commenced.

Mortar: Mortar mix for pointing shall be as described in the schedule of quantities. Specifications for cement, sand and water shall be as described herein before for concrete works.

Application of mortar & finishing: The mortar shall be pressed into the raked out joints with a pointing trowel, flush, sunk, ruled or raised according to type of pointing specified in the schedule of quantities. The mortar shall not spread over the face of brick work or stone work, corners, edges of the masonry but restricted to the width of joints only.

The super-fluous mortar shall then the struck off and the surface of the masonry shall be cleaned off completely. The finish shall be such that the pointing is to the exact size and shape stipulated and the edges are straight, neat and clean. The pointing lines shall be straight, regular and uniform. No false joints shall be allowed.

Curing: The pointing shall be kept wet for atleast seven days. During this period it shall be suitably protected from all damages.

Types:

(a) Raised and Cut Pointing : Raised and cut pointing shall project from the wall facing with its edges cut parallel so as to have a uniformly raised band about 6 mm. raised and width 10 mm. or more as directed.

(b) Flush Pointing : The mortar pressed into the joints shall be finished off flush and level with the edges of bricks, tiles or stones so as to give a smooth appearance. The edges shall be neatly trimmed with a trowel and straight edges.

(c) Ruled Pointing : The joints shall be initially formed as for flush pointing and then while the mortar is still green, a groove of shape and size as directed shall be formed by running

a forming tool straight along the centre line of the joints. This operation shall be continued till a smooth and hard surface is obtained. The vertical joints shall also be finished in a similar way. All vertical lines shall make true right angles at their junctions with horizontal lines and shall not project beyond the same.

Mode of measurement: The area of surface actually pointed will be measured net and shall be paid for. The measurement of length and height of walls pointed shall be taken correct to a centimeter. All the openings of doors, windows, ventilators etc. shall be deducted and jambs, soffits, sills etc. if pointed will be measured to arrive at the net area for the payment. The rate shall include cost of all materials, labour, transport, scaffolding, curing etc. The relevant specifications of item No. 25 shall be followed. The rate shall be for all floors, all heights, all levels and all shapes.

The rate shall be for an unit of one m^2.

Item-28 Providing and fixing GI chicken wire mesh of size 12mm size of 24 gauge at the junction of dissimilar surfaces of brick masonry wall and RCC surfaces (such as columns, beams, coping) including necessary nails / Dhoba for fixing etc. for all lead, lift, height and levels etc., complete as per specification and as directed by the Engineer – in – charge.

1.0 Material: Chicken wire mesh having openings **12 mm. x 12 mm. of 24 gauge** shall be provided as directed.

2.0 Workmanship:

The mesh is to be fixed with nails and cement paste at the junctions of different materials (column and brickwork, at beam bottom level- on the face of beam and brickwork) to avoid cracks in the plaster

Chicken mesh shall be fixed in advance of the plasterwork. Chicken mesh shall be fixed in such a way that it is totally concealed in the plaster. Chicken mesh shall be fixed in such a way that minimum75mm mesh is provided on either side of the joint. The mesh shall be fixed with both the elements with the help of nail/ screws. Drilling shall be carried out if required in RCC member.

The mesh shall be over lapped by 15 cms in the length while joining the two pieces of mesh and also at corners.

3.00 Mode of measurement and payment:

The item will be measured and paid in sqm. Only clear visible area will be measured and paid. No extra payment shall be done for over lapping of mesh.

Item-29 Providing and applying of Painting internal old painted surface / new plastered surfaces with two or more coats of PREMIUM EMULSION PAINT of approved brand and colour (Asian "Apcolite premium emulsion"or Dulux "super clean" or Berger "Rangoli" or equivalent) to give an even shade with required finish over & including cost of a coat of water thinnable cement primer including removing of old paint, scrapping the surfaces using sand papers of appropriate grades, cleaning the surfaces, filling the cracks and crevices with approved filler material (Dr. Fixit Crack X or equivalent) and making extremely smooth surfaces using BIRLA Putty in Two or more coats , making the edges & corners of beams / walls straight & sharp, inline & level with excellent workmanship in surface preparation including

scaffolding etc; complete all as directed by Engineer in charge at all heights, in all floors. Using one or more colour combination as approved by engineer in charge.

1.0 Materials :

1.1 The Paint shall conform to M-44. The Premium emulsion paint shall be obtain directly from approved manufacturers or approved dealers such as Asian "Apcolite premium emulsion"or Dulux "super clean" or Berger "Rangoli" or equivalent and shall be brought to the site in original airtight containers with seal intact. The water shall of good quality potable. The **cement primer** shall be same approved manufacturers only.

1.2 All the materials not in actual use shall be kept protected, lid of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of water to prevent formation of skin. The materials, which have become stale or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into small containers. While applying also, the paint shall be continuously stirred in smaller containers. No left over paint shall be put back into stock tins when not in use. The paint shall be stirred thoroughly in its container before pouring into small containers.

1.3 If for any reasons, thinning if necessary, water shall be added as per supplier's instructions.

1.4 The materials required for work of painting work shall be obtained directly from approved manufacturers or approved dealer and brought to the site in maker's drums, cage etc. with seal unbroken.

2.0 Workmanship :

2.1 **Scaffolding :**

Where scaffolding is required, it shall be erected in such a way that as far as possible, no part of scaffolding shall rest against the surface to be distempered. A properly secured strong and well tied suspended platform (Zoola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary and the floor area shall be covered with plastic so that the flooring is not spoilt.

2.2 **Preparation of surface :**

2.2.2 The surface shall be thoroughly cleaned of all dust, dirt, mortar dropping and other foreign matter before white wash is to be applied.

2.2.2 The surface spoiled by smoke soot shall be scrapped with steel wire brushes or steel scrapers or shall be rubbed with over burnt surkhi or brick bats. The surface shall be then broomed to remove all dust and dirt and shall be washed with clean water.

2.2.3 Oil or grease spots shall be removed by suitable chemical. Smooth surfaces shall be rubbed with wire brushes.

2.2.4 The undecorated surface to be painted shall be thoroughly brushed from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for atleast 2 months before applications of paint prior to painting. No painting on exterior

or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surfaces shall be thoroughly dry before painting work is started.

2.2.5 All unnecessary nails, hooks etc. shall be removed. Pitting in plaster shall be made good with plaster again and papered with a fine grade sand paper and made smooth. A coat of paint shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of paint is applied. The surface affected by moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with IS : 2395 (Part-1)-1966.

Preparation of Mix: This shall be done as per the manufacture's instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added to shall be as per manufacturer's instructions.

2.3 **Priming coat :**

2.3.1 A priming coat of interior / exterior cement primer of approved manufacture shall be applied over the papered surface in case of new work or undecorated surface. If the distemper priming is done after the plastered wall surface dries completely, the distemper primer shall be avoided.

2.3.2 Application of primer and putty shall be done as under :

The primer shall be applied with a brush on the clean, dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. A coat of cement based putty (lapi) shall be applied to the entire surface. Putty shall be used of readymade or brought of the company like Birla white or JK as directed by the Engineer-in-charge. The second coat of primer and putty shall then be applied and it shall thereafter be allowed to dry for atleast 48 hours before oil bound distemper or paint is applied.

2.4 **Application of paint:**

2.4.1 Before pouring into small containers for use of applying, the paint shall be stirred thoroughly in its container. Also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

2.4.2 The paint shall be laid on evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of moldings etc. shall be left on the work.

2.4.3 On the newly plastered surface, the first coat shall be applied with 100% dilution and second and third coat shall be applied with 40 % dilution or as per the supplier's instructions. The second or subsequent coat shall not be started until the preceding coat has become sufficiently hard to resist marking of the brush being used.

2.5 **Precautions:**

(a) Old brushes if they are to be used with paints, shall be completely dried of turpentine or oil paint by washing in warm soap water. Brushes shall be quickly washed in water immediately after use and shall be kept immersed in water during break periods to prevent the paint from hardening on the brush.
(b) In the preparation of walls for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes etc.
(c) Splashes on floors etc. shall be cleaned out without delay, as they will be difficult to remove after hardening.
(d) Washing of surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application.

2.6 **Protective measure :**

2.6.1 The surface of doors, windows, ventilators, floors, of furniture etc. and such other parts of the building not to be white/colour washed shall be protected from being splashed upon. Such surfaces shall be cleaned of white/colour wash splashed, if any, immediately after completing the painting, at no extra cost.

3.0 Mode of Measurements and Payment :

3.1 Priming coat of exterior primer, scraping of surface spoiled by smoke soot, removal of oil and grease spots, treatment for infection of efflorescence, mould, moss, fungi, algae and lichen and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

3.2 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 m^2.
All work shall be measured in m^2. No deductions shall be made for ends of joints, beams, posts etc. and openings, not exceeding 0.5 m^2. 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.

3.3 Deductions of opening exceeding 0.5 m^2. but not exceeding 3.0 m^2. 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.

3.4 In case of opening of area exceeding 3.0 m^2. each, deduction shall be made for openings but jambs, sills and soffits shall be measured.

3.5 No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

3.6 Corrugated surfaces shall be measured flat as fixed and not girth. The quantities measured shall be increased by the following percentage and the resultant shall be included with the general areas:

(a) Corrugated steel sheets	14%
(b) Corrugated A.C. Sheets	20%
(c) Semi corrugated A.C. Sheets	10%
(d) Nainital pattern roof (Plain sheeting with rolls)	10%
(e) Nainital pattern roof (with corrugated sheets)	25%

3.7 Cornices and other wall features, when they are picked out in a different finish/colour shall be girthed and included in the general area.

3.8 Item includes removing nails, making good holes, cracks, patches with materials similar in composition of distemper.

3.9 The rate includes cost of all materials, labours, 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.

3.10 The rate shall be for a unit of one m^2.

Item-30 Providing and Applying two coats of Synthetic enamel paint on old MS hollow section railing members and plates using 1st quality paint from approved manufacturer "Asian, Berger, ICI, Nerolac, Dulux or equivalent ISI " of approved colour and shade to give an even shade including scaffolding, removing of paint that is soft, blistered, loose or flanking & cleaning old surface, preparing the surface to receive paint including filling cracks and creaves with approved filler materials, applying oil based putty and oil primer coats / anti corrosive metal primer to steel work and cost of paint, thinner, filler, putty, primer and other materials, necessary labours etc. complete as per specification and as directed by Engineer in charge at all heights, in all floors. (Surface area of the painted surface, MS hollow section, plates shall be measured and paid)

1.0 **Materials:**

Paint and primer to be used for the various items of work should be of approved make viz. "Asian, Berger, ICI, Nerolac, Dulux or equivalent ISI "and shall be applied as per specification of the manufacturer. Paints appropriate for the surface to be painted shall be used. For painting on steel works IS: 1477 Part I & II latest and IS:8629 latest should be followed.

General : The materials required for work of painting work shall be obtained directly from approved manufactures or approved dealer and brought to the site in maker's drums, kegs, etc., with seal unbroken.

All materials not in actual use shall be kept properly protected, lids of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become state or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring in to small containers. While applying also, the paint shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.

If for any reasons, thinning is necessary the brand of thinner recommended by the manufacturer shall be used.

2.0. **Workmanship**

2.1 **Scaffolding** : The relevant specifications of item No. 29 shall be followed.

2.2 **Preparation of the surface** : The relevant specifications of item No. 29 shall be followed. The surface shall be cleaned properly and rubbed down with sand paper to ensure proper adhesion. The surface to be painted shall be thoroughly cleaned, dusted and descaled by through wire brushing or other mechanical means or by using chemical rust remover while cleaning with power wire brush in case of steel section. All rust, dirt and grease shall be thoroughly removed before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surfaces shall be thoroughly dry before painting work is started. All small holes, cracks, open joints etc. shall be closed with approved putty. The Putty shall be made as per the instruction of Engineer-in-charge. A coat of primer paint should applied on steel surface as per IS 102 or IS 104 or IS 2074 where required or where surface is rusted.

2.2 **Application of Paint**

(a) Brushing operations are to be adjusted to the spreading capacity advised by the manufacture of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in a directions at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The fill process of crossing and laying off will constitute one coat.

(b) Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of sand-paper and loose particles brushed off before next coat is applied . Each coat shall vary slightly in shade and shall be got approved from Engineer-in-charge before next coat is started.

(c) Each coat except the last coat shall be lightly rubbed down with sand paper of fine pumice stone and cleaned dust before the next coat is applied. No hairmarks from the brush or clogging of paint puddles in the corners of panels, angles of moulding etc. shall be left on the work..

(d) Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved best quality brushes shall be used.

(e) **Protective measure** : The relevant specifications of item No. 3 shall be followed. However care shall be taken to protect the fittings, fixtures, glass etc. which are not to paint.

3.0 **Mode of measurement :**

3.1 All the work shall be measured in the decimal system as under :

(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 Sq.M.

3.2 For Doors & Windows Different surfaces may be grouped into one general items, area of uneven surfaces being converted into equivalent plain areas in accordance with Table as follows.

EQUIVALENT PLAIN AREAS OF UNEVEN SURFACES

Sr. No	Description of Work	How measured	Multiplying Factor
1	nelled or Framed and brased or Ledged and battened or ledged, batten-battened and braced joinery	leasured flat (not girthed) including CHOWKAT or frame. Edges, chocks, etc shall be deemed to be included in the item	1.30 (for each side)
2	ısh joinery	o as per above	1.20 (for each side)
3	ısh shutter	leasured flat overall	1.20 (for each side)
4	ısh glazed or gauzed joinery	o as per item no. 1	0.80 (for each side)
5	lly venetianed or louvered joinery	o as per above	1.80 (for each side)
6	el rolling shutter	leasured flat (size of opening) overall ; jamb guides, bottom rails and locking arrangement etc. shall be included in the item (top cover shall be measured separately)	1.10 (for each side)
7	ain sheet steel doors and windows	leasured (not girthed) flat including frames, edges etc.	1.10 (for each side)
8	lly glazed steel doors and windows	leasured (not girthed) flat including frames, edges etc.	0.50 (for each side)
9	rtly glazed and partly panelled steel doors and windows	leasured (not girthed) flat including frames, edges etc.	0.80 (for each side)
10	ain link fencing	leasured (not girthed) flat including frames, edges etc	50 (for each side)

Note : Where doors and windows etc are of composite types other then those included in this table, different portions shall be measured separately with their appropriate coefficients, centre line of common rail being taken as the dividing line between two portions.

3.3 For painting to MS railing, poles etc., the surface area of the pipe, angle or other sections should be measured in Sqm / Surface area.

3.4 The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. at all height, lead and lift involved in all the operations described above.

Item-31 Providing and Applying two or more coats of Exterior 100% Acrylic water proof paint including suitable exterior acrylic prime coat using 1st quality paint from approved manufacturer "APEX Ultima Exterior Emulsion – Asian or Weathershield powerflexx paint - Dulux " of approved colour and shade to give an even shade walls, beams, ceilings including scaffolding, cleaning and preparing the surface to receive paint including filling cracks and creaves with approved filler materials and cost of paint, acrylic exterior primer, thinner, filler, other materials, necessary labours etc. at all height completed as per specification and as directed by Engineer-In-charge.

1.0 Materials :

1.5 The Exterior Acrylic Textured Matt water proof paint shall be obtain directly from approved manufacturers or approved dealers such as APEX Textured Exterior Emulsion – Asian, Weather coat – Berger, Nerotex Matt (Texturised) – Nerolac and shall be brought to the site in original airtight containers with seal intact. The water shall of good quality potable. The relevant specifications of item No. 30 shall be followed.

2.0 Workmanship :

The relevant specifications of item No. 29 shall be followed.

3.0 Mode of Measurements and Payment :

The relevant specifications of item No. 29 shall be followed.

Item-32 Providing and laying 230mm to 300mm thick (consolidated thickness) black trap rough stone soling using 0.80cum of 230mm stones and 0.25cum of 40mm to 80mm black trap stones and 0.20cum of approved graded gravel per one cum of consolidated soling including hand packing in regular lines, filling interstices, watering, consolidating with power roller including watering, hire charges for road roller, etc.; complete all as per specifications. (Consolidated thickness shall be measured for payment)

1.0 Materials :

1.1 Stone and stone chips shall conform to M-16 and Murrum brought from outside shall be clean, of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicones materials and natural mixture of clay of calcareous origin. The size of murrum shall not be more than 20 mm. and shall be approved by the Engineer-in-charge.

1.2 Rubble stones 150 mm. to 230 mm. size shall be collected by the Contractor to the site of work. Stacking shall be done in systematic way so as to allow easy inspection and in such a place as will not cause any loss. The rubble shall be collected from approved quarry situated around Himmatnagar or from quarry approved by the Engineer-in-charge.

1.3 The control on quality of material shall be exercised by the Engineer by carrying out the required tests at the frequencies as per IS norms from time to time as directed by the Engineer-in-charge.

1.4 The sample of the rubble collected shall be got tested at Govt. recognised laboratory. The cost of the same shall be born by the Contractor.

1.5 Materials for the purpose shall be of approved quality. Any material which is found of inferior quality shall be rejected and the Contractor shall remove such rejected material from the site at his own cost immediately.

1.6 The materials shall be got approved by Engineer-in-charge prior to collection on site. It shall be free from all rubbish, dust and any organic materials as well as clods of black cotton soil. Material shall not be allowed to be collected within the road boundary. Material to be used as crust and for side shoulders shall have a C.R.B.I's report and that to be used as blindage in W.B.M. road construction shall have P.I. Value of less than 6, as determined in accordance with IS:2720 (Part-V). The material to be used should be got tested prior to use in road construction. Testing charges shall be borne by the Contractor.

2.0 Workmanship :

2.1 The first layer of stone, of average size 150 to 230 mm. shall be laid in roads, pavings etc. Thereafter, the voids between the stones laid in the first layer shall be filled by hand packing the stones of smaller size or stone chips of the same stones, as directed. The voids shall be filled with largest possible stones. The layers then shall be rammed well and consolidated.

2.2 The surface of the stone layer then shall be covered and levelled with a layer of murrum. This then shall be watered and well consolidated using power driven rammers or rollers as directed. The consolidated thickness of the above layers totally should be average 23 cm. thick.

2.3 Collection of the materials shall be completed in whole, campus wise, as per the final requirement and measurement shall be recorded. Until the quantity of materials as per the final requirement is not collected work shall not be started and payment shall not be done.

2.4 Stacking of material as per requirement shall be carried out. The collection shall always commence at one end of the road and carried out continuously towards the other end unless the Engineer-in-charge shall direct otherwise.

2.5 It shall be spread evenly on the prepared surface in required grade and camber by using camber broads etc. so as to ensure that the surface is in true camber and grade. At least two camber boards shall be in use on site. The surface shall be checked at every 50 ft. by means of templates, while the correctness of the camber in between shall be tested by strings and corrected as required. Between the straight lengths and the curves and the meeting points of the convex and concave portions of reverse curves the change in camber of the road and super elevation shall be made very gradually as directed by the Engineer-in-charge.

2.6 Rubble shall not be spread without permission of the Engineer-in-charge. Rubble should be spread under careful supervision and by trained collies only. Contractor shall see that uniform spreading as per collection of rubble is done. The Contractor shall spread the rubble fully from the stacks without keeping any balance unless directed by the Engineer-in-charge to keep some stacks in balance for making unevenness or depressions good during rolling work.

2.7 To ensure that the materials are spread to the required thickness, the road surface shall be marked out on to the length over which the contents of stacks are to be spread. The bounds of earth or murrum (one on either side) shall be made along the outer edge of soiling simultaneously with spreading of rubble. These bounds shall be laid with a distance equal to the width of the road to be metalled and shall be enough to prevent the loose rubble from spreading out during consolidation and to retain water used for consolidation as well.

2.8 At the time of rolling, all surface irregularities hollows, depressions, humps, shall be set right.

3.0 Mode of Measurement and Payment :

3.1 Payment shall be made on m^3 basis.

3.2 The rate includes the cost of collecting, carting stones and murrum, with all leads, lifts and labour for laying, hand packing and consolidating the same for roads, pavings, etc.

3.3 The contract unit rate for collecting, carting and stacking shall include :

1. Obtaining rubble from approved quarry at Vadagam or nearby place as approved by the Engineer-in-charge.
2. Transporting at site.
3. Storing, stacking and protecting.
4. Keeping record of supply and use.
5. Testing the samples in the approved laboratory.

3.4 The rate includes digging the murrum, supplying, conveying with all lead and lift on the road side and stacking the same in regular stacks of the required dimensions, spreading, etc. complete. Material shall be collected in required quantity at any stage of work.

3.5 The rate shall be for a unit of one m^3 and includes all the above operations with all lead and lift.

Item-33 & 34 Providing and laying 100 mm / 300 mm diameter non pressure reinforced cement concrete Hume pipes of approved NP2 class quality including excavation, laying the pipes as per required line, level, slope and drawing, filling the joints with stiff mixture of cement mortar 1:1 (cement 1 : sand 1) and jute, curing, testing the pipes and supporting with earth, making holes in wall and finishing of the same for all lead, lift, height, levels etc., complete as directed by the Engineer–in–charge.

1.0 **Materials**: The reinforced concrete non-pressure pipes of specified diametre shall conform to relevant IS : 458-1971. The reinforcement cement concrete pipe shall be manufactured by centrifugal (or Spun) process. All the pipe shall be true to shape, straight, perfect, sound and free from cracks and flaws. The external and internal surface of the pipe shall be smooth and hard. The pipe shall be free from defects resulting from imperfect grading of the aggregate, mixing or molding. Water shall conform to M-1. Cement shall conform to M-2. Sand shall conform to M-3. The cement mortar of proportion 1:1 shall conform to M-11.

2.0 **Workmanship**:

2.1 **Laying of RCC spun pipes:**

No pipes shall be laid till the drain and its levels and gradients carefully checked and tested and found correct by the Engineer-in-charge.

For excavation and refilling of trenches relevant civil specifications shall be followed respectively. After the concrete cradles have been laid properly, where specified in the schedule, RCC spun pipes shall be lowered gradually into the trenches over the concrete cradle or bed. Holes for collars shall be made at every joint. These holes shall be made depending upon the particular length of the pipe being laid. The pipes shall be levelled properly to the required slope and gradient. The pipe drain shall rest on the bed at every point throughout its length. To ensure this, the space between the under side of the pipes and the invert of the cradle shall be carefully

grouted solid with thin cement slurry consisting of 1 cement:3 clean washed sand, in such a manner that no voids shall be left. This is to ensure that the load of the pipes and the superimposed load of the earth filling shall be evenly distributed on the cradle or on firm ground on which the pipe is resting.

All precautions shall be taken to the full satisfaction of the Engineer-in-charge and the pipes shall be gradually lowered on the cradle or on firm ground. After the alignment of pipes is checked by the authorised representative of the Institute, the grouting shall be done without any extra charges by the Contractor. The cradle of concrete shall be allowed to set atleast for 3 days, before any pipes are placed in it and the contractor shall take due care in setting the pipe in the cradle so that no damage to the cradles shall occur. If any damage to the cradle occurs, it shall be rectified to the satisfaction of the Engineer-in-charge and in any particular case where the damage, in the opinion of the Engineer-in-charge has adversely affected the structural strength of the cradle. The Contractor shall remove the damaged section of the cradle and replace it at his own expenses, to the complete satisfaction of the Engineer-in-charge.

2.2 **Joints:** The joints for the pipes shall be made by loose collars and the connecting space shall be as minimum as possible. The collars shall be specially roughened inside to provide a better grip.

Two adjacent pipe ends when butted together concentrically, a dowel will be left between the two ends. In this dowel, CM 1:1 or collar shall then be adjusted over the pipe so that its ends are equidistant from the pipe ends and is concentric with the pipe. The space between the collar and the outer barrel of the pipe can then be caulked with bitumen soaked hemp yarn in layers atleast upto 50 mm (and not exceeding 80 mm) from the joint on its either side. The remaining space on either side of the joint upto the collar shall then be caulked with a stiff mix of CM 1:1. Every joint shall be finished smooth at an angle of 45^{O} with the longitudinal axis of the pipe on either side of the collars.

The interior of the pipe drains shall be cleaned off of all dirt, loose mortar and superfluous materials, after jointing.

2.3 **Curing:** Every joint shall be kept wet for about 10 days for maturing. The section of the pipe line laid and joined shall be covered immediately to protect from weather effects.
The joints shall be left exposed for observation.

2.4 **Testing of RCC spun pipes:** After joints have been allowed to settle sufficiently, the pipe shall be tested under a head of atleast 0.6 m above the top of the highest pipe in the stretch and in no case under a head greater than 6 m of water column at the highest level.

Any defects found in the joints shall be immediately rectified or redone and any pipe which is found to be leaking, shall be removed and replaced. The defective pipe shall be removed from the site immediately, thereafter.

3.0 Mode of Measurements and Payment:

3.1 The work of preparing the trench bed to fit the lower part of the pipe and `Grips' left to take socket, collars, etc., shall be included in the rate of laying the pipes. The measurements shall be net without any allowance for cutting and waste. The rate shall be included for **necessary civil work like, excavation, refilling trenches, etc.,**

3.2 The measurement shall be net without any allowance for cutting and waste. The length of bends, junctions and other connections (measured along the centre line) shall be included in the total length of the pipes, the connections being numbered afterwards and paid for extra over pipes.

3.3 The size of bends, junctions etc., shall suit to the size of the pipe. The bore (internal diameter of pipe) shall be the criterion for payment.

3.4 Nothing extra shall be paid separately for the use of mechanical appliances, where necessary.

3.5 The rate shall be for a unit of one Rmt.

Item-36 to 42 Demolishing P.C.C./ R.C.C./ brick masonry/ stone rubble masonry work including cutting of bars and cleaning of rust in RCC, making the surface rough for proper bonding, disposing off the debris outside camp at any leads and lifts, scaffolding etc., for all lead, lift, height and levels etc., complete as directed by the Engineer – in – charge.

1 Workmanship :

✸ **General rules for Demolition / Dismantling :**

1.1 The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant item as specified or shown in the drawings.

1.2 The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the architect before starting the work. This however will not absolve the Contractor from the responsibility of proper and safe demolition.

1.3 Necessary dropping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damages is caused to the adjoining property.

1.4 Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5 Dismantling shall be commenced in a systematic manner. All materials, which are likely to be damaged by dropping from a height or demolishing roof, masonry etc., shall be carefully dismantled first. The dismantled articles shall be properly stacked, as directed.

1.6 All materials obtained from demolition shall be the property of the Client unless otherwise specified and shall be kept in safe custody until handed over to the Institute.

1.7 Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed, with all lead and lift. All unserviceable materials, rubbish, debris etc. shall be stacked and disposed at any leads and lifts as directed by Engineer-in-charge.

1.8 On completion of work, the site/surface/area shall be cleared of all debris rubbish and cleaned, as directed.

2 **Dismantling :** The flooring / plaster etc; shall be thoroughly removed by scraping, chiseling or other means. Than the surface shall be thoroughly scrapped with wire brushes and coir brooms, so as to free from loose materials. The surface shall be thoroughly cleaned of all dust, dirt, mortar cropping and other foreign matter.

2.1 The surface spoiled by smoke soot shall be scrapped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brickbats. The surface shall be broomed to remove all dust, dirt and shall be washed with clean water. Oil or grease spot shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

2.2 All unsound portion of the surface shall be removed to full depth of in rectangular patches and plaster again after racking the masonry joints properly, such portion shall be wetted and allowed to dry before plaster. Splashing and dropping if any on the floor, wall, cladding, doors, windows, ventilators & others shall be removed and the surface cleaned.

2.3 Scraping of the surface etc., surface spoiled by smoke soot removed of oil and grease spots, patch repairs to plaster wherever done shall not be paid extra. The surface effected by moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with IS 2395 (Part-I) 1966 where required and directed by Engineer-in-charge & no extra payment shall be given for the same. On completion of work, the site shall be cleared of all debris rubbish and cleaned, as directed.

3.0 **Mode of Measurements and Payment :**

3.1. Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

3.2. All work shall be measured in decimal system as fixed in its place subject to the following limits, unless otherwise stated hereinafter (a) Dimensions shall be measured to the nearest 0.01 m. (b) Area shall be worked out to the nearest 0.01 m^2. (c) Cubical contents shall be worked out to the nearest 0.01 m^3.

3.3. The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for cleaning of the rust from the bar, making the surface rough for proper bonding etc. The rate also includes for temporary storing for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

3.4. The rate shall be for an unit as given in detailed bill of quantity

Item-43 & 44 Providing and fixing at all heights/in all floors with all leads powder coated / Anodizing (20 microns) best extruded Aluminum sections for partitions / Grill frames manufactured from JINDAL / INDAL or equivalent make confirming to ISI, cut to length, joints mitered and corners grinded with joints water proof the outer frame and shutter frame stiffened with corner angle strips, fixing the frame with masonry and RCC, the frame work fixed with standard approved fastenings all generally as per details shown in drawings and specification with all the section pretreated for removal of any rust and prevention of further

rust formation and finished with powder coating / Anodizing of approved shade including cost of fixtures for hinged openings (arrangement with steel bearings wherever necessary), cost of providing and fixing aluminum decorative handles, door fittings like tower bolts, door stopper etc. of approved quality and required size, cost of filling of silicon sealant at gaps if any (Aluminum beading and glazing clips measured and paid under this item only)

Or

.-Do- as per above item No 43 but for door styles and rails (Aluminum beading and glazing clips required for door measured and paid under this item only) including fittings etc

1.0 ALUMINUM DOORS, WINDOWS AND VENTILATORS

Material: Aluminum alloy used in the manufacture of doors, windows and ventilators shall conform to IS designation HE 9-WP of IS : 733. The sectional properties of extruded sections shall be as given in IS:733 or as manufactured by approved manufacturer (as per list of approved makes). The section shall be uniform in appearance, free of die lines and handling marks.

The rate for various items shall include the following :

(a) Providing and applying electrostatically polystyrene base powder coating of 50 micron or 20 micron color anodised of approved make and shade and oven baking the same at required temperature to give even shade and finish. The rate shall also include for required pre-treatment to sections such as cleaning, buffing, chromating etc. complete as per approval of Engineer-in-charge. The Tenderer has to submit their powder coating process/anodizing process by which they wish to perform the work. The thickness measuring instruments shall be brought on site as an when required to check the thickness

The Contractor shall have to give a guarantee bond, for powder Coating, on appropriate Stamp paper for a period of 5 years. In this period he shall attend to and rectify all complaints without causing any inconvenience to the Institute. The form of Guarantee Bond shall be as prescribed below :

"I/We ..... (Contractor) hereby guarantee that work shall remain unaffected and shall not be in any way damaged by atmospheric conditions, for a period of 10 years after the completion of the work of Powder Coating the aluminium doors as per the terms and conditions of the Contract and guarantees to redo the affected work without claiming any extra cost."

(b) In case of alteration items of M.S.windows standard "Z" sections M.S.rolled or fabricated sections as per requirement are to be used matching to the respective aluminium sections. The windows shall be painted with two coats of enamel paint (of approved make and shade) over two coats of zinc chromate yellow oxide and with steel putty etc. complete as per design, direction and approved sample.

(c) The windows and doors are to be fixed with the external finished surface (either stone cladding/external plaster) and hence all the necessary rubber strips, IS 710 ply packing and approved make & color neutral grade silicon sealant with polyurathene back up rod (between the frame and concrete or other surface all around) shall be provided within the rate quoted so as to make the junctions fully water tight/air tight.

(d) Approved make selected float glass (plain or frosted) of approved /required thickness/thickness as specified shall be used in doors. Wired glass louvers/plain glass louvers with ground edge shall be provided wherever shown on drawings.

(e) Necessary locking arrangement of approved design shall be provided as per drawing & as directed by Engineer –in-charge

(f) Wherever necessary EPDM rubber or wool piles etc. shall be provided for air/water tightness of approved design shall be provided as per drawing & as directed by Engineer –in-charge

(g) Necessary operating device (as per design) for operation of louvers of windows, ventilators, sky lights, including necessary rods shall be provided

(h) The rates quoted shall be inclusive of manufacture, supply and installation at Site, and inclusive of all the necessary accessories rubber strips, locks, rods, taxes, octroi, transport, labour charges, insurance, storage and safe custody, etc. complete.

(i) The rates shall also be inclusive of providing and applying with gun neutral grade silicon sealant of specified thickness ,width ,make & color and making the joints around aluminium doors, windows etc. watertight, on the external periphery of the building at the junction of two different materials as directed by the Engineer-in-charge.

The Contractor shall have to give a guarantee bond, for water tightness, on appropriate Stamp paper for a period of 5 years. In this period he shall attend to and rectify all complaints without causing any inconvenience to the Institute. The form of Guarantee Bond shall be as prescribed below :

"I/We ..... (Contractor) hereby guarantee that work shall remain unaffected and shall not be in any way damaged by atmospheric conditions, for a period of **5 years** after the completion of the work of applying sealant and making the joints around aluminium doors watertight, on the external periphery of the building at the junction of two different materials as per the terms and conditions of the Contract and guarantees to redo the affected work without claiming any extra cost."

(j) Necessary provision for rain water disposal shall be done in the bottom guides/frames as directed and approved by Engineer-in-charge.

(k) Offer must be in accordance with detailed drawings with dimensions of aluminium sections in frames and shutters as shown in drawing. It shall be accompanied by the detailed drawing if any deviation is proposed.

(l) The quantities are provisional and may vary to any extent. No claim will be entertained on this account for any reason.

(m) Work shall be carried out in co-operation and in coordination with all other agencies working at Site.

(n) The civil work as required for fixing of floor springs & making it good on completion hold fast or other works required for the erection and completion of doors/windows etc. shall be done by the Contractor without any extra cost.

(o) Any damage, if caused to the existing work done by other agencies, shall be reinstated by the Contractor to its original condition without any extra cost.

(p) During the course of work, the Contractor shall pay due care to avoid any stains on the powder coating work and if required, the Contractors shall provide necessary protective arrangement as directed by the Engineer-in-charge for which no extra payments shall be made. After the installation is completed, if required by the Engineer-in-charge, the aluminium work shall be washed with mild solution of non alkali soap and water.

(q) The Contractor shall be responsible for the windows/doors/grills etc. being set straight, in plumb level and for their satisfactory operations after the fixing is completed.

(r) Wherever required and as directed strengthening of members shall be done by providing steel / M.S. concealed members without extra cost.

2.1.1 ALUMINIUM

2.1.1.1 Aluminium Sections

Aluminium sections used for fixed/openable windows, ventilators, partitions, frame work & doors etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Engineer-in-Charge for technical, structural, functional and visual considerations. The aluminium extruded sections shall conform to IS 733 and IS 1285 for chemical composition and mechanical properties. The stainless steel screws shall be of grade AISI 304.

The permissible dimensional tolerances of the extruded sections shall be as per IS 6477 and shall be such as not to impair the proper and smooth functioning/operation and appearance of door and windows.

Aluminium glazed doors, windows etc. shall be of sizes, sections and details as shown in the drawings. The details shown in the drawings may be varied slightly to suit the standards adopted by the manufacturers of the aluminium work, with the approval of Engineer-in-Charge. Before proceeding with any fabrication work, the contractor shall prepare and submit, complete fabrication and installation drawings for each type of glazing doors, windows, ventilators and partition etc. for the approval of the Engineer-in-Charge. If the sections are varied, the contractor shall obtain prior approval of Engineer-in-Charge and nothing extra shall be paid on this account.

2.1.1.2 Anodising

Standard aluminium extrusion sections are manufactured in various sizes and shapes in wide range of solid and hollow profiles with different functional shapes for architectural, structural glazing, curtain walls, doors, window & ventilators and various other purposes. The anodizing of these products is required to be done before the fabrication work by anodizing/electro coating plants which ensures uniform coating in uniform colour and shades. The extrusions are anodized up to 20 micron in different colours. The anodized extrusions are tested regularly under strict quality control adhering to Indian Standard.

2.1.1.3 Powder Coating

2.1.1.3.1 Material: The powder used for powder coating shall be Epoxy/polyester powder of make approved by the Engineer-in-Charge. The contractor shall give detailed programme for powder coating in advance, to facilitate the inspection by Engineer-in-Charge or his authorized representative.

2.1.1.3.2 Pre-treatment: Each aluminium alloy extrusion or performed section shall be thoroughly cleaned by alkaline or acidic solutions under the conditions specified by chemical conversion coating supplier and then rinsed. A chemical conversion coating shall be applied by treatment with a solution containing essentially chromate ions or chromate and phosphate ions as the active

components as applicable. The amount of the conversion coating deposited depends on the type used by the conversion coating chemical supplier. The conversion coating shall be thoroughly rinsed either with the solution specified by the conversion coating chemical supplier or with de-mineralized water and then dried at the temperature for the time specified by the conversion coating chemical supplier. The contractor shall submit the detail specifications and application procedure for application of conversion coating for approval of Engineer-in-Charge. The metal surface after the conversion coating pretreatment and prior to the application of the coating shall be free from dust or powdery deposits.

2.1.1.3.3 Process: The polyester powder shall be applied by electrostatic powder spray method. Before start of powder coating the contractor shall submit detail specification for application of polyester powder from manufacturer of the polyester powder for approval of Engineer-in-Charge. The powder coating shall be applied as per the specification approved by Engineer-in-Charge.

2.1.1.3.4 Thickness: The thickness of the finished polyester powder coating measured by micron meter shall not be less than 50 micron nor more than 120 micron at any point.

2.1.1.3.5 Performance Requirements for the Finish

(i) Surface appearance: The finish on significant surfaces shall show no scratches when illuminated and is examined at an oblique angle, no blisters, craters; pinholes or scratches shall be visible from a distance of about 1 m. There shall not be any visible variation in the colour of finished surfaces of different sections and between the colours of different surfaces of same section.

(ii) Adhesion: When a coated test piece is tested using a spacing of 2 mm between each of the six parallel cuts (the cut is made through the full depth of powder coating so that metal surface is visible) and a piece of adhesive tape, approximately 25 mm x 150 mm approved by the Engineer-in-Charge is applied firmly to the cut area and then removed rapidly by pulling at right angles to the test area, no pieces of the finish other than debris from the cutting operation shall be removed from the surface of the finish.

2.1.1.3.6 Protection of Powder Coated / Anodizing Finish : It is mandatory that all aluminium members shall be wrapped with self adhesive non-staining PVC tape, approved by Engineer-in-Charge.

3.0 Mode of Measurements and Payment

Measurement: All the aluminium sections including snap beading fixed in place shall be measured in running meter along the outer periphery of composite section correct to a millimeter. The weight calculated on the basis of actual average (average of five samples) weight of composite section in kilogram correct to the second place of decimal shall be taken for payment. (Weight shall be taken after anodizing). The weight of cleat shall be added for payment. Neither any deduction nor anything extra shall be paid for skew cuts.

Rate: The rate shall include the cost of all the materials, labours involved in all the operations as described in nomenclature of item and particular specification.

The rate shall be for a unit o f one kg.

Item-49 Providing and Constructing Inspection Chamber, of clear size 900x900x1200 mm depth, as shown and mentioned in the drawings, curing, scaffolding, all as per followings, # Excavation including back filling and disposing of surplus excavated earth of size 1.70 Mt x 1.70 Mt

 # P/ Laying 150 mm thick Plain Cement Concrete in CC 1: 4: 8 for foundation trenches, flooring and haunching of size 1.70 Mt x 1.70 Mt
 # Providing and Constructing Brick masonry in CM 1:5 in foundation 230 mm thick.
 # P/ Laying (P/L) 150 mm thick Reinforced Cement Concrete in CC 1: 2: 4 for slab and coping at Ground level.
 # P/L centering and shuttering for RCC.
 # P/Fabricating/laying high yield strength deformed bars 8 mm dia 100 mm c/c both ways including extra at cover.
 # P/L 12 mm thick Water proof plaster in CM 1:3 inside, outside and top exposed surface, internal bottom, chamfering etc.
 # P/Fixing Cast iron covers with frame of size 600x600 mm having 75 Kg wight in CM 1:3.
 # P/Laying proper inlet and outlet connection.
Including all as per detailed specifications and as per directed by Engineer-in-charge.

1.0 Materials :

1.1 Water shall conform to M-1. Cement shall conform to M-3. Brick shall conform to M-15. Stone aggregate shall conform to M-12. Sand shall conform to M-6. TMT bar shall conform to M-19B. C.I. cover shall be of 600 mm. x 600 mm. internal dimension having 75 Kg. weight of the cover and frame. The cover shall be free from any defects. The cover shall conform to IS : 1726. The cover shall be of best foundry grey metal, tough and close grained. The sample of the cover shall be got approved from Engineer-in-charge.

2.0 Workmanship :

2.1 The excavation shall be done true to dimensions and levels shown on the plans or as directed and relevant specification of item no. 1.00 of Excavation, shall be followed.

2.2 Bed concrete shall be 15 cm. thick, in C.C. 1:4:8 (1 cement : 4 coarse sand : 8 graded brick bat aggregates). The projection of bed concrete beyond the masonry walls shall be 15 cm. and relevant specification of item no. 10 shall be followed.

2.3 Masonry work and plaster work shall be carried out as per relevant specifications of item 7 and 25 shall be followed same except proportion as specified in items respectively. Water proofing Plastering work shall be carried out in C.M. 1:3, inside and outside, in 15 mm. thickness and finished smooth with cement slurry. The back filling shall be carried out only after approval of the Engineer-in-charge.

2.4 The cover and frame shall be fitted in best workman-like manner and shall be set to correct alignment and level, embedded in layers of 1:3 C.M above 150 mm thick Reinforced Cement Concrete in CC 1: 2: 4 for coping., to the satisfaction of the Engineer-in-charge and Architect. The cover and frame shall be painted with 2 coats of anti-corrosive black bitumastic paint.

2.5 The floors shall be of C.C. and the side walls of brickwork or rubble masonry as laid down in the drawings and proper channels, shall be formed across them to lead the storm water/sewage from the pipe drain to the other without interruption to the flow and all pipes required for branch pipe drain connections shall be built in the walls, as directed by the Engineer-in-charge. Relieving arches shall be provided to prevent any load on the pipes.

2.6 The C.I. steps shall be fixed as and where directed and making the surface good as original.

2.7 C.I. inspection chamber with provision of C.I. bends of specified size with bolts, nuts and left washers for under ground drain shall be enclosed in masonry chamber which shall be constructed as above.

3.0 Mode of Measurements and Payment :

3.1 The rate include all materials, labour and equipments required for satisfactory completion of item as specified.

3.2 The rate shall be for an unit of one number.

SECTION – 8 – SCHEDULE OF CONSTRUCTION WORK

Sr. No.	Item Description	1				2				3				4				Remarks
		1-W	2-W	3-W	4-W	5-W	6-W	7-W	8-W	9-W	10-W	11-W	12-W	13-W	14-W	15-W	16-W	
1	Aluminum decorative fencing and partition work at second floor of New building.																	
2	Repainting of General area (corridors, common toilets, dining, kitchen, conference room etc) at Guest house.																	
3	Construction of transformer foundation and alied works near RF laboratory for Aditya group																	
4	Civil work for Construction of Cricket pitch at back side of Helium tank yard.																	
5	Railing at Hostel block H1, H2, H3, Student facility building, Married student hostel and guest house.																	
6	Filling of Metal inside 132 Kv sub-staion.																	

Sr. No.	Item Description	1				2				3				4				Remarks
		1-W	2-W	3-W	4-W	5-W	6-W	7-W	8-W	9-W	10-W	11-W	12-W	13-W	14-W	15-W	16-W	
7	Rain water drain at backside of seminar hall and other miscellaneous civil work.																	