



**URANIUM CORPORATION OF INDIA LIMITED**  
**(A Government of India Enterprise)**  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

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**NIT No.**  
**TMD / 623**

## **TENDER DOCUMENT**

**OF**

**N. I. T No. –TMD / 623**

**Construction of MCC building, control room, foundations for  
Crane, Mill and other structures for Magnetite By-Product  
recovery plant in Mill area at Turamdih**



**URANIUM CORPORATION OF INDIA LIMITED**  
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**TURAMDIH MILL**

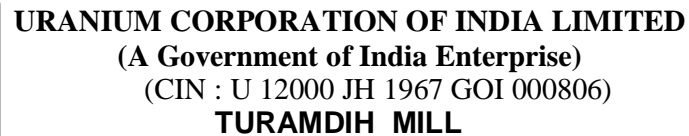
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**NIT No.**  
**TMD / 623**

**NIT No : TMD / 623**

**Part – I**

**Technical Part**



**N. I. T. No. TMD / 623**

FOR

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URANIUM CORPORATION OF INDIA LIMITED  
(A Government of India Enterprise)  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

**NIT No.  
TMD / 623**

**N. I. T. No. TMD / 623**

Construction of MCC building, control room, foundations for Crane, Mill and other structures for Magnetite By-Product recovery plant in Mill area at Turamdih

**SPECIAL INSTRUCTIONS TO THE TENDERERS**

1. One set of Tender document ( Technical & Price part ) are here with .**Tenderers are requested to submit 02 sets of Technical part complete in all respect, in a separate sealed envelope and 03 sets of Price part (original along with Xerox of original) in separate sealed envelop** super scribing Technical / price part N. I. T No. Name of work, Name of Tenderer and date of opening of tender as advertised/notified.
2. E. M. D will be submitted in a **separate sealed envelope**.
3. Instrument of Cost of Tender Document will be submitted in **separate sealed Envelope**.
4. All the above **04 ( Four )** sealed envelopes ( 02 sets of Tech. part , EMD, Cost of Tender and 03 sets of Price part) shall be kept in separate main sealed envelope which shall also be super scribed with NIT No. with the details as mentioned above in serial number.
6. All the pages of tender document including price part should be duly signed along with seal of tenderer without which tenders are likely to be rejected.
7. This tender document( Tech Part ) **contains 149 pages**. In case of any of the document found missing, tender is likely to be rejected.



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**URANIUM CORPORATION OF INDIA LIMITED**  
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**NIT No.**  
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## **SECTION – I**

# **NOTICE INVITING TENDER**



**URANIUM CORPORATION OF INDIA LIMITED**  
**(A Government of India Enterprise)**  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

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**NIT No.**  
**TMD / 623**

## **CONTENTS**

1. NIT No. – TMD / 623
2. Detailed Notice Inviting Tender



**URANIUM CORPORATION OF INDIA LIMITED**  
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 (CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

**NIT No.**  
**TMD / 623**

**URANIUM CORPORATION OF INDIA LIMITED**  
**(A Govt. Of India Enterprise)**  
**Turamdih Mill , PO.-Sundernagar**  
**East Singhbhum, PIN – 832 107**

**Phone No. 0657 - 6451148/2318001/2/3/4**  
**Ext: 7457 /7459**  
**Fax No. 0657 - 2318009**

UCIL/TMD/MILL-CIV/ 2014

December 25, 2014

**NOTICE INVITING TENDER No- TMD / 623**

Sealed item rate limited tenders are invited from the experienced local contractors for the following work. Price part to be submitted in triplicate (One original plus two sets Xerox there of) .

Name of work	Cost of Tender document	Period of completion	Estimated value of work	Earnest Money Deposit	Last Date of submission of Tender (Tech.+ Price part)	Date of opening of tender (Techno-Commercial Part)
<b>Construction of MCC building, control room, foundations for Crane, Mill and other structures for Magnetite By – Product recovery plant in Mill area at Turamdih</b>	<b>Rs 5,000/-</b>	<b>12 (Twelve ) Months</b>	<b>Rs 1.75 Crores Approx</b>	<b>Rs. 1.75 lakhs</b>	<b>20.01.2015 up to 3-.00 P.M.</b>	<b>20.01.2015 at 3.30 P.M.</b>
<i>If office of UCIL Turamdih happens to be closed on the last date and time mentioned for any of the above events, the said event will take place on the next working day at the same time and venue.</i>						

Full details, terms, conditions and specifications of works as well as detailed conditions of tendering shall be available in the above-mentioned NIT document, which can be downloaded from UCIL's web site [www.ucil.gov.in](http://www.ucil.gov.in) from **30.12.2014 onwards. Telex, telegraphic, postal or e-mail bids will not be entertained. Tenders received without Earnest Money Deposit, , Service Tax Code PAN. and cost of tender will be summarily rejected .**

The corporation reserves the right to accept or reject any or all tenders either in full or part thereof or to split up the work, if necessary without assigning any reasons whatsoever.

For Chairman & Managing Director  
 Uranium Corporation of India Limited





URANIUM CORPORATION OF INDIA LIMITED  
(A Government of India Enterprise)  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

**NIT No.  
TMD / 623**

### **DETAILED NOTICE INVITING TENDER**

Sealed item Rate Contract tenders are invited on behalf of the Chairman and Managing Director, Uranium Corporation of India Limited, Jaduguda for the work **“Construction of MCC building, control room, foundations for Crane, Mill and other structures for Magnetite By – Product recovery plant in Mill area at Turamdih**

1. The Tender shall be in prescribed form and it shall be valid for a minimum period of **six** months from the date of opening of Tender. Should the Tenderer modify or withdraw his tender within the said period of six months from the date of opening the Tender, Earnest Money deposited by the Tenderer shall be forfeited and no tenders will be issued further to such tenderer.
2. The works are required to be completed within 12 (**Twelve**) **months** from the date of commencement which the engineer-in-charge issues by written orders to commence the work as per LOI/Work order, in accordance with the phasing, if any, indicated by the Corporation in the Tender documents.
3. Normally Contractor whose names are borne on the approval list of Contractor of C.P. W. D / M. E. S or local reputed/experienced Contractors will be permitted to Tender. Not more than one Tender shall be submitted by a firm of Contractors against the same N. I. T.
4. Chairman & Managing Director, UCIL shall be the Accepting Officer hereinafter referred to as such for the purpose of this Contract.
5. **Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their Tenders as to the nature of the ground and sub soil as far as is practicable) the form and nature of the site, the means of access to the site the accommodation they may require and general shall themselves obtain all necessary information as to risks, contingencies and circumstances which may influence of effect their Tender. A Tenderer shall be deemed to have full knowledge of the site whether he inspect it or not and no extra changes consequent on any misunderstanding or otherwise shall be allowed.**
6. Submission of a Tender by a Tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of considerations and rates at which stores, tools and plants etc will be issued to him by the corporation and local conditions and other factors bearing on the execution of the work.
7. A Tenderer should quote the rate (s) tendered in figures as well as in words. The amount for each item should be worked out and the requisite totals given. Special care shall be taken to write rates in figures as well as words and the **rates in words only** in such a way shall be considered for calculation of quoted value. Writing the amount in words against each item is not required..
8. All rates shall be quoted on the Tender form.



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9. In the case of item rate Tenders, only rates quoted shall be standard considered. Any Tender containing percentage below/above any scheduled rates quoted is liable to be rejected.
10. The Tender for the works shall not be witnessed by a Contractor or Contractors who himself / themselves has / have tendered or who may and has/ have tendered for the same works. Failure to observe this condition shall render the Tender of the contractor tendering as well as of those witnessing the tender liable to be rejection.
- 11. Tender shall be received in Tender box at the office of Dy. Manager (Pers), Turamdih upto 3.00 PM on or before 20.01/2015 and shall be opened at 3.30 PM on 20.01.2015 in the presence of Tenderers who may be present.**
12. The Tender shall be accompanied by Earnest Money as stipulated in NIT and in the mode of payment as contained in Para (9) of General conditions of Contract. Even working Contractor shall not be exempted from payment of Earnest Money Deposit.
13. On acceptance of tender, Earnest Money will be treated as part of the security deposit. Failure of the successful tenderer to carry out the tender work shall entail forfeiture of the earnest money and security deposit entirely.
14. Uranium Corporation of India Limited, Turamdih will return the Earnest Money without any interest, to unsuccessful Tenderers on production by the Tenderer of a certificate of Engineer-in-charge. Cost of tender is not returnable in any case.
15. The Tenderer shall submit the Tender which satisfied each and every condition laid down in this notice, failing which the Tender will be liable to be rejected.
16. The Corporation does not bind themselves to accept the lowest or any tender or to give any reasons for their decision.
17. The corporation reserve to themselves the right of accepting the whole or any part of the Tender and Tenderer shall be bound to perform the same at quoted rates.
18. Sales Tax or any other tax on materials in respect of this contract shall be payable by the Contractor and the Corporation will not entertain any claim whatsoever in this respect.
19. This notice of Tender shall form a part of the Contract documents.



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## **SECTION - II**

## **GENERAL INFORMATION**

## GENERAL INFORMATION

- |         |  |   |  |
|---------|--|---|--|
| 1.00.00 | <b>Project</b>   | : | Uranium Ore Mining & Processing Project  |
| 2.00.00 | <b>Executing Agency</b>  | : | Uranium Corporation of India Limited<br>(A Govt. of India Enterprise)<br>P.O.-Jaduguda Mines<br>Dist. Singhbhum (East)<br>Jharkhand – 832 102  |
| 3.00.00 | <b>Project Site</b>  | : | Turamdih   |
| 4.00.00 | <b>Site</b>  | : | Talsa  |
| 4.01.00 | <b>Location</b>  | : | Latitude        -    22° 43’ N<br>Longitude       -    86° 16’ E   |
| 4.02.00 | <b>Rail &amp; Road Connection</b>  |   |  |
|         |  |   | The nearest railway station is Tatanagar about 6 Kms. North of the site and is connected to Tatanagar – Hata – Chaibasa Road.  |
| 4.03.00 | <b>General Topography</b>  |   |  |
|         |  |   | The site is undulating with a small hill near the centre of the site. There are also a few mounds and ponds in the area. The site for tailing disposal is a valley south of the area. The natural drainage of the area is towards west and north west. The grade level of the area is between 155 m and 190 m above M.S.L. |
| 4.04.00 | <b>Climatic Condition</b>  |   |  |
|         | i) Peak ambient temperature  | : | 47 °C  |
|         | ii) Lowest ambient temperature   | : | 4 °C   |
|         | iii) Average daily max. temperature in the hottest month May and June      | : | 40 °C  |
|         | iv) Average daily min. temperature in the coldest month December & January | : | 11 °C  |
|         | v) Annual Average rainfall   | : | 1400 mm  |
|         | vi) Highest annual rainfall  | : | 1860 mm  |



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	vii)	Heaviest rainfall in 24 hours	:	290 mm
	viii)	Max. relative humidity	:	100 %
	ix)	Prevalent direction of wind from	:	West
4.05.00	<b>Seismic Condition</b>	:	Zone II as per IS : 1893	
4.06.00	<b>Max. highest flood level</b>	:	140 m above MSL.	



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## **SECTION – III**

## **CONDITIONS OF TENDERING**



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## **I N D E X**

1.00.00	:	PREPARATION OF TENDERS
2.00.00	:	SUBMISSION OF TENDER
3.00.00	:	QUALIFICATION OF TENDERERS
4.00.00	:	VALIDITY OF TENDER
5.00.00	:	EARNEST MONEY
6.00.00	:	AWARD OF CONTRACT
7.00.00	:	TIME FOR COMPLETION
8.00.00	:	OPENING OF TENDERS
9.00.00	:	DRAWINGS
10.00.00	:	SECRECY



### **SECTION - III**

#### **CONDITIONS OF TENDERING**

#### **1.00.00 PREPARATION OF TENDERS**

##### **1.01.00 Tenderer to Study**

1.01.01 Before submission of the tender the Tenderers are requested to make themselves fully conversant with the Conditions of Tendering, General Conditions, Special Conditions, Site Conditions, Specifications, Schedules, Drawings and all other relevant information so that no ambiguity may arise in these respects subsequent to the submission of the tender.

1.01.02 It shall be the responsibility of the Tenderer to request for any missing document. In absence of any such request the Tenderer will be deemed to have received and read all documents.

1.01.03 The Tenderer shall submit his tender strictly in accordance with the tender specification and terms and conditions laid down in the tender document.

Should there be any discrepancy in, or any doubt, or obscurity, to the meaning of any of the clauses of the tender document, or as to anything to be done or not to be done by the accepted Tenderer or as to these instructions observed by the intending Tenderer, the Tenderer must set forth in writing such discrepancy, doubt or obscurity, and submit the same in duplicate to the Purchaser (Attn.: Sri S. N. Prasad DGM.(Civil) UCIL, Turamdih) so as to reach them as soon as possible. The elucidation given by the Purchaser shall be final and binding on the Tenderers.

1.01.06 The tenders shall contain firm prices for the work till completion of the work in all respect. No escalation whatsoever will be paid or entertained.

1.01.07 A set of technical description and illustrative literature must accompany each copy of the tender explaining clearly and definitely the equipment offered.

##### **1.02.00 Language**

English shall be the ruling language. All tenders, drawings, technical data, document and / or correspondence shall be in English.

##### **1.03.00 Canvassing Prohibited**

Canvassing in any form is strictly prohibited and any Tenderer found to have resorted to canvassing shall be liable to have his tender rejected summarily.





1.04.00      **Misinformation**

If the Tenderer deliberately gives wrong information in his tender to create circumstances for the acceptance of his tender, the purchaser reserves the right to reject such tender.

1.05.00      **Documents not Transferable**

Tender documents are not transferable.

1.06.00      **Not more than one Tender**

Not more than one tender for a work shall be submitted by one Contractor or one Firm of contractors.

1.07.00      **Tender Document Property of the Purchaser**

Tender documents in which tender are submitted by a Tenderer shall become the property of the Purchaser and the Purchaser shall have no obligation to return the same to the Tenderer.

1.08.00      **Tenderer to bear Expenses**

The Purchaser shall not be liable for any expenses what so ever incurred by the Tenderer in the preparation of the tender whether his tender is accepted or not even if the purchaser opts for complete withdrawal of invitation of Tender.

2.00.00      **SUBMISSION OF TENDER**

2.01.00      Tenders to be in two parts.

2.01.01      Unless otherwise instructed to the contrary all tenders shall be submitted in two parts i.e., (i) Part – I : Techno commercial and (ii) Part – II : Price.

2.01.02      **List of Documents to be submitted in Part - I**

- a)      Tenderer's covering letter.
- b)      Document showing deposit of **Earnest money**
- c)      **cost of tender document**
- d)      Signed NIT tender document
- e)      Copy of PAN



- f)) E. P.F. No with documentary proof
- g) Service Tax Code No. with documentary proof
- i) Profit & Loss A/c statement of last 03 yrs and audited balance sheet
- j) Full statement along with documentary proof in support of past experience of the Tenderer in similar nature of job along with Work order & completion Certificates.
- k) List of construction equipment / workshop / manufacturing / testing facilities available for this contract along with their present conditions / location.
- l ) Certificate / proof of registration of the Firm / Company with registrar of Firm / Company has to be submitted
- m) List of Technical & supervisory staff.
- n) Other document as may be required to be submitted along with the tender in accordance with Technical Specification, Special Conditions and General Conditions of NIT Tender Document.

**2.01.03 List of Documents to be submitted in Part-II**

- a) Tenderer's covering letter.
- b) Filled in Schedule of quantities in triplicate (one original plus two xerox thereof)

**2.02.00 NIT Tender Document to be signed and returned**

All tender papers shall be signed and returned with the first copy of tender under Part-I, and confirmation of the same in balance copies.

All pages of tender papers, drawings and documents shall be initialed at the lower right hand corner with ink only and signed where required by the Tenderer or any person holding Power of Attorney authorizing him to sign on behalf of Tenderer.

**2.03.00 Number of copies of Tender**

The tender shall be submitted as mentioned in special instruction to the tenderers each self contained complete in all respects, except that NIT document to be



signed and returned only with the first copy and confirmation regarding enclosure to be made in other copies.

**2.04.00 Tenders to be Unambiguous**

No alteration in the form of the tender or in the amount or any addition in the form of special stipulation will be permitted. If corrections be needed while filling in the tender, the same shall be made by the Tenderer with his dated signature. **Tender which is incomplete, obscure or irregular or only for a part of the package / schedule is liable to rejection.**

**2.05.00 All pages to be signed**

All pages of the Tenderer's offer drawings and other accompanying documents shall be initialed at the lower right hand corner with ink only and signed where required by the Tenderer or any person holding Power of Attorney authorizing him to sign on behalf of the Tenderer before submission of the tender. All signatures shall be dated.

**2.06.00 Tenderer's Identity**

The tender shall contain the **name, residence and place of business of person or persons submitting the tender.**

**2.07.00 Authorization**

In the event of the tender being submitted by a firm, it must be signed by each partner thereof, and in the event of the absence of any partner, it shall be signed on his behalf by a person holding a Power of Attorney authorizing him to do so, **certified copy of which shall be enclosed.**

Tenders submitted on behalf of companies registered under the Indian Companies Act, for the time being in force, shall be signed by persons duly authorized to submit the tender on behalf of the company and shall be accompanied by certified copies of the resolutions, extracts of articles of association, special or general Power of Attorney and other information to show clearly the title, authority and designation of persons signing the tender on behalf of the company.

In the event of the tender being submitted by Indian agent on behalf of his foreign principal, in addition to above document, the letter or agreement of authorization clearly indicating the status extent and validity of authorization from foreign principal shall be submitted along with the tender. A confirmation in the form of



division of responsibility covering the various activities required to be undertaken for execution of the contract shall be enclosed.

**2.08.00 Delivery of Tender**

2.08.01 The completed tender with all its accompaniments shall be submitted.

2.08.02 All the two (2) sets of Part – I: Technical (including the Purchaser's NIT tender document signed as per Clause 2.02.00 above and enclosed with the first copy), shall be enclosed in a sealed envelope which shall be super scribed the Tender Notice Number, name of work for which tender is submitted, name of Tenderer and date of opening as advertised / notified along with the inscription Part – I: Techno-commercial part

2.08.03 All the three (3) sets of Part – II: Price shall be enclosed in a separate securely sealed envelope which shall be similarly super scribed but shall have the inscription Part II: Price.

2.08.04 Earnest Money Deposit (E. M. D) will be submitted in a sealed envelope.

2.08.05 Instrument of cost of Tender document will be submitted in separate sealed envelop.

2.08.06 All the above 04 sealed envelope shall be kept in separate main sealed envelope which shall also be super scribed with NIT No. with the details as mentioned above in serial number and so delivered to the office of Asstt Mgr. ( Pers. ) unless otherwise instructed to the contrary to reach him on or before the date and hour fixed for receiving the tender.

2.08.07 Personal delivery is recommended.

**3.00.00 QUALIFICATION OF TENDERERS**

3.01.00 Evaluation will be done based on the documents submitted by the tenderers. No correspondence shall be made after opening of technical part regarding any missing document.

Only such firms need tender who can produce satisfactory evidence that they have the necessary experience & financial resources and organization to undertake such work as per criteria mentioned below.

i) The tenderer's average annual turnover during last 03 years, ending 31<sup>st</sup> March of the previous financial year should be at least 52.5 Lakhs.

i) Experience of having successfully completed similar works during last 07 years ending last day of month previous to the one in which application are invited should be either of the following:



- a) One similar completed works each costing not less than the amount equal to 140 Lakhs.
  - or
  - b) Two similar completed works each costing not less than the amount equal to 87.5 Lakhs.
  - or
  - c) Three similar completed works each costing not less than the amount equal to 70 Lakhs.
- ii) **Similar work means experience in executing Civil Construction work .**

**b). The contractor will have to submit attested copy of the work order as well as the completion certificate from the concern department in support of their experience/ credential.**

The above are bare minimum criteria. In case of non fulfillment of any of the above tender may not be considered technically qualified.

- 3.02.00 In case of the tender is limited to short listed/pre-qualified Tenderers, the latest position of experience (list of projects/order, scope, value of work, status), present commitments (list of projects/order, location, value of order, percent completed, date of start, expected date of completion etc.), list of construction machineries, workshop and testing facilities and key technical personnel available with the Tenderer along with list of such items which are likely to be deployed at site for this work, in case the Tenderer is successful and financial resources shall be enclosed with the tender. Apart from this, he has to furnish balance sheet, profit & loss account for the last 3 years, name & qualification of the key personnel to be deployed for this contract.
- 3.03.00 In case of two parts tender the submission of tender document will not automatically mean that such tenders are considered qualified. The assessment will be done based on the information furnished and submitted by the Tenderer along with tender.
- 3.04.00 The Tenderer shall furnish with the tender the documents mentioned in Clause 2.01.02:  
No Tenderers shall be considered technically qualified unless they submit the relevant documents..



3.05.00      **Notwithstanding any pretender check on qualification the Purchaser reserves the right to undertake any post tender evaluation of qualification of Tenderers as he deems necessary.**

3.06.00      **The above stated requirements are minimum. Notwithstanding anything stated above, Purchaser reserves the right to assess the Tenderer's capability to perform the Contract should the circumstances warrant such an assessment in the overall interest of Purchaser. Purchaser reserves the right to reject the proposal of any Tenderer if, in the opinion of Purchaser the qualification data is incomplete or the Tenderer is found to not qualify to satisfactorily perform work as tendered for.**

4.00.00      **VALIDITY OF TENDER**

The tender submitted shall be deemed to constitute an agreement between the Tenderer and the Purchaser whereby such tender shall remain open for acceptance by the Purchaser for a period of six (6) months from the date the tenders are opened, during which period the Tenderer shall not withdraw his offer or amend, impair or derogate there from. If the tender submitted does not contain all the relevant information the purchaser may ask them to provide or reject the offer as circumstances arise. Clarification as required by the purchaser on the information furnished by the Tenderer in the tender, the Tenderer is requested to supplement the information or submit clarification. The aforesaid validity period of six (6) months shall be deemed to commence from the date of receipt of the information and clarification called for. Every Tenderer is therefore requested to furnish all the relevant information to make the tender complete so as to avoid undue delay in finalizing the offer.

Every Tenderer shall be deemed to have agreed as aforesaid in consideration of the tender being considered by the Purchaser in terms hereof, provided the same has been duly submitted and found to be in order. If the Tenderer be notified in writing at the address given in the tender within the said period of six (6) months that his tender has been accepted, he shall be bound by the terms of agreement constituted by his tender and such acceptance thereof by the Purchaser until a written contract has been executed in place of such agreement.

The Tenderer whose tender has been accepted and so notified shall become the "Successful Tenderer".

5.00.00      **EARNEST MONEY/ Cost of tender**

5.01.00      Earnest Money /cost of tender as per Notice Inviting Tender shall be deposited unless otherwise instructed to the contrary in any of the following ways and must



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accompany the tender document without which the tender will not be considered at all.

i) Cost of tender document.

In properly executed Bank Drafts of Rs 5,000/- ( Rs. Five thousand only) drawn in favour of Uranium Corporation of India Limited payable at Jaduguda/Jamshedpur for cost of tender document.

ii) EMD

DD/TDR/ FDR/ Properly executed Bank Guarantee issued by SBI, Jaduguda/ Hartopa or Punjab National Bank, Jamshedpur.or from any Indian Nationalized Bank of schedule banks .Bank Guarantee obtained from any Indian nationalized bank of schedule banks to be jointly, severally bound with the Contractor to the purchaser for the amount same above. The terms of the said guarantee shall be such as shall be approved by the purchaser and the obtaining of such guarantee and the cost of guarantee to be so entered shall be at the expenses, in all respects, of the Contractor. The Bank Guarantee shall remain valid for six (6) months from the date of opening of Tender with a claim period of three (3) months.

No cash or cheque in any form will be accepted. No interest will be paid on any earnest money or any guarantee.

5.02.00 The earnest money of unsuccessful Tenderers will be returned after award of the contract to successful Tenderer.

6.00.0 0 **AWARD OF CONTRACT**

The acceptance of a tender and award of contract to one or more than one Tenderer, if considered necessary, rests with the Purchaser. Purchaser has the right to re group the packages under the Tender. It shall not be obligatory on the part of the Purchaser to accept the lowest tender. The Purchaser would be at liberty to accept any tender, lowest or otherwise, in whole or in part and to reject any or all the tenders received, without assigning any reason, and no explanation and compensation can be demanded of him by any Tenderer in respect thereto.

7.00.00 **TIME FOR COMPLETION**

Twelve (12) months from the date as stipulated in LOI/ Work order.



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8.00.00      **OPENING OF TENDERS**

Tenders will be opened at the place notified on the appointed date and time in presence of Tenderer's authorized representatives who are present. Not more than two (2) representatives of each Tenderer shall be permitted to attend the opening of the tenders.

9.00.00      **DRAWINGS**

Each Tenderer shall forward in connection with his Tender, Drawings (a complete set with each copy of the Tender) and the Drawings shall be duly marked so as to connect them with the Tender to the satisfaction of the Purchaser and shall be deposited by the Tenderer with his Tender. All drawings forwarded as part of the Tender whether so required by any reference in the specifications shall remain the property of the Purchaser.

10.00.0      **SECRECY**

The Tenderer (whether his Tender is accepted or not) shall treat the details of the Tender Specifications and other documents attached thereto, as private and confidential. The Tenderer shall take necessary steps to ensure that all persons employed in any work in connection with his tender have noticed that the Indian Official Secret Act 1923 (XIX of 1923) and Indian Atomic Energy Act 1962 (XXXIII of 1962) amended thereafter applied to them and shall continue so to apply even after award of the Contract (Whether his Tender is accepted or not).





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## **SECTION – IV**

## **FORMS**



**URANIUM CORPORATION OF INDIA LIMITED**  
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## **I N D E X**

- 1.00.00 : FORM OF TENDER
- 2.00.00 : ARTICLES OF AGREEMENT
- 3.00.00 : BANK GUARANTEE FOR EARNEST MONEY
- 4.00.00 : BANK GUARANTEE FOR SECURITY DEPOSITE
- 5.00.00 : Schedules B , C , D, F



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**FORM OF TENDER**

To  
The Chairman & Managing Director,  
M/s. Uranium Corporation of India Limited,  
P.O: Jaduguda Mines  
Dist: Singhbhum (East)  
Jharkhand – 832102

Dear Sir,

I/We, the undersigned hereby submit, the tender document for the work as above and hereby under take to execute the complete works as set forth in the scope of work, Technical Specifications, Tender Drawings in accordance with the conditions of tendering, special conditions of contract, general conditions of contract or in default thereof to forfeit any pay to Uranium Corporation of India Limited, the sum of money mentioned in relevant Tender Documents.

I/We agreed to abide by this tender for the period of \_\_\_\_\_ months from the date fixed for the opening of the same and in default agree that the amount of Earnest Money along with this tender may be forfeited.

I/We undertake to complete whole works covered under this tender within a period of \_\_\_\_\_ months from the date of Letter of Acceptance.

I/We have deposited as the Earnest Money a sum of Rs. \_\_\_\_\_ in shape of \_\_\_\_\_ which amount is not to bear any interest and I/We do hereby agree that this sum shall be forfeited by Uranium Corporation of India Limited in the event of accepting my/our tender I/We fail to execute the Contract when called upon to do so.

If this tender is accepted, I/We shall deposit the sum to constitute the security deposit required by the relevant terms of the contract.

I/We also undertake, as required to enter into a contract with Uranium Corporation of India Limited by executing an Agreement in the prescribed Contract Agreement from enclosed along with this tender document and till such time the Agreement be not executed, we shall be bound by the terms and conditions of the tender document and subsequent letter, minutes of discussions and letter of acceptance.

	(Signature of Tenderer with seal)
	Name:
	Address of the firm:



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	Dated	day of 200
--	-------	------------

**ARTICLES OF AGREEMENT**

ARTICLES OF AGREEMENT made and entered into this -----day of ----- TWO THOUSAND \_\_\_\_ at Jaduguda between M/s Uranium Corporation of India Limited ( A Government of India Enterprise) having it's Registered office at Jaduguda Mines, Dist. East Singhbhum, Jharkhand – 832 102 (herein after referred to as the Corporation) which expression shall unless repugnant to the context includes it's successors and/or assigns of one part and M/s \_\_\_\_\_ having it's Registered Office at ----- (herein after referred to as Contractor) which expression shall unless repugnant to the context includes it's successors and/or assigns of the other part.

WHERE AS UCIL invited Tenders to be submitted for the work of \_\_\_\_\_ mentioned in Tender document submitted by the Contractor as laid down in Annexure – A attached.

AND WHEREAS in pursuance of such invitation for Tender the Contractor submitted a Tender as in Annexure – A. AND WHEREAS after consideration of the Tender submitted the Contractor UCIL accepted the said Tender as in Annexure – A along with Annexure – B, C, & D.

AND WHEREAS one of the conditions embodied in the Tender submitted the contractor and accepted by UCIL was that the contractor upon acceptance of his Tender shall enter into an agreement with UCIL and shall deposit the sum of Rs. \_\_\_\_\_(Rupees \_\_\_\_\_ only) in a manner mentioned in the same Tender as in Annexure – A and it's subsequent modifications as in Annexure – D duly endorsed in favour of UCIL for the due observance fulfillment and performance by the Contractor of the terms, conditions and covenants on the part of the Contractor mentioned in the said Tender so accepted by UCIL.

And whereas UCIL has called upon the Contractor to execute the presents.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this agreement words and expressions shall have the same meaning as are respectively assigned to them in the General Conditions and Special conditions of Contract herein after referred.
2. The Corporation's LOI/Work Order Reference No. ----- along with the following documents shall be deemed to form and be read and construed as part of this agreement ass thoughtfully written out and set forth herein.



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a) ANNEXURE – A: Tender Document for \_\_\_\_\_  
\_\_\_\_\_ as specified in Tender specification vide N.I.T. No. TMD-

b) ANNEXURE – B: Bank Guarantee for Security Deposit

c) ANNEXURE – C: Detailed Bar Chart

d) ANNEXURE – D: Various correspondence and Minutes of Meeting to  
be read with Annexure – A as listed below:-

1)

2)

3)

4)

5)

In the event of discrepancy or ambiguity this agreement and any of the documents described above this agreement shall govern. In the event of discrepancy or ambiguity between or caused by the provisions in the documents (a) to (d) inclusive, the priority of these documents shall be settled in accordance with the order (d) to (a) i.e. the document executed on a later date prevailing over the document executed earlier.

3. The Contractor hereby covenants with the corporation to construct, complete and maintain the works in conformity in all respects with the provisions of the Agreement and as specified in the above documents (a) to (d) inclusive.

4. The Corporation hereby covenants to pay to the Contractor in consideration of the construction, completion and maintenance of the works the contract price at the tie and in the manner, prescribed by the Agreement and set-forth in the above documents (a) to (d) inclusive.

5. All notices called for by the terms of this agreement shall be effective only at the time of receipt thereof and only when received by the parties to whom they are addressed at the following addresses:

a) \_\_\_\_\_

URANIUM CORPORATION OF INDIA LIMITED  
(A Govt. of India Enterprise)

\_\_\_\_\_



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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. The corporation and the Contractor agree that this contract agreement including annexed documents (a) to (d) inclusive expresses all of the Agreement and covenants of the parties, and that it integrates, combines and supersedes all prior and contemporaneous negotiations, and agreements, whether written or oral and that no modification or alteration of this contract agreement shall be valid or binding on either party, unless expressed in writing and executed with the same formality as this contract agreement, except as may otherwise be specifically provided in this contract agreement.

7. Both parties shall make best individual to set amicably among themselves in a dispute that may arise on any matter arising out of or in connection with this contract. In the unlikely case that the parties or not able to come to a mutual settlement either of them shall seek arbitration. Then it is expressly agreed between the parties that any such dispute or difference arising out of or in connection with the contract shall be referred to arbitration and the arbitration proceedings shall be governed by the relevant clause of the Agreement.

31. This contract agreement is made in all good faith and executed in two identical counterparts, one for the corporation and the other for the Contractor.

IN WITNESS THEREOF, the Corporation and the Contractor have executed this contract agreement the day and year first above written.

\_\_\_\_\_  
\_\_\_\_\_

**URANIUM CORPORATION OF INDIA  
LIMITED**

\_\_\_\_\_  
in the presence of

\_\_\_\_\_  
\_\_\_\_\_

signed by the said

**CONTRACTOR**

\_\_\_\_\_  
in the presence of



**BANK GUARANTEE FORM FOR EARNEST MONEY**

This Deed of Guarantee made this \_\_\_\_\_ day  
\_\_\_\_\_ of Two Thousand Three by \_\_\_\_\_ Bank  
(hereinafter referred to as the Guarantor) in favour of M/s. Uranium Corporation of  
India Limited (A Government of India Enterprise) P.O. Jaduguda Mines, Dist.  
Singhbhum (East), Jharkhand – 832102 (hereinafter called 'UCIL') which expression  
shall unless repugnant to the context or meaning thereof be deemed to include its  
successors and assigns.

WHEREAS M/s. \_\_\_\_\_ (hereinafter referred to as  
Tenderer) is required to pay to UCIL a sum of Rs. \_\_\_\_\_ in the form of  
Bank Guarantee as Earnest Money in respect of their Proposal No. \_\_\_\_\_ dated  
\_\_\_\_\_ against NIT No. \_\_\_\_\_ dated \_\_\_\_\_ for the works as per terms  
and condition specified in NIT.

AND WHEREAS the Tenderer has approached the Guarantor and at their request and  
in consideration of the agreement arrived at between the Tenderer and the Guarantor,  
the Guarantor gives the guarantee as hereinafter mentioned in favour of UCIL.

NOW THIS DEED OF GUARANTEE WITNESSES AS FOLLOWS:

1. In consideration of UCIL having agreed to the said Tenderer furnishing a bank  
guarantee in lieu of earnest money in Bank Draft for a sum of  
Rs. \_\_\_\_\_ the Guarantor do hereby conversants irrevocably to  
undertake and promise to pay a sum of Rs. \_\_\_\_\_ to UCIL  
without demur and merely on demand from them, in case the Tenderer makes  
any default or commits any breach in the performance, observance or  
discharge of the terms and conditions contained in the said Tender.
2. The Guarantor further agrees that UCIL shall be the sole judge as to whether  
the said Tenderer has committed any breach or default in the performance,  
observance or discharge of the terms and conditions of the said Tender and the  
decision of UCIL shall be final and binding on the guarantor irrespective of the  
fact whether the Tenderer admits or denies the default or questions the  
correctness of any demand made by UCIL in any Court or Tribunal or  
Arbitration Proceedings or before any Authority.
31. It shall not be necessary for UCIL to proceed against the said Tenderer before  
proceeding against the Guarantor and the guarantee herein contained shall be  
enforceable against the guarantor notwithstanding any security which UCIL may have



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obtained from the Tenderer, shall at the time when proceedings are taken against the Guarantor, remain outstanding or authorized.

4. The Guarantee herein contained shall remain in full force and effect and the Guarantor shall be liable under the same irrespective of any concession or time being granted by UCIL to the Tenderer and the Guarantee shall remain in full force and effect irrespective of any other change in terms, conditions, stipulations or any variations in the terms of the tender and irrespective of whether notice of such change or variation is given to the Guarantor or not and the claim to receive such notice of any change and/or variation of the terms and conditions of the said Tender is hereby specifically waived by the Guarantor.
5. The Guarantor hereby agrees that it shall not be released from this Guarantee by any forbearance, exercise, or non-exercise of any of the powers or rights under the Tender by UCIL against the Tenderer or by any other matter or thing whatsoever which under the law relating to the sureties would but for this provision have the effect of so releasing the Guarantor irrespective of whether notice of such forbearance, exercise or non-exercise of any of the powers or rights under the Tender is given to the Guarantor or not.
6. The Guarantee herein contained shall not be determined or prejudiced by the liquidation or winding up or insolvency or any change in the Constitution of the Tenderer but shall in all respects and for all purposes be binding and operative until all payments or all moneys due or that may hereafter become due to UCIL are paid in respect of any liability or obligation of the Tenderer under the Tender subject, however, that UCIL shall have no right under this Guarantee after expiry of the validity of this guarantee unless this Guarantee is extended by mutual agreement.
7. The Guarantor hereby undertakes not to revoke this Guarantee during the period it is in force except with the previous consent of UCIL in writing.
8. Any claim or dispute arising under this Guarantee shall be enforced or settled in the courts of law at Jamshedpur, Jharkhand State.
9. The Guarantor hereby declares that it has power to execute this Guarantee under its Memorandum and Articles of Association and the executing has full powers to do so on its behalf under the Power of Attorney dated \_\_\_\_\_ granted to him by the proper authorities of the Guarantor.





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10. IN WITNESS whereof the \_\_\_\_\_(Bank) has hereunto set and subscribed its hands the day, month and year first above written.
11. NOTWITHSTANDING anything contained herein above our liability under the guarantee is restricted to Rs. \_\_\_\_\_will remain valid till \_\_\_\_\_ (Date) unless an action to enforce a claim under the guarantee is filed against us within \_\_\_\_\_. Such claim shall lapse and we shall be discharged from all liabilities under the guarantee.

Signature of the Person duly authorized to Sign on behalf of the Guarantor (Bank)

WITNESS:

Name and Address: Signature

1. \_\_\_\_\_

2. \_\_\_\_\_



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**BANK GUARANTEE FORM FOR SECURITY DEPOSIT**

Name of the bank: -----

Address of the bank: - -----

Guarantee No. :-----

Date: -----

Date of Expiry: -----

Claim period: 06 (Six) months from the date of expiry.

Limit of Liability: -----

Whereas Uranium Corporation of India Ltd. (herein after referred to as the CORPORATION) having its registered office at Jaduguda Mines P.O. & Dist. Singhbhum, Jharkhand – 832102 which expression shall, unless repugnant to the context, includes its legal representatives, successors and assigns, have entered into an Agreement (herein after referred to as the Agreement) with M/s. ....(herein after referred to as the contractor) having its registered office at .....which expression shall, unless repugnant to the context, include its legal representatives, successors or assigns, for .....(Name of work) letter of Intent/work order No....., dated.....described in the Agreement based on the Terms and conditions contained in the Agreement and whereas by the said Agreement CORPORATION has agreed to pay the CONTRACTOR for the services to be rendered by the CONTRACTOR in terms of the said Agreement.

And whereas, in accordance with the terms of the Agreement, the CONTRACTOR has to furnish Bank Guarantee for ..... (Name of work) for due performance fulfillment and observance of the terms and conditions of the Agreement and further covenanted with the CORPORATION to make good any deficiencies so as to fulfill in all respects the proposes for which the agreement is entered in to and in accordance with their operating and other conditions specified and to meet all the requirements specified in regard there to in the period/periods stipulated in the Agreement.

Now, by this Guarantee we, the CONTRACTOR (as principal) and ..... (Name and address of Bank) or held and firmly bound into CORPORATION in the sum of Rs. (Rupees.....only for the payment of which the CONTRACTOR and surety bound themselves, their successors, legal representatives and assigns jointly and severally by these presents.

Now the conditions of this Guarantee is such that if the CONTRACTOR (as principal) shall duly, faithfully and punctually perform and observe all the terms, provisions, conditions and stipulations of Agreement including covenants, concerning Bank Guarantee stipulated therein on



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the part of the CONTRACTOR (as principal) to be performed and observed according to the true purpose, intent and meaning thereof or if on default of CONTRACTOR the CONTRACTOR shall satisfy and discharge the damages sustained by the CORPORATION there by up to the amount of this Bank Guarantee herein, then the obligation herein shall be null and void, but otherwise shall be in full force and effect for a period of .....months i.e. upto.....from ..... But no alterations in the terms of the said Agreement made between CORPORATION and CONTRACTOR or the extent or the nature of the materials supplied, completed and maintained there under and no allowance of time by the CONTRACTOR or CORPORATION under the AGREEMENT nor any forbearance in respect of any matter of thing concerning the said Agreement on the part of CORPORATION shall in any way release the CONTRACTOR from any liability under the Guarantee herein.

We do hereby under take to pay the amount due and payable under this Bank Guarantee without any demur, merely on demand from CORPORATION stating that the amount claimed is due by way or the loss or damages caused to or suffered or would be caused to or suffered by CORPORATION by reason of any breach by the said CONTRACTOR (as principal) of the terms and conditions obtained in the said Agreement or by reason of the said CONTRACTOR'S (as principal) failure to comply with any of the conditions with regard to the Agreement set out in this Bank Guarantee. Any such demand made on the CONTRACTOR shall be conclusive as regards the amount due any payable by the CONTRACTOR under this Guarantee.

However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs..... (Rupees.....only).

We further covenant that the Guarantee herein contained shall remain in full force and effect and that it shall continue to be enforceable till the dues of the CORPORATION claim satisfied or discharged or till CORPORATION certifies that the terms and conditions of the said Agreement have been fully and properly carried out by said CONTRACTOR (as principal) and discharges the Guarantee.

We, the surety, further covenant with CORPORATION that CORPORATION shall have fullest liberty without our consent end without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement from time to time, to postpone for any time or from time to time, any of the powers exercisable by CORPORATION against the said CONTRACTOR (as principal) and to forbear or enforce any of the terms and conditions relating to said Agreement and we shall not be relieved from our liability by reason of any such variations, or extension being granted to said CONTRACTOR or for any forbearance, act of omission on the part of CORPORATION, or any indulgence by CORPORATION to the said CONTRACTOR (as principal) or by any such matter or thing what so ever, which under the law relating to sureties would but for this provision, have effect of so relieving.

This Guarantee herein contained is not revocable by notice during its currency and will remain in full force until all the under taking covenants, terms and conditions of Agreement are performed and fulfilled or until it is discharged by notice in writing by CORPORATION.



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This Guarantee will remain in force upto ..... months from.....i.e. upto .....and will stand automatically cancelled on expiry of the said period unless extended by mutual Agreement. Unless a demand or claim to enforce the claim under this Guarantee is made in writing against the surety within 6 (Six) months from the date of expiry of this Guarantee, all the rights of the CORPORATION hereunder against the surety shall be relieved and discharged from all the liabilities hereunder.

IN WITNESS WHERE OF, the CONTRACTOR (as principal) and surety have executed this Guarantee and have affixed their seals on this date ..... Now withstanding any thing contained herein before our liability under the present Guarantee is restricted to Rs.....(Rupees.....only) and shall remain in force for a period of .....months i.e. upto .....from..... Unless a suit or action is instituted to enforce the claim under the Guarantee within 6 months from the said date all your rights under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

PRINCIPAL	SURETY
For and behalf of (Name of firm)	For and behalf of (Name of Bank)



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**SCHEDULE - B**

**MATERIALS FOR ISSUE TO THE CONTRACTOR**

Sl. No.	Particulars	Rate at which material Will be issued		Place of issue
		Unit	Rate (Rs.)	

NIL



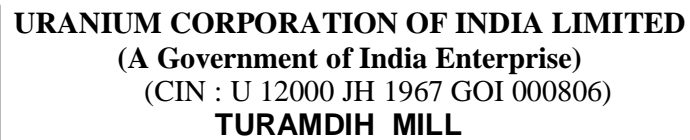
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## **SCHEDULE – C**

**TOOLS AND PLANTS OF UCIL TO BE HIRED TO THE CONTRACTOR**

Sl. No	Particulars	Number available	Hire Charges per unit per working day (Rs.)	Frequency of maintenance	Value per unit	Place of Issue	Number required by the Contractor
			NIL				



## SCHEDULE-D

39



**S C H E D U L E - F**

**REFERENCE TO GENERAL CONDITIONS OF THE CONTRACT**

Clause  
No.

3(b)	Accepting Authority	Chairman & Managing Director, UCIL
3(i)	Market rate percentage addition to overheads and profit	Fifteen Percent
9.	Security Deposit	Ten percent of the contract sum including earnest Money.
12.	Date of commencement	15 (Fifteen) Days from the date on which written order issued to commence the work/ As per LOI/WO
12.	Date of completion	12 (Twelve) months from the date of commencement
32.1	Agreed liquidated damage	Upto a maximum of 10 percent of the contract as per clause 32.1
33.	Defect Liability Period	12 month from date of completion
48.	On Account payment	Monthly
9(d)	Refund of security deposit	50% of total security deposit
34.	Insurance	as directed
52.1	Authority for appointing arbitrator.	Chairman & Managing Director, UCIL





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## **SECTION – V**

### **GENERAL CONDITIONS**



### **GENERAL CONDITIONS OF CONTRACT**

#### **A) *INTERPRETATIONS AND DEFINITIONS***

##### **1. Singular and Plural**

Where the context so requires, words importing the singular only also include the plural and vice versa.

##### **2. Heading and Marginal Notes to conditions:**

Heading and marginal notes to these General Conditions shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.

##### **3. Definitions:**

- a) 'Corporation' shall mean Uranium Corporation of India Limited having its registered office at Jaduguda Mines, Post office and Town Jaduguda Mines – 832 102, in the state of Jharkhand and includes a duly authorized representative of the Corporation or any other person empowered in this behalf by the Corporation to discharge all or any of its functions.
- b) The 'Accepting Authority' shall mean the authority mentioned in Schedule – F.
- c) The 'Contract' shall mean the notice inviting the tender, the tender, and acceptance thereof and the formal agreement, if any, executed between the Corporation and the Contractor together with the documents referred to therein including these conditions, Designs, Drawings, Schedule of Quantities with rates and amounts and Schedule of Rates. All these documents taken together shall be deemed to form one Contract and shall be complementary to one another.
- d) The 'Contractor' shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal representatives of such individual or persons composing such firm or unincorporated company, or successors of such firm or company as the case may be and permitted assigns or such individual or firm or company.
- e) The 'Contract Sum' shall mean:

In the case of Lump Sum Contracts the sum for which the tender is accepted.



- ii) In the case of percentage Rate Contracts the estimated value of the works as mentioned in the tender adjusted by the Contractor's percentage.
- iii) In the case of Item Rate Contracts the cost of the works arrived at after multiplying of the quantities shown in Schedule of Quantities by the item rates quoted by the Tenderer or as finally accepted for the various items.
- f) A 'Day' shall mean a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day.
- g) 'Engineer-in-charge' shall mean the Engineering Officer appointed by the Corporation or his duly authorized representative who shall direct, supervise and be in-charge of the works for purpose of this Contract.
- h) 'Excepted Risks' are risks due to riots (otherwise than among Contractors' Employees) and civil commotion (in so far as both these are uninsurable), war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, damage from aircraft, acts of god such as earth quake, lightning and unprecedented floods and other causes over which the Contractor has no control and accepted as such by the Accepting authority.
- i) 'Market Rate' shall be the 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 profit.
- j) Schedule(s) referred to in these conditions shall mean the relevant Schedule(s) annexed to the tender papers issued by the Corporation or the standard Schedule of Rates prescribed by the Corporation and the amendments thereto issued from time to time.
- k) The 'Site' shall mean the lands and/or other places on, under, in or through which the work is to be executed under the Contract including any other lands or places which may be allotted by the Corporation or used for the purposes of the Contract.
- l) 'Temporary Works' shall mean all temporary works of every kind required in or about the execution, completion, and maintenance of the works.
- m) 'Urgent Works' shall mean any urgent measures which, in the opinion of Engineer-in-Charge, become necessary during the progress of the works, obviate any risk of accident or failure of which become necessary for security.



- n) A 'Week' shall mean seven days without regard to the number of hours worked any day in that week.
- o) The 'Works' shall mean the works to be executed in accordance with the Contract or part(s) thereof as the case may be and shall include all extra or additional, altered or substituted works or temporary and urgent works as required for performance of the Contract.

**B) SCOPE AND PERFORMANCE**

**4. Contract Documents:**

The Contractor shall be furnished, free of charge, two certified true copies of the Contract documents except standard specification, the Schedule of Rate and of all further drawings, which may be issued during the progress of the works. He shall keep one copy of the Documents on the site in good order and the same shall at all reasonable times be available for inspection and use by the Engineer-in-Charge, his representative or other Inspecting Officer.

- 4.1 None of these documents shall be used by the Contractor for any purpose other than that of this Contract.
- 4.2 The Contractor shall take necessary steps to ensure that all persons employed on any work in connection with Contract have noticed that the Indian official secret act 1923(XIX of 1923) applied to them and shall continue so to apply even after the execution of such works under the Contract.

**5. 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, 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 shall, unless otherwise stated, be held to include waste on materials, carriage and cartage carrying in return of empties, hoisting, setting, fitting and fixing in position and all other labourers necessary in and for the full and entire execution and completion as aforesaid in accordance with good practice and authorized principles.

**6. Inspection of site:**

The Contractor shall inspect and examine the site and its surrounding and shall satisfy himself before submitting his tender as to the nature of the ground and sub-soils(so far as is practicable), the form and nature of the site, the quantities and nature of work and materials necessary for the completion of the works and the means of access to the site, the accommodation he may require, availability of



labour, water, electric power. In general he shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his tender. No extra charges consequent on any misunderstanding or otherwise shall be allowed.

**7. Sufficiency of Tender:**

Description of item in the Schedule of quantities is brief and therefore, shall be read in conjunction with the relevant drawings and specifications and the Contractor's rate shall be deemed to be for such complete work unless otherwise specified by the Contractor while tendering. No claim, whatsoever, shall be entertained by the Corporation on account of insufficiency of any rate as quoted in the Schedule of Quantities and rates. The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender of the works and of the rates and prices quoted in the Schedule of Quantities, in 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, maintenance of works and shall also cover the cost of necessary protection, including labour, materials and equipment to ensure safety and protection against all risks, accidents compensation for injury to life and damage to property if any caused by the Contractor's operations connected with the work. The rates shall be firm and shall not be subject to change due to variation during the entire period of execution of the work in cost of materials, labour conditions or any other conditions whatsoever. The rates quoted by the Tenderer shall be inclusive of all taxes, duties and other statutory levies.

**8. Discrepancies and Adjustment of Errors:**

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

- 8.1 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.
- 8.2 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 the execution of the whole or any part of the works comprised there in according to drawings and specifications or from any of his obligations under the Contract.
- 8.3 If on check there are found to be difference between the rates given by the Contractor in words and figures or in the amount worked out by him in the



Schedule of Quantities and general summary the same shall be adjusted in accordance with the following rules:

- a) In the event of a discrepancy between description in words and figures quoted by a Tenderer, the description in words shall prevail.
- b) In the event of error occurring in the amount column of Schedule of Quantities as a result of wrong extension of the Unit rate and quantity, the Unit rate shall be regarded as firm and extension shall be amended on the basis of the rate.
- c) All errors in totaling in the amount column and carrying forwarded totals shall be corrected.
- d) The totals of various sections of Schedule of Quantity appended and amended shall be carried over to the general summary and the tendered such amended accordingly. The tendered sum so altered shall, for the purpose of the tenders be substituted for sum originally tendered and considered for acceptance instead of the original sum quoted by the Tenderer. Any rounding off of totals in various sections of Schedule of quantities or in general summary by the Tenderer, shall be ignored.
- e) In case of lump sum Contracts (based on bills of quantities/ quantity not shown as provisional), should any error in quantities or any omissions of items be discovered, the cumulative effects of which varies Rs. 20,000/- whichever is less, then the errors shall be rectified and the rectifications dealt with as for deviations/variations under conditions 10 and 11 hereof, and the value thereof shall be added or deducted from the Contract sum, as the case may be, provided that there shall be no rectification of any errors, omissions or wrong estimates in the prices inserted by the Contractor in the Bills of quantities.

## **9 Security Deposit:**

Total amount of Security deposit shall be limited to 10% of the awarded value of work. Fifty percent of this amount shall have to be deposited as initial security deposit at the time of execution of agreement including the amount deposited as Earnest Money.

### **(a) Acceptable mode of payment of Initial Security Deposit:**

- i) For deposit up to Rs. 5,000/-: Cash/Demand Draft payable at SBI, Jaduguda/Hartopa.
- ii) For deposit beyond Rs. 5,000/- and up to Rs. 1.00 Lakh.: DAC/TDR/FDR etc. from any Nationalised bank of schedule Banks duly pledged in favour of



**URANIUM CORPORATION OF INDIA LIMITED**  
**(A Government of India Enterprise)**  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

**NIT No.**  
**TMD / 623**

UCIL. The Tenderer should submit Bank Guarantee issued by SBI, Jamshedpur/Hartopa or PNB, Jamshedpur or as mentioned in Para 9(a)(iii).

- iii) For deposit beyond Rs. 1.00 Lakhs: Bank Guarantee issued by SBI, Jaduguda/ Hartopa or Punjab National Bank, Jamshedpur or from Bank Guarantee obtained from any Indian nationalized bank of schedule banks to be jointly, severally bound with the Contractor to the purchaser for the amount same above. The terms of the said guarantee shall be such as shall be approved by the purchaser and the obtaining of such guarantee and the cost of guarantee to be so entered shall be at the expenses, in all respects, of the Contractor. The said guarantee shall be valid till the expiry of the defect liability period and issue of the final certificate by the Engineer, and with a claim period of Six months beyond it's required validity.

In addition to the above, further amount to the extent of the 5% of awarded value of the work will be deducted from the Running Account bills by way of percentage deductions. Such percentage deduction shall be @ 10% of the running account bills till the full amount of security deposit is realized/ retained by the Corporation.

- (b) All compensation or other sums of money payable by the Contractor under the terms of this contract or any other contract or any other account whatsoever may be deducted from or paid by sale of a sufficient part of his security deposit or from the interest arising there from or from any sums which may be due or become due to the Contractor by the Corporation or any account whatsoever and in the event of his security deposit be reduced by reason of any such deduction or sale as aforesaid, the Contractor shall within fourteen days of receipt of notice of demand from the Engineer-in-charge make good the deficit.

(c) **Refund of Security Deposit:**

Initial Security Deposit shall be refunded to the Contractor on the Engineer-in-charge certifying in writing that the work has been completed as per condition 31 hereof etc.

- (d) On expiry of the Defects liability period (referred to in condition 33 hereof) or after payment of the Final bill payable which ever is later, the Engineer-in-charge shall on request from the Contractor refund to him the remaining portion of the security deposit provided the Engineer-in-charge is satisfied that there is no demand outstanding against the Contractor.

10. **Deviation / Variation Extent & Pricing:**

The Engineer-in-charge shall have power (i) to make alteration in, omissions from, additions to, or substitution for the original specification, drawings design 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 above specified as part of the works, shall be carried out by the Contractor on the same conditions in all respects including price on which agreed to do the main work except as hereinafter provided. No work which radically changes the original nature of the Contract shall be ordered by the Engineer-in-charge as a deviation and in the event of any deviation being ordered which in the opinion of the Contractor changes the original nature of the Contract, he shall nevertheless carry it out and the disagreement as to the nature of the work and the rate to be paid therefore shall be resolved in accordance with condition 52.

- 10.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the Contract sum being ordered, be extended as follows if requested by the Contractor.
- a) In the proportion which the additional cost of the altered additional or substituted work, bears to the original Contract sum plus
  - b) 25% of the time calculated in (a) above or such further additional time as may be considered reasonable by the Engineer-in-charge.
- 10.b.1 Rate for such additional altered or substituted work shall be determined by the Engineer-in-charge as follows:-
- i) If the rate for additional, altered or substituted items of works is specified in the Schedule of Quantities, the Contractor shall carry out the additional, altered or substituted item at the same rate. In the case of composite tenders, where two or more Schedules of Quantities may form part of the Contract, the applicable rate shall be taken from the Schedule of Quantities of that particular part in which the deviation is involved, failing that, at the lowest applicable rate for the same item of work in the other Schedule of Quantities.
  - ii) If rate for any altered, additional or substituted item of work is not specified in the Schedule of Quantities, the rate for that item shall be derived from the rate for the nearest similar item specified therein. In case of composite Tenders, where two or more Schedule of Quantities form part of the Contract, the rate shall be derived from the nearest similar item in the Bills of Quantities of the particular part of works in which the deviation is





involved, failing that, from the lowest of the nearest similar item in other Schedule of Quantities.

- iii) If the rate for any additional, altered or substituted item of work can not be determined in the manner specified in sub-paras (i) and (ii) above, then such item of the work shall be carried out at the rate entered in the C.P.W.D. Schedule of Rates(current) then plus/minus the percentage by which the tendered amount of the work actually awarded is higher or lower than the estimated amount of the works actually awarded. (Applicable to measurement Contract is based on item rates or lump sum Contracts based on Bills of Quantities or percentage rate Contracts).
- iv) If the rate for any altered, additional or substituted item of work can not be determined in the manner specified in sub-Para (i) to (iii) above, the Contractor shall within 14 days of the date of receipt of the order to carry out the said work, inform the Engineer-in-charge of the rate which he proposed to claim for such item of work, supported by analysis of the rate claimed, and the Engineer-in-charge shall within three months thereafter, after giving due consideration to the rate claimed by the Contractor determine the rate on the basis of market rate(s). In the event of the Contractor failing to inform the Engineer-in-charge within the stipulated period of time, the rate, which he proposes to claim, the rate for such item shall be determined by the Engineer-in-charge on the basis of market rate(s). For this purpose the purchase voucher etc. shall be produced by the Contractor to the Engineer-in-charge.

**11. Suspension of works:**

The Contractor shall on receipt of the order in writing of the Engineer-in-charge suspend the process of the works or any part thereof for such time and in such manner as the Engineer-in-charge may consider necessary for and of the following reasons.

- i) On account of any default on part of the Contractor or
- ii) For proper execution of the works or part thereof for reasons other than the default of the Contractor; or
- iii) For safety of the works or part thereof.

**12. 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 of the essence of the Contract. The execution of the work shall commence from the date of 15<sup>th</sup>



day after the date on which the Engineer-in-charge issues written orders to commence the work or from the date of handing over the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, Corporation shall without prejudice to any other right or remedy be at liberty to forfeit the Earnest Money/Security Deposit absolutely.

13.1 As soon as possible, after the Contract is concluded, the Engineer-in-charge and the Contractor shall agree upon a Time and Progress Chart. The Chart shall be prepared in direct relation to the time stated in the Contract Documents for completion of items of the work. It shall indicate the force of the dates of commencement and completion of various trades or sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the Contractor within the limitation of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the Contractor shall minimum in all cases in which the time allowed for any work exceed one month(save for special jobs) complete  $1/8^{\text{th}}$  of the whole of the work before  $1/4^{\text{th}}$  of the whole time allowed in the Contract has elapsed  $3/8^{\text{th}}$  before  $3/4^{\text{th}}$  of such time has elapsed.

13.2 If the works be delayed by

- (a) Force major, or
- (b) Abnormally bad weather, or
- (c) Serious loss or damage by fire, or
- (d) Civil commotion, local combination of workmen, strike or engaged by Corporation in executing work not forming part of the Contract, or
- (e) Delay on the part of other Contractor or tradesman engaged by Corporation in executing work on to forming part of the Contract, or
- (f) Non-availability of stores which are the responsibility of Corporation to supply, or
- (g) Non-availability or break-down of Tools and Plant to be supplied or supplied by Corporation or
- h) Any other cause, which, in the absolute discretion of the Corporation, is beyond the Contractor's control.

Then upon the happening of any such event causing delays, the Contract shall immediately give notice thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his best endeavors to prevent or



make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the work.

- 13.3 Request for 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 delays. The Contractor may also, if practicable indicate, in such request, the period for which extension is desired.
- 13.4 In any such case, the Corporation may give a fair and reasonable extension of time for completion of the work. Such extension shall be communicated to the Contractor by the Engineer-in-charge in writing within 3 months of the date of receipt of such requests by the Engineer-in-charge.
14. The Contractor shall arrange at his own expenses all tools, plant and equipment (hereinafter refer to as T & P) required for execution of the work.
- 14.1 If the Contractor required any item of T & P on hire from the Corporation, the Corporation will, if such item is available and the same can be spared, hire it to the Contractor at a rate to be fixed by the Engineer-in-charge.
- 14.2 The period of hire will be reckoned from the commencement of the day of issue up to the end of the day of return (including all recognized holidays) irrespective of the actual hour of issue and return. The Contractor will be exempt from levy of any charges for the number of days he is called upon in writing by the Engineer-in-charge to suspend execution of the work, provided Corporation's T & P in question has, in fact, remained idle with the Contractor because of the suspension, provided the Contractor, in case the period of suspension, exceeds 11 days returns Corporation's T & P to the place from where the same was issued.
- 14.3 The Contractor shall be responsible for care and custody of Corporation's T & P (including employment of chowkidar's) during the period Corporation's T & P remain with him and any damage (fair wear and tear excepted) to any of the equipment shall be made good at the Contractor's expense to the satisfaction of the Engineer-in-charge, unless, such damage is caused because of negligence of crew provided by the Corporation.
- 14.4 The Corporation give no guarantee in respect of output of his T & P hired to the Contractor and no reduction in rates or any compensation shall be allowed on the ground that outturn or performance of Corporation's T & P was not to the Contractor's expectations.



- 14.5 Corporation's T & P hired to the Contractor shall be returned at the place of issue (unless otherwise directed) by the Contractor to the Engineer-in-charge on completion of the work or section of the work or earlier on termination of the hire by the Corporation as hereinafter provided on a written notice by the Engineer-in-charge. The Corporation shall be entitled to terminate the hire on two days notice without assigning any reason whatsoever on account of termination of hire of Corporation's T & P by the Corporation. In such an event however, a reasonable extension of time shall be given by the Engineer-in-charge.
- 14.6 A Log Book for recording hours during which every item of Corporation's T & P issued to the Contractor has worked each day, shall be maintained by the member of the crew-in-charge thereof or any representative of the Engineer-in-charge appointed in that behalf and shall be daily attested by the Contractor or his authorized agent. In case the Contractor contest correctness of any entry and/or fails to sign the Log Book, the decision of the Engineer-in-charge shall be final and binding on him. Hire charges shall be calculated in accordance with the Log Book recorded time or as per term hiring as the case be.

**MATERIALS:**

- 15(a) The Contractor shall, at his own expense, provide all materials required for the works other than those, which are to be supplied by the Corporation.
- 15(a) 1. All materials to be provided by the Contractor shall be, in conformity with the specification laid down in the relevant Indian Standard and the Contractor shall, if required by the Engineer-in-charge, furnish proof, to the satisfaction of the Engineer-in-charge, that the material so comply with the specifications.
- 15(a)2 The Contractor shall at his own expense and without delay supply to the Engineer-in-charge samples of materials proposed to be used in the works. The Engineer-in-charge shall, within seven 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.
- 15(a) 3. The Engineer-in-charge shall have powers to require removal of all of the materials brought at site by the Contractor which are not in accordance with the Contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials, the Engineer-in-Charge shall have full powers to procure other proper materials to be substituted for rejected materials and in the event of the Contractor refusing to comply, he may cause the same to be supplied by other. All costs, which may accrue upon such removal and/or substitution, shall be borne by the Contractor.



- 15(a) 4. The Contractor shall indemnify the Corporation servant or employee of the Corporation against any action, claim or proceeding relating to infringement or use of any patent or design or any other charges which may be payable in respect of or any article or materials or part thereof included in the Contract. In the event of any claim being made or action being made or action being brought against the Corporation in respect of any such matters as aforesaid, the Contractor shall furnish indemnity immediately, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions/issued by the Corporation. But the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so being reimbursed to the Contractor only if the use was the result of any drawing and/or specification issued after submission of the Tender.
- 15(a)5. All charges on account of Octroi, Terminal or Sales Tax and other duties or materials obtained for the works from any source (excluding materials supplied by the Corporation) shall be borne by the Contractor.
- 15(a)6. The Engineer-in-charge shall be entitled to have tests carried out for any materials supplied by the Contractor other than those for which satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities, which the Engineer-in-charge may require for the purpose.
- 15(b) **Materials to be supplied by the Corporation:**
- Materials to be supplied by the Corporation are shown in Schedule – B that also stipulates quantum, place of issue and rate(s) to be charged in respect thereof.
- 15(b)1. If after acceptance of the tender, the Contractor desires the Corporation to supply any other materials, such materials may be supplied by the Corporation, if available, at rates to be fixed by the Engineer-in-Charge and all on payment before the materials are issued to the Contractor.
- 15(b) 2. For the materials listed in Schedule-B, which the Corporation has agreed to supply the Contractor, he shall give reasonable notice in writing about his requirements to the Engineer-in-charge in accordance with the agreed phases of programme. Such materials shall be supplied for the purpose of the Contract of aforesaid Schedule, shall be set off or deducted, as and when materials are consumed in item of work for which payment is being made to the Contractor, or from any sums then due or which may after become due to the Contractor from/under the Contract. At the time of submission of bills the Contractor shall properly account for the materials issued to him to the satisfaction of the Engineer-in-charge and certify that balance of materials supplied is available at site.



- 15(b) 3. The Contractor shall bear the cost of loading, transporting to site, unloading, storing under cover as required, assembling and joining the several parts together as necessary, incorporating of fixing materials in the works including all preparatory work of whatever description as may be required.
- 15(b)4. All materials issued to the Contractor by the Corporation for fixing in the works (including preparatory work), and being surplus on completion or on foreclosure of the work be returned by the Contractor at his expense, at wear and tear and/or waste. If the Contractor is required to deliver such materials at a place other than the place of issue, he shall do so and the transportation charges from the site to such place, less the transportation charges which would have been incurred by the Contractor had such materials been delivered at the place of issue, shall be borne by the Corporation.
- 15(b)5. Surplus materials returned by the Contractor shall be credited to him by the Engineer-in-charge at rates not exceeding those at which these were originally issued to him after taking into consideration any determination or damage which may have been caused to the said materials whilst in the custody of the Contractor.
- 15(b)6. If on completion of works the Contractor fails to return surplus materials out of these supplied by the Corporation, then in addition to any other liability which the Contractor would incur, the Engineer-in-charge may, by a written notice to the Contractor require him pay within a fortnight of receipt of the notice, for such unreturned surplus materials at double the issue rates.
- 15(b) 7. **Delay in obtaining materials by the Corporation:**

Owing to difficulty in obtaining certain controlled and other materials in the market, the Corporation has undertaken to supply them as specified in Schedule – B, there may be delay in obtaining these materials by the Corporation and the Contractor is therefore, required to keep himself in touch with the day to day position regarding the supply of materials from the Engineer-in-charge and to so adjust the progress of the work that their labour may not remain idle nor may there be any other claim due to or arising from delay in obtaining the materials. It should be clearly understood that no claim whatsoever shall be entertained by the Corporation on account of delay in supplying materials.

## **15 GENERAL**

Materials required for the works, whether brought by the Contractor or supplied by the Corporation, shall be stored by the Contractor only at places approved by the Engineer-in-charge. Storage and safe custody of materials shall be the responsibility of the Contractor.



15.1. Corporation official concerned with the Contract shall be at liberty any time to inspect and examine any materials intended to the use in or on the works, either on the site or at factory or workshop or other place(s), where such materials are assembled, fabricated, manufactured or any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.

15.2. Materials supplied by the Corporation and brought to the site by the Contractor shall not be removed off the site without the prior written approval of the Engineer-in-Charge. But whenever the works are finally completed, the Contractor shall at his own expense forthwith return to the all surplus materials originally supplied to him as per stipulation in the Contracts.

**16. LABOUR**

The Contractor shall employ labour in sufficient numbers to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the Contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the works any person who has not completed his eighteen years of age.

16.1 The Contractor shall furnish to the Engineer-in-Charge at the intervals as decided by E.I.C., a distribution return of the number and description by trades of the work, people employed on the works. The Contractor shall also submit on the 4<sup>th</sup> and 19<sup>th</sup> 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 (i) the accident that occurred during the said fortnight showing the circumstances under which they happened and the extent of damages and injury caused by them and (ii) the number of female workers who have been allowed Maternity Benefit as provided in the Maternity Benefit Act 1961 or Rules made there under and the amount paid to them.

16.2 The Contractor shall pay to labour employed by him wages not less than fair wages as defined in the Contract Labour (Regulation & Abolition) Act, 1970 and Rules made there under.

16.3 The Contractor shall in respect of labour employed by him comply with or cause to be complied with the Contract Labour (Regulation & Abolition) Act, 1970 and Rules made there under in regard to all matters provided therein.

16.3A The Contractor shall comply with the provisions of EPF & MP Act 1952 for the purpose of provident fund to their contract laborers

16.4 The Contractor shall comply with the provision of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Dispute Act, 1947, Maternity Benefit Act, 1961 and Mines Act, 1952 or any modifications thereof or any other Law relating thereto and rules made there under from time to time.



- 16.4(a) The Contractor shall be liable to pay his contribution and the Employees Contribution to the Employees State Insurance scheme in respect of all labour employed by him for the execution of the Contract, in accordance with provision of 'The Employees State Insurance Act, 1948' as amended from time to time and as applicable in this case. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in-Charge shall recover from the running bills of Contractor an amount of Contribution as assessed by him. The amount so recovered shall be adjusted against the actual contribution payable under Employees State Insurance scheme.
- 16.5 The Engineer-in-charge shall on a report having been made by an Inspecting staff as defined under the Contract Labour (Regulation) Act, 1970 and rules made there under have the power to deduct the money, due to the Contractor, any sum required 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 workers, non payment of wages or of deduction made from his or their wages which are not justified by the terms of the Contract or non-observance of the said act.
- 16.6 The Contractor shall indemnify the Corporation against any payment to be made under and for observance of the Contract Labour (Regulation & Abolition) Act, 1970 and Rules made there under without prejudice to his right to claim indemnity from his Sub-Contractors.
- 16.7 In the event of the Contractor committing a default or breach of any of the provisions of aforesaid Act and rules made amended/amended from time to time, or furnishing any information or submitting or filling any Form/Register/Slip under the provisions of the Law which is materially incorrect, then on the report of the Inspecting Officer, the Contractor shall without prejudice pay to the Corporation a sum not exceeding liabilities for such defaults including liquidated damages etc. for every default, breach or furnishing, making, submitting, filling materially incorrect statement, as may be fixed by the Labour Department and the Contractor should indemnify the Corporation against all such liabilities.

**16.7.1 Model Rules for Labour Welfare:**

The Contractor shall at his own expense comply with or cause to be complied with Model Rules for Labour Welfare as provided under the Rules framed by the appropriate government from time to time for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the Contractor fails to make arrangements as aforesaid, the Engineer-in-charge shall be entitled to do so and recover the cost thereof from the Contractor.

Failure to comply with Model Rules for Labour Welfare, Safety code or the provisions relating to report on accidents and to grant Maternity Benefits to female





workers shall make the Contractor liable to pay to the Corporation as liquidated damages an amount not exceeding Rs. 50.00 for each default on materially incorrect statement or reports from the Engineer-in-charge in such matters, based on reports from the Inspecting officers shall be final and binding and deductions for recovery of such liquidated damages may be made from the any amount payable to the Contractor.

17. The Contractor shall not be permitted to enter on (other than for inspection purpose) or take possession of the site until instructed to do so by the Engineer-in-charge in writing. The portion of the site to be occupied by the Contractor shall be defined and/or marked on the site plan, failing which these shall be indicated by the Engineer-in-charge at site and the Contractor shall on no account be allowed to extend his operations beyond these areas.

In respect of any land allotted to the Contractor for purpose of or in connection with the Contract, the Contractor shall be a licensee subject to the following and such other terms and the licensor may impose conditions as:

- i) That he shall pay a nominal license fee of Rs. 1 per year or part of a year for use and occupation, in respect of each and every separate area of land allotted to him
- ii) That such use or occupation shall not confer any right of tenancy of the land to the Contractor
- iii) That the Contractor shall be liable to vacate the land on demand by the Engineer-in-charge.
- iv) That the Contractor shall have no right to any construction over this land without the written permission of the Engineer-in-charge. In case he is allowed to construct any structure he shall have to demolish and clear the same before handing over the completed work unless agreed to the Corporation.

- 17.1 The Contractor shall provide, if necessary or if required on the site all temporary access there to and shall alter, adopt and maintain same as required from time to time and shall take up and clear them away as and when no longer required and as and when ordered by the Engineer-in-charge and make good all damage done to the site.

18. **SETTING OF THE WORKS:**

The Engineer-in-Charge shall supply dimensioned drawings, levels and other information necessary to enable the Contractor to set out the work. The Contractor shall provide all labour and setting out appliances required and set out the work and be responsible for the accuracy of the same. He shall amend at his



own cost and to the satisfaction of the Engineer-in-charge any error found at any stage which may arise through inaccurate setting out unless such error is based on incorrect data furnished in writing by the Engineer-in-charge, in which case cost of rectification shall be borne by the Corporation. The Contractor shall protect and preserve all benchmarks used in setting out the works till end of the Defect Liability Period unless the Engineer-in-Charge directs their earlier removal.

19. **SIDE DRAINAGE:**

All water, which may accumulate on the site during the progress of works or in trenches and excavations, shall be removed from the site to the satisfaction of the Engineer-in-charge and at the Contractor expenses.

20. **NUISANCE:**

The Contractor shall not at any time do, cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance, inconvenience to owners, tenants or occupiers of other properties near the site and to the public generally.

21. **MATERIALS OBTAINED FROM EXCAVATION:**

Materials of any kind obtained from excavation on the site shall remain the property of the Corporation and shall be disposed of as the Engineer-in-charge may direct.

22. **TREASURE TROVE, FOSSILS ETC.:**

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of the Corporation and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such articles or thing and shall immediately open discovery thereof and before removal, acquaint the Engineer-in-charge and obtain his directions as to the disposal of the same at the expense of the Corporation.

23. **PROTECTION OF TREES:**

Tree designated by the Engineer-in-charge shall be protected from damage during the course of the works and earth level within 1.0 Mtr. Of each such tree shall not be changed. Where necessary, such trees shall be protected by providing temporary fencing.

24. **WATCHING AND LIGHTING:**



The Contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the Engineer-in-charge for the protection of the works or for the safety and convenience of those employed on the works or the public.

**25. CONTRACTOR'S SUPERVISION – SUPERVISORY STAFF:**

The Contractor shall engage and keep at site, qualified technical staff/engineer with necessary supporting supervisory staff of sufficient experience of all types of works covered by this Contract and they should have all necessary authority to receive materials from the Corporation, issue valid receipt for the same, engage labour etc. and proceed with the work as required for speedy execution of the work.

**26. INSPECTION AND APPROVAL:**

All works embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice to the Engineer-in-Charge or his authorized representative when each stage is ready. In default of such notice the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof.

26.1 No work shall be covered up or put out of view without the approval of the Engineer-in-charge or his authorized representative and the Contractor shall afford full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination foundations before permanent work is placed thereon. The Contractor shall give the notice to the Engineer-in-Charge or his authorized representative whenever any such work or foundation is ready for examination and the Engineer-in-charge or his representative shall without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundation. In the event of the failure of the Contractor, such work shall be uncovered at the Contractor's expense for examination by the Engineer-in-Charge.

26.2 Corporation officers concerned with the Contract shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

**27. DUTIES AND POWERS OF ENGINEER-IN-CHARGE'S REPRESENTATIVE:**

The duties of the Representative of the Engineer-in-Charge are to watch and supervise the works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to order any work involving any extra payment by the Corporation nor to make any variation in the works.



- 27.1 The Engineer-in-charge may from time to time in writing delegate to his Representative any of the powers and authorities vested in the Engineer-in-charge and shall furnish to the Contractors a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the Representative of the Engineer-in-Charge to the Contractor within the terms of such delegation shall bind the Contractor and the Corporation as though it had been given by the Engineer-in-charge.
- 27.2 Failure of the Representative of the Engineer-in-Charge to disapprove any work or materials shall not prejudice the power of the Engineer-in-Charge there after to disapprove such work or materials and to order pulling down, removal or breaking up thereof.
- 27.3 If the Contractor shall be dissatisfied with any decision of the Representative of the Engineer-in-Charge, he shall be entitled to refer matter to the Engineer-in-Charge who shall thereupon confirm, reverse vary such decision.
28. **REMOVAL OF WORKMEN:**
- The Contractor shall employ in and about the execution of the works such persons as are skilled and experienced in their several trades and Engineer-in-Charge shall be at liberty to object to and require the Contractor or to remove from the works any person employed by the Contractor in or about the execution of the works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties and such person shall not be again employed upon the works without permission of the Engineer-in-charge.
29. **UNCOVERING AND MAKING GOOD:**
- The Contractor shall uncover any part of the works and/or make opening in or through the same as the Engineer-in-charge may from time to time direct for his verification and shall re-instate and make good such part to the satisfaction of the Engineer-in-charge. If any such part has been covered up or put out of view after being approved by the Engineer-in-Charge and subsequently found on uncovering to be executed in accordance with the Contract, the expenses of uncovering and/or making opening or through reinstating and making good the same shall be borne by the Contractor.
30. **WORKING DURING NIGHT OR ON SUNDAYS AND HOLIDAYS**
- Subject to any provisions to the contrary contained in the Contract none of the permanent works shall be carried out during night or on Sundays or on \_authorized holidays without the permission in writing of the Engineer-in-Charge except when the work is unavoidable or absolutely necessary for the safety of life, property or



works in which case the Contractor shall immediately advise the Engineer-in-charge accordingly.

**31.1 COMPLETION CERTIFICATE:**

As soon as the work is complete, the Contractor shall give notice of such completion to the Engineer-in-charge and within ten days of receipt of such notice the Engineer-in-charge shall inspect the work and shall furnish the Contractor with a certificate of completion indicating (a) the date of completion, (b) defects to be rectified by the Contractor and/or (c) items for which payment shall be made at reduced rates. When separate periods of completion have been specified for items or groups of item the Engineer-in-Charge shall issue separate completion certificates for such items or group of items. No certificate of completion shall be issued, nor shall the work be considered to be complete till the Contractor shall have removed from the premises on which the work has been executed all scaffolding, sheds and surplus materials, except such as are required for rectification of defects, rubbish and all huts and sanitary arrangements required for his workmen on the site in connection with the execution of the work, as shall have been erected by the Contractor, the workmen and cleaned all dirt from all parts of building(s), in upon or about which the work has been executed or of which the work has been executed or of which he may have had possession for the purpose of the execution thereof and cleaned floors, gutters and drains, eased doors and sashes oiled locks and fastenings \_uthori keys clearly and handed them over to the Engineer-in-Charge or his representative and made the whole premises fit for immediate occupation or use to the satisfaction of the Engineer-in-charge. If the Contractor shall fail to comply with any of the requirements of this conditions as aforesaid, on or before the date of completion of the works, the Engineer-in-charge may at the expense of the Contractor fulfil such requirements and dispose of the scaffoldings, surplus materials, and rubbish etc. as he thinks fit and the Contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually \_uthoriz by the sale thereof less the cost of fulfilling the requirements and any other amount that may be due from the Contractor, if the expense of fulfilling such requirements is more than the amount \_uthoriz on such disposal as aforesaid the Contractor shall forthwith on demand pay such excess.

31.2 If at any time before completion of the work, items or groups of items for which separate periods of completion have been specified, have been completed the Engineer-in-charge with the consent of the Contractor takes possession of any part of the same (any such parts being hereinafter in this conditions referred to as the relevant part) then not withstanding any thing expressed or implied elsewhere in this Contract.

31.2 (a) Within ten days of the date of completion of such items or group of items or of possession of the relevant part the Engineer-in-charge shall issue completion



certificate for the relevant part as in conditions 31(1) as above provided the Contractor fulfils his obligations under that condition for the relevant part.

- (b) The Defects Liability Period in respect of such items and the relevant part shall be deemed to have commenced from the certified date of completion of such items or the relevant part as the case may be.
- I The Contractor may reduce the value insured to extent of full value of the completed items or relevant part as estimated by the Engineer-in-charge for this purpose. This estimate shall be applicable for this purpose only and for no other.
- (d) For the purpose of ascertaining compensation for delay in completion of the work relevant part will be deemed to form a separate item or group, with date of completion as given in the Contract or as extended under the relevant condition and actual date of completion as certified by the Engineer-in-charge under this condition.

### **32 .COMPENSATION FOR DELAY**

If the Contractor fails to maintain the required progress in terms of the condition of this Contract or to complete the work and clear the site on or before the Contract or extended date/period of completion, he shall, without prejudice to any other right or remedy of the Corporation on account of such breach, part as agreed compensation amount calculated as stipulated below or such smaller amount as the Contract value of the work for every week that the progress remains below that specified or that the work remains incomplete.

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

For this purpose the term 'Contract Value' shall be the value at Contract rates of the work as ordered.

(a)	Completion Period (as originally stipulated) not exceeding 6 months	@ 1% per week
(b)	Completion period (as originally stipulated) exceeding 6 months and not exceeding 2 years	@ 0.5% per week

32.1 Provided always that the total amount of compensation for delays to be under this condition shall not exceed the under noted percentage of the Contract value of the item or group of items of work for which a separate period of completion is given



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**(A Government of India Enterprise)**  
(CIN : U 12000 JH 1967 GOI 000806)  
**TURAMDIH MILL**

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(a)	Completion Period (as originally stipulated) not exceeding 6 months	@ 10 percent
(b)	Completion Period (as originally stipulated) exceeding 6 months and not exceeding 2 years	@ 7.5 percent
(c)	Completion period (as originally stipulated) exceeding 2 years	@ 5 percent

32.2 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 Corporation.

**33. DEFECTS LIABILITY PERIOD**

The Contractor shall be responsible to make good and remedy at his own expense within such period as may be stipulated by the Engineer-in-charge, any defect which may develop or may be noticed before the expiry of the period mentioned in Schedule – F hereto from the certified date of completion and intimation of which has been sent to the Contractor within seven days of the expiry of the said period by a letter sent by hand delivery or by registered post.

34. From commencement to completion of the works, the Contractor shall take full responsibility for the care thereof and for taking precautions to prevent loss or damage and to minimize loss or damage to the greatest extent possible and shall be liable for any damage or loss that may occur to the works or any part thereof and all Government T & P from any cause whatsoever (save and except the Excepted Risks) and shall at his own cost repair and make good the same so that at completion of the work, Corporation's T & P shall be in good order and condition and in conformity in every respect with the requirements of the Contract and instruction of the Engineer-in-charge.

34.1 Provided always that the Contractor shall not be entitled to payment unless the Contractor shall insure the works (from commencement to completion), the Corporation's T & P hired by the Contractor and all materials at site to their full value (as to Corporation's T & P according to the value indicated in Schedule-C), against the risk or damage from whatever cause arising other than the Excepted Risks. The said insurance shall be in joint name of the Corporation and the Contractor, The Contractor shall deposit with the Engineer-in-charge the said policy or policies. All money payable by the insurers under such policy or policies shall be recovered by the Corporation and shall be paid to the Contractor in instalments by the Engineer-in-charge for the purpose of re-building or replacement or repairs of the works and/or goods destroyed or damaged as the case may be. Provided however if the amount payable by the insurers in respect of any claim under such a policy is not in excess of the amount mentioned in Schedule – F the same may be recovered by the Contractor directly from the insurers and shall be authorized by him for the purpose of re-building or replacement or repairs of the works and/or goods destroyed or damaged as the case may be.



- 34.2 If the Contractor has blanket insurance policy for all his works and the policy covers all the items to be insured under this condition, the said policy shall be assigned by the Contractor in favour of the Corporation, provided however, if any amount is payable under the policy by the insurers in respect of works other than the work under this Contract, the same may be recovered by the Contractor directly from the insurers.
- 34.3 Where the Corporation building or a part thereof is rented by the Contractor he shall insure the entire building if the building or any part thereof is used by him for the purpose of storing or using materials of combustible nature, as to which the decision of the Engineer-in-Charge shall be final and binding.
- 34.4 The Contractor shall indemnify and keep indemnified the Corporation against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance of works and against all Claims, demands, proceedings, damages, cost of charge and expenses whatsoever in respect of or in relation thereto provided always that nothing herein contained shall be deemed to render the Contractor liable for or in respect of or to indemnify the Corporation against any compensation or damage caused by the Excepted Risks.
- 34.5 The Contractor shall at all times Indemnify the Corporation against all claims, damages, or compensation under the provisions of payment of wages Act – 1936, Minimum Wages Act – 1948, Employer's Liability act – 1938, The workmen's Compensation Act – 1923, Industrial Disputes Act – 1947, and Maternity Benefit Act – 1961 or any modifications thereof or any other law relating thereto and rules made there under from time to time or as consequence of any accident or injury to any workmen or other persons in or about the works, whether in the employment of the Contractor or not, (save and except where such accident or injury has resulted from any act of the Corporation, it's agents or servants) and against all cost, charges and expenses of any suit action or proceedings arising out of such accident or injury and against all sum or sums which may with the consent of the Contractor be paid to compromise or compound any such claim, without limiting his obligations and liabilities as above provided. The Contractor shall insure against all claims, damages or compensation payable under the Workmen's Compensation Act – 1923 or any modification thereof or any other Law relating thereto.
- 34.6 The aforesaid insurance policy/policies shall provide that they shall not be cancelled till the Engineer-in-charge has agreed to there
- 34.7 The Contractor shall prove to the Engineer-in-charge from time to time that he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defect Liability Period, if any.





34.8 The Contractor shall ensure that similar insurance policies are taken out by his Sub-Contractors (if any) and shall be responsible for any claims or losses to the Corporation resulting from their failure to obtain adequate insurance protection in connection thereof. The Contractor shall produce or cause to be produced by his Sub-Contractors (if any) as the case may be, the relevant policy or policies and premium receipts as and when required by the Engineer-in-charge.

34.9 If the Contractor and/or his Sub-Contractor (if any) shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the terms of the Contract, then and in any such case the Corporation may, without being bound to, effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Corporation from any money due or which may become due to the Contractor or recover the same as debt due from the Contractor.

35. **FACILITIES TO OTHER CONTRACTORS:**

The Contractor shall, in accordance with requirement of the Engineer-in-charge, afford all reasonable facilities to other Contractors engaged contemporaneously on separate Contracts in connection with the works and for departmental labour and labour of any other properly authorized authority or statutory body which may be employed at the site on execution on any work not included in the Contract or of any Contract which the Corporation may enter into the connection with or ancillary to the works.

36. **NOTICES TO LOCAL BODIES**

The Contractor shall comply with and give all notices required under any governmental authority, instrument, rule or order made under any act of parliament, state laws or any regulation or bye-laws of any local authorities relating to the works. He shall before making any variation from the Contract, drawings necessitated by such compliance give to the Engineer-in-charge a written notice giving reasons for the proposed variation and obtain the Engineer-in-charge's instructions thereon.

36.1 The Contractor shall pay and indemnify the Corporation against any liability in respect of any fees or charges payable under any Act of parliament, state laws or any Government instrument, rule or order and any regulations or by-laws of any local authority in respect of the works.

37. **SUB CONTRACTS**

The Contractor shall not sublet any portion of the Contract without the prior written approval of the Accepting authority.



**38. INSTRUCTIONS AND NOTICES**

Subject as otherwise provided in this Contract, all notices to be given on behalf of the Corporation and all other actions to be taken on its behalf may be given or taken by Engineer-in-charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-charge.

- 38.1 All instructions, notices and communications etc. under the Contract shall be given in writing and if sent by registered post to the last known place of above or business of the Contractor shall be deemed to have been served on the date when in the ordinary course of post these would have been delivered to him.
- 38.2 The Contractor or his agent shall be in attendance at the site/ sites during all working hours and shall superintend the execution of the works with such additional assistance in each trade as the Engineer-in-charge may consider necessary. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to himself.
- 38.3 The Engineer-in-charge shall communicate or confirm his instructions to the Contractor in respect of the execution of work in a "Work site order Book" maintained in the office of the Engineer-in-charge and the Contractor or his authorized representative shall confirm receipt of such instruction by the Contractor, he shall be furnished a certified true copy of such instructions.
39. **FORE CLOSURE OF CONTRACT IN FULL OR IN PART DUE TO ABANDONMENT OR REDUCTION IN SCOPE OF WORK:**

If at any time after acceptance of the tender, the Corporation shall decide to abandon or reduce the scope of the works for any reason, whatsoever hence not require the whole or any part of the work to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the Contractor and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage or which he might have derived from the execution of the works in full, which he did not derive in consequence of the fore closure of the whole or part of the works.

- 39.1 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 authorized on the work to the full extent because of the foreclosure.
- (a) 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.



- (b) i) The Corporation 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, the Corporation 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 the Corporation, cost of such materials 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.
  - ii) For Contractor's materials not retained by the Corporation, reasonable cost of transportation of such materials from site to Contractor's permanent stores or to his other works, whichever is less. If materials are not transported to either of the said places, no cost of transportation shall be payable.
  - I If any materials supplied by the Corporation are rendered surplus, the same except normal wastage shall be returned by the Contractor to the Corporation 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 the Corporation stores if so required by the Corporation.
31. Reasonable compensation for transfer of T & P from site to Contractor's permanent stores or to his other works, which ever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.

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

**40. TERMINATION OF CONTRACT FOR DEATH:**

If the Contractor is an individual or a proprietary concern and the individual or the proprietary dies and if the Contractor is a partnership in concern and one of the partners dies, then unless the Accepting Authority is satisfied that the legal representative of the individual Contractor or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and complete the Contract, the Accepting Authority shall be entitled to cancel the Contract as to its incomplete part without the Corporation being in any way liable to payment of any compensation to the estate of the deceased Contractor and/or to the surviving partners of the Contractors firm on account of the cancellation of the Contract. The decision of the Accepting authority that the



legal representatives of the deceased Contractor or the surviving partners of the Contractor's firm cannot carry out and complete the Contract shall be final and binding on the partners. In the event of such cancellation the Corporation shall not hold the estate of the deceased Contractor and/or the surviving partners of the Contractor's firm liable in damages for not completing the Contract.

**41. CANCELLATION OF CONTRACT IN FULL OR IN PART:**

If the Contractor:

- a) At any time makes default in proceeding with the works with due diligence and continued to do so after a notice in writing of 7 days from the Engineer-in-charge or
- b) Commits default the works or items of work with individual dates of completion, and does not complete them within the period specified in notice given in writing in that behalf by the Engineer-in-charge.
- c) Fail to complete the works or items of work with individual dates of completion, and does not complete them within the period specified in notice given in writing in that behalf by the Engineer-in-charge.
- d) Shall offer or give or agree to give to any person in Corporation's service or to any other person on his behalf consideration, any gift or of any kinds as an inducements or reward for doing or forbearing to or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the Corporation.
- e) Shall enter into a Contract with the Corporation 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 terms of payment thereof have previously been disclosed in writing to the Accepting Engineer-in-charge.
- f) Shall obtain a Contract with the Corporation as a reward offering tendering or by other non – bonafied methods of competitive tendering or
- g) Being an individual, or if a firm any partner thereof, shall at any time be adjusted insolvent or have a receivers order for administration of his estate, made against him or shall take any proceeding, 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 purpose so to do, or if any application be made under any Insolvency Act for the time being in force for sequestration of his estate or if a trust deed be executed by him for



benefit of his creditor, shall be given to the Contractor for value of the work executed by him up to the time of cancellation, the value of Contractor's materials taken over and incorporated in the work, and use of tackle and machinery belonging the Contractor work or

- h) Being a Corporation, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a Receiver or Manager on behalf of the debenture holders shall be appointed or a circumstance shall arise which entitle the court or debenture holders to appoint a Receiver or Manager or
- i) Shall suffer an execution being levied on his goods and allow to be contained for a period of 21 days or
- j) Assigns, transfers, sublets(engagement of labour on a piece basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or attempts to transfer or sublet the entire works or any portion thereof, without the prior written approval of the Accepting Authority.  
The Accepting Authority may, without prejudice to any other right to remedy, which shall have accrued or shall accrue thereafter, the Corporation by written notice cancel the Contract as a whole or only such items of work on default from the Contract.

41.1 The Accepting authority shall on such cancellation have power to

- (a) Take possession of the site and any materials, constructional plant, implements, stores etc. thereon, and/or
- (b) Carryout the incomplete work by any means at the risk and cost of the Contractor.

41.2 On cancellation of the Contract in full or in part, the Engineer-in-Charge shall determine what amount, if any, is recoverable from the Contractor for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss or damage suffered by the Corporation. In determining the amount, credit shall be given to the Contractor for the value of the work executed by the Contractor upto the time of cancellation, the value of Contractor's materials taken over and incorporated in the work, and use of tackle and machinery belonging to the Contractor.

41.3 Any excess expenditure incurred or to be incurred by the Corporation in completing the works or part of the works or the excess loss or damages suffered or may be suffered by the Corporation as aforesaid after allowing such credit shall be recovered from any moneys due to the Contractor on any account, and if such



moneys are not sufficient the Contractor shall be called upon in writing to pay same within 30 days.

If the Contractor shall fail 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 etc. and apply the proceeds of sale thereof, towards the satisfaction of any sums due from the Contractor under the Contract and if thereafter there be any balance outstanding from the Contractor, it shall be recovered in accordance with the provisions of the Contract.

- 41.4 Any sums in excess of the amounts due to the Corporation and unsold materials, constructional plant etc. shall returned to the Contractor, provided always that if cost or anticipated cost of completion by the Corporation of the works is less than the amount which the Contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the Contractor.

**42. LIABILITY FOR DAMAGE/DEFECTS OR IMPERFECTIONS AND RECTIFICATION THEREOF:**

If the Contractor or his workmen or employees shall injure or destroy any part of the building in which they may be working or any building, road, fence etc. contiguous to the premises on which the work or any part of it is being executed or if any damage shall happen to the work while in that progress, the Contractor shall upon receipt of a notice in writing in that behalf make the same good at his own expense. If it shall appear to the Engineer-in-charge or his representative at any time during construction or re-construction or prior to the expiration of the Defects Liability Period, that any works has been executed with unsound, imperfect or unskillful workmanship or that any materials are of a inferior quality to that Contract for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other fault have appeared in the work arising out of defective or improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-Charge, 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 and/or remove the materials or articles at his own expense notwithstanding that the same may have been to do so within the period to be specified by the Engineer-in-charge, may rectify or remove and re-execute the work and or remove and replace with other materials or articles complained of, as the case may be, by other means at the risk and expense of the Contractor.

- 42.1 In case of repairs and maintenance works, splashes and droppings from white washing, painting, etc. shall be removed and surface cleaned simultaneously with completion of these items of work in individual rooms, quarters or premises etc. where the work is done, without waiting for completion of all other items of work in the Contract. In case the Contractor fails to comply with the requirements of this condition, the Engineer-in-charge shall have the right to get the work done by



other means at the cost of the Contractor. Before taking such action, however, the Engineer-in-charge shall give three days notice in writing to Contractor.

**43. URGENT WORKS:**

If any urgent work (in respect whereof the decision of the Engineer-in-Charge shall be final and binding) becomes necessary and the Contractor unable or unwilling at once to carry it out, the Engineer-in-Charge may by his own or other work people carry it out as he may consider necessary. If the urgent work were such as the Contractor is liable under the Contract to carry out at his expense, all expenses incurred on it by the Corporation shall be recoverable from the Contractor and be adjusted or set off against any sum payable to him.

**44. CHANGE IN CONSTITUTION:**

Where the Contractor is a partnership firm, prior approval in writing of the accepting authority shall be obtained before any change is made to 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 work hereby undertaken by the Contractor. If prior approval as aforesaid is not obtained, the Contract shall be deemed to have been assigned in contravention of condition 41(j) hereof and the same action may be taken and the same consequences shall ensue as provided for in the said condition 41.

**45. TRAINING OF APPRENTICES**

The Contractor shall during the currency of the Contract, when called upon by the Engineer-in-charge engage and also ensure engagement by Sub-Contractors and others employed by the Contractor in connection with the works, such number of apprentices in the categories as directed by E.I.C. and for such periods as may be required by the Engineer-in-charge. The Contractor shall train them as required under the Apprentices Act, 1961 and shall be responsible for all obligations, the employer under the Act including the liability to make payment of apprentices as required under the act.

**46. VALUATIONS AND PAYMENT:**

**RECORDS AND MEASUREMENT:**

The Engineer-in-charge, shall except as otherwise stated ascertain and determine the value of the works done in accordance with the measurement recorded and the Contract rates for each such items of work.



- 46.1 All items having a financial value shall be entered in Measurement Book, Level Book etc. prescribed by the Corporation so that a complete record is obtained of all work performed under the Contract.
- 46.2 Measurements shall be taken jointly by the Engineer-in-charge or his \_authorized representative and by the Contractor or his \_authorized representative.
- 46.3 Before taking measurements of any work, the Engineer-in-charge or the persons deputed by him for the purpose shall give a reasonable notice to the Contractor. If the Contractor fails to attend or send an \_authorized representative for measurement after such a notice or fails to countersign or to record the objection within a week from the date of measurement, then in any such event, measurements taken by the Engineer-in-charge or by person deputed by him shall be taken to be correct measurements of the work.
- 46.4 The Contractor shall, without extra charge, provide assistance with every appliance, labour and other things necessary for measurement.
- 46.5 Measurement shall be signed and dated by both parties each day on the site on completion of measurement. If the Contractor objects to any of the measurements recorded on behalf of the Corporation, a note to that effect shall be made in the Measurement Book against the item objected to and such note shall be signed and dated by both parties engaged in taking measurements.
- 46.6 Where mode of measurement is not otherwise specified, the measurement shall be taken at site as per the latest I.S. Code of practice at the time of tendering.

**47. METHOD OF MEASUREMENTS:**

Except where any general or detailed description of the work in quantities expressly shows to the contrary, Schedule of Quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure set forth in the Schedule of Rates/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 the Schedule of Rates/Specifications, measurements shall be taken in accordance with the relevant Standard Method of Measurement issued by the Indian Standard Institution.

**48. PAYMENT ON ACCOUNT:**

Interim bills shall be submitted by the Contractors at intervals mentioned in Schedule – F on or before the date fixed by the Engineer-in-charge for the work executed. The Engineer-in-charge shall then arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work.





- 48.1 Payment on account for amount admissible shall be made on the Engineer-in-charge certifying the sum to which the Contractor is considered entitled by way of interim payment for all work executed after deducting there from the accounts already paid, the security deposit and such other amounts as may be deductible or recoverable in terms of the Contract.
- 48.2 Any interim certificate given relating to work done or materials supplied may be modified or corrected by any subsequent interim certificate or by the final certificate. No certificate of the Engineer-in-charge supporting an interim payment shall of itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the Contract.
- 48.3 Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided.

**49. TIME LIMIT FOR PAYMENT OF FINAL BILL**

The Contractor shall submit the Final Bill within three months of physical completion of the works. The Contractor shall make no further claims after submission of the bill (final) and these shall be deemed to have been waived and extinguished. Payment of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and at rates as approved by Engineer-in-charge, shall be made within the period specified hereunder, the period being reckoned from the date of receipt of the bill by the Engineer-in-charge.

- a) Contract amount not exceeding Rs. 5 Lakhs ..... Four months
- b) Contract amount exceeding Rs. 5 Lakhs ..... Six months

31. After payment of the amount of the final bill payable as aforesaid has been made, the Contractor may, if he so desires, reconsider his position in respect of the disputed portion of the final bill and if he fails to do so within 90 days his disputed claim shall be dealt with as provided in the Contract, provided however, no reimbursement or refund shall be made if the increase/decrease is not more than + 10% of the said price, and if so the reimbursement or refund shall be made only on the excess over + 10% provided that any increase will not be payable if such increase has become operative after the Contract extended date of completion of the works or items of work in question.

**51. OVER PAYMENTS AND UNDER PAYMENTS**

Whenever any claim for the payment of a sum of money to the Corporation arises out of or under this Contract against the Contractor, the same may be deducted



by the Corporation from any sum then due or which at any time thereafter may become due to the Contractor under this Contract and failing that, under any other Contract with the Corporation (which may be available with the Corporation) or from his security deposits or he shall pay the claim on demand.

- 51.1 The Corporation reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc. The Corporation further reserves the right to enforce recovery of any over payment when detected, notwithstanding the fact that amount of the final bill may be included by one of the parties as an item of dispute before an arbitrator appointed under condition 52 of this Contract and notwithstanding the fact that the amount of the final bill figures the arbitration award.
- 51.2 If as a result of such audit and technical examination any over payment discovered in respect of any work done by the Contractor or alleged to have been done by him under the Contract, it shall be recovered by the Corporation from the Contractor by any or all of the methods prescribed above or if any under payment is discovered, the amount shall be duly paid to the Contractor by the Corporation.
- 51.3 Provided that the aforesaid right of the Corporation to adjust over payment against amounts due to the Contractor under any other Contract with the Corporation shall not extend beyond the period of two years from the date of payment of the final bill or in case the final bill is a Minus bill, from the date the amount payable by the Contractor under the minus final bill is communicated to the Contractor.
- 51.4 Any amount due to the Contractor under this Contract for under payment may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the Contractor, from him to the Corporation on any other Contract or amount whatsoever.

#### **ARBITRATION:**

Except where otherwise provided for in the Contract, all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions herein 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 completion or abandonment thereof, shall be referred to the sole arbitration of the Chairman & Managing Director of Uranium Corporation of India Limited, Jaduguda and if the Chairman and Managing Director is unable or unwilling to act to the sole arbitration, of some other person appointed by the Chairman & Managing Director, willing to act as



such arbitrator. There will be no objection if the arbitrator so appointed is an employee of Uranium Corporation of India Limited, Jaduguda and that he had to deal with the matters to which the Contract relates and that in the course of his duties as such he had expressed views on all or any of the matters in dispute or difference. The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reasons, such Chairman & Managing Director as aforesaid at the transfer, vacation of the office of inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the Contract. Such person shall be entitled to proceed with the reference from the stage at which his predecessor left it. It is also a terms of this Contract that no person other than a person appointed by such Chairman & Managing Director, as aforesaid should act as arbitrator and if for any reason, that is not possible, the matter is not to be referred to arbitration at all. In all cases where the amount of the claim in dispute is Rs. 50,000/-(Rupees Fifty Thousand) and above, the arbitrator shall give reasons for the award.

Subject as aforesaid, the provisions of the Arbitration Act, 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force, shall apply the arbitration proceeding under this clause. It is a term of the Contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under the clause together with the amount for amounts claimed in respect of each such dispute.

It is also a term of the Contract that if the Contractor does not make any demand for arbitration in respect of any claim(s) in writing within 90 days of receiving the intimation from the Corporation that the bill is ready for acceptance of the Contractor, the claim of the Contractor will be deemed to have been waived and absolutely barred and the company shall be discharged and released of all liabilities under the Contract in respect of these claims.

The arbitrator(s) may from time to time with consent of the parties enlarge the time, for making and publishing the award.

The decision of the Engineer-in-charge regarding the quantum of reduction as well as justification thereof in respect of rates for substandard work, which may be decided to be accepted, will be final and would not be open to arbitration. The arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing.

The venue of Arbitration shall be such place as may be fixed by the Arbitrator, in his sole discretion. The award of the Arbitrator shall be final, conclusive and binding all the parties to this Contract.

## **52.2 COST OF ARBITRATION**



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Upon every or any such reference, the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client, or as between party and party and shall direct by whom and to whom and in what manner the same shall be borne and paid.

### **52.3 WORK TO CONTINUE**

Work under the Contract shall be continued by the Contractor during the arbitration proceedings, unless otherwise directed in writing by the Corporation or the Engineer-in-charge or unless the matter is such that the works cannot possibly be continued until the decision of the arbitrator is obtained and except as those which are otherwise expressly provided in the Contract, no payment due or payable by the Corporation shall be withheld on account of such arbitration proceeding unless it is the subject matter or one of the subject matters of the arbitration.

### **53LAWS GOVERNING THE CONTRACT:**

This Contract shall be governed by the Indian Laws for the time being in force and it shall be deemed to have been executed at Jaduguda, District Singhbhum(East), Jharkhand within the ordinary Civil Jurisdiction of the Competent courts in the district of Singhbhum(East).

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## **SECTION – VI**

### **SPECIAL CONDITION**



### **SPECIAL CONDITIONS**

#### **SITE INVESTIGATION:**

1. The Tenderers are advised to visit the site to acquaint themselves as to the nature and location of the work, the general and local conditions particularly those bearing upon transportation, disposal handling and storage of materials, availability of labour, water or similar physical conditions of the site, the formation and conditions and level of the ground the character quality and quality of surface and sub-surface materials to be encountered, including sub-soil 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 of in any way affect the work the cost thereof under the contract.

#### **2. STORES TO BE SUPPLIED:**

NIL

3. 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 arrangements for Labourers Security will have to be made by the Contractor at his own cost.

#### **4. SALES TAX**

Sales Tax/Works Tax as per rules shall be recovered at source on gross value of the work executed and the contractor directly to sales Tax authority shall deposit balance amount on this account.

5. Final Bills will not be entertained unless the same is accompanied by Royalty clearance certificate issued by the Office of District Mining Officer, Jamshedpur for consumption of minor minerals in this work.

6. All work shall, unless specified otherwise, confirmed to the latest revision of relevant IS/CPWD Specifications and codes of practice. In case of any particular aspect not specifically covered the standards the standard practice as may be specified by Engineer shall be final & binding.

#### **7. MODE OF MEASUREMENT**

As per IS / CPWD specification unless otherwise stated in Schedule of quantities .

#### **8. PLANT AND MACHINERY TO BE ARRANGED BY CONTRACTOR**

Contractor shall at his own expenses provide equipment and machinery for this work. UCIL shall not issue any plant and machinery for this work.

#### **9. CONTRACTOR'S SUPERINTENDENCE**

The contractor shall employ one or more competent and qualified experience persons and supervisors whose names shall have to be communicated in writing to the Engineer-in-charge by the contractor at the site of work during all working hours and any orders or instructions which



the Engineer-in-charge / Engineer's representative may give to the said representative of the contractor, shall be deemed to have been given to the contractor.

10. Rates for altered/ substituted/ extra items of work may be decided by any one of the method in the chronological order tailed hereunder:

- i. Nearest similar item of work available in the bill of quantities of the particular contract.
- ii. If not covered in Bill of quantities, but covered in CPWD-DSR-2007 rate shall be DSR-2007 rate plus/ minus percentage of contract value over the estimated cost.
- iii. If not covered in CPWD-DSR-2007 the rate shall be market rate and labour with 15% extra to cover for overhead and profit.

11. Cement and Reinforcement bars required for construction of contractor's hutments, stores, go down and site office shall be arranged by the contractor at their own cost.

12. In case of stoppage of work by local people/ Band or any other reasons no idle changes will be paid by corporation towards Labour, plant and Machinery etc. to the contractor for this work

13. No any carriage/transportation for any material shall be paid by the department for this work. Contractor should quote their rates accordingly.

14. Unless specifically mentioned otherwise in the contract the tenderer shall quote for the finished items and shall provide for the complete cost towards labour materials, erection and dismantling of necessary scaffolding, levies all taxes, royalty, transport, storage, repairs, rectification, maintenance till handing over, revenue expenses, contingencies overheads profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to contract.

15. All the labour rules shall be followed strictly as per contract labour (Regulation & Abolition) Act, 1970. All registers, forms stipulated under minimum wages Act should be maintained by the contractor and to be furnished to the corporation before commencement of the work. In case of non-submission of above registers/forms to the corporation regularly contractor will not be allowed to continue to do the work. In the event of the breach of aforesaid conditions, the contractor shall be open for action as deemed fit by the concerned labour authorities of the State/Central government.

16. In case payment of laborers engaged for this work has not been made on stipulated payment Day Corporation shall compel the contractor to stop the work and necessary action will be taken.

17. Necessary workmen insurance coverage and Labour licence for **30 Nos** workmen (Minimum) shall be obtained by the contractor for the workmen engaged at site for this work at their own cost for the whole period of the contract and shall be furnished to the Corporation.



18. Contractor shall have to provide the facilities under the provision of Contract Labour (Regulation & Abolition) Act, 1970 – Section – 16, 17, 18 and 19, Chapter – V – “Welfare and Health of Contract Labour”.

19. Quantity of item may vary to any extent and be excluded altogether. Contractors will carryout all works up to a total variation of( + ) / ( - ) 15% (Fifteen ) on the contract price and all quoted rates shall remain firm within this limit.

20. Any grass / jungle stripping, cutting of bushes and removal of minor natural obstructions on the way of excavation/other work will be carried out by the Contractor at no extra cost to Corporation and the rate of the works will include all this elements.

**21. No escalation on any account whatsoever shall be paid by corporation for this work.**

22. Contractors shall strictly abide by the security rules and regulations enforced by the owner time to time. The contractor shall provide proper identity cards, badges , etc. to his employees wherever directed by the engineer.

23. MEDICAL CARE: The contractor shall be fully responsible for any first aid and emergency medical treatment to his employees. The contractor at the site shall make necessary arrangement for this purpose. In serious cases medical facilities of UCIL may be available on chargeable basis. Contractor have to submit medical fitness certificate of all workmen engaged at site.

24. MEDICAL SUPERVISION:

The medical supervision of the contractor over his employees shall include anti-malaria measures, vaccination against small pox, inoculations against cholera, typhoid fever and other infectious diseases. Employees suffering from infectious diseases shall be removed from the site as soon as detected. If any case of infectious disease be discovered among the employees it must at once be reported to the Engineer. The contractor shall abide by the provision of the Employees State Insurance Scheme where applicable.

25. The Engineer wherever appears in the contract shall mean Engineer-in-charge of the work.

26. All temporary diversion of roads / drains required to commence/ execute the job is to be done by the contractor at their own cost.

27. CONTRACTOR TO ASSIST IN MEASUREMENT:

The Engineer shall except as otherwise started ascertain and determines by measurement the value of work done in accordance with the contract. The contractor shall when require any part





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or parts of the work to be measured give not ice to the Engineer or the Engineer's representative in making such measurement and shall furnish all particulars required by either of them should the contractor not attend or neglect or omit to sent such agent then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of the works.

Except where any general or detail description of the works in the schedule of items expressly shows to the contrary all measurements shall be made according to the procedure set forth by the Engineer.

**28. Rates quoted by tenderers should be inclusive of all taxes including service tax.**

**Service Tax :**

**Total Service tax will be 4.944% of work order value. UCIL liability will be 50% under reverse mechanism system i.e. 50% ( 2.472% ) will be deducted from contractor's bill and deposited by UCIL directly and balance 50% will have to be deposited by contractor themselves. Service tax on free issue materials will be born by UCIL.**

**However, if the firm of successful contractor is limited / private limited company, there will be no deduction from bill of contractor because in such case UCIL has no liability under reverse charge mechanism.**

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## **SECTION – VII**

# **TECHNICAL SPECIFICATION**



**TECHNICAL SPECIFICATION  
FOR  
CEMENT CONCRETE (PLAIN & REINFORCED)**

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<b>CLAUSE NO.</b>	<b>DESCRIPTION</b>
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**TECHNICAL SPECIFICATION  
FOR  
CEMENT CONCRETE ( PLAIN & REINFORCED )**

**1.0 SCOPE**

**1.1 General**

This specification covers all the requirements, described hereinafter for general use of Plain and Reinforced Cement Concrete work in Structures and locations, cast-in-situ or precast, and shall include all incidental items of work not shown or specified but reasonably implied or necessary for the completion of the work.

1.2 This specification shall also apply to the extent it has been referred to or applicable with the special requirements of structures covered in SCOPE of IS:456.


1.3 IS:456 shall form a part of this specification and shall be complied with unless permitted otherwise. For any particular aspect not covered by this Code, appropriate IS Code, specifications and/or replacement by any International Code of practice as may be specified by the Engineer shall be followed. All codes and Standards shall conform to its latest revisions. A list of IS codes and Standards is enclosed hereinafter for reference.

**2.0 GENERAL**

**2.1 Work to be provided for by the Contractor**

The work to be provided for by the Contractor, unless otherwise specified shall include but not be limited to the following :-

- a) Furnish all labour, supervision, services including facilities as may be required under statutory labour regulations, materials, forms, templates, supports, scaffolds, approaches, aids, construction equipment, tools and plants, transportations, etc. required for the work.
- b) Except where it is excluded from the Scope of Contract, Contractor shall prepare progressively and submit for approval detailed drawings and Bar Bending Schedules for reinforcement bars showing the positions and details of spacers, supports, chairs, hangers etc.
- c) Design and prepare working drawings of formworks, scaffolds, supports, etc. and submit for approval.
- d) Submit for approval shop drawings for various inserts, anchors, anchor bolts, pipe sleeves, embedments, hangers, openings, frames etc.

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- e) Submit for approval detailed drawings of supports, templates, hangers, etc. required for installation of various embedment like inserts, anchor bolts, pipe sleeves, frames, joint seals, frames, openings etc.
- f) Submit for approval detailed schemes of all operations required for executing the work, e.g. Material handling, Concrete mixing, Placement of concrete, Compaction, curing, services, Approaches, etc.
- g) Design and submit for approval concrete mix designs required to be adopted on the job.
- h) Furnish samples and submit for approval results of tests of various properties of the following :-
  - i) The various ingredients of concrete
  - ii) Concrete
  - iii) Embedments
  - iv) Joint seals
- i) Provide all incidental items not shown or specified in particular but reasonably implied or necessary for successful completion of the work in accordance with the drawings and specifications.
- j) For supply of certain materials normally manufactured by specialist firms, the Contractor may have to produce, if directed by the Engineer, a guarantee in approved proforma for satisfactory performance for a reasonable period as may be specified, binding both the manufacturers and the Contractor, jointly and severally.

## 2.2 **Work by Others**


No work under this specification will be provided by any agency other than the Contractor unless specifically mentioned elsewhere in the contract.

## 2.3 **Information to be submitted by the Tenderer**

### 2.3.1 **With Tender**

The following technical information are required with the tender :

- a) Source and arrangement of processing of aggregates proposed to be adopted.
- b) Type of plant and equipment proposed to be used.

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- c) Names of firms, if any, with which association is sought for to execute the special items of work in the contract.
- d) Types of formwork proposed to be used.

### 2.3.2

#### **After Award**

The following information and data including samples where necessary, shall be submitted by the Contractor progressively during the execution of the contract.

- a) Programme of Execution and Requirement of Materials

The Contractor will submit a Master Programme for completion of the work giving monthwise requirements of materials for the procurement.


This Master Programme may have to be reviewed and updated by the Contractor, quarterly or at more frequent intervals as may be directed by the Engineer depending on the exigencies of the work.

Detailed day-to-day programme of every month is to be submitted by the Contractor before the end of the previous month.

- b) Samples

Samples of the following materials and any other materials proposed to be used, shall be submitted as directed by the Engineer, in sufficient quantities free of cost, for approval. Approved samples will be preserved by the Engineer for future reference. The approval of the Engineer shall not, in any way, relieve the Contractor of his responsibility of supplying materials of specified qualities :-

- i) Coarse and fine aggregates.
- ii) Admixtures.
- iii) Plywood for Formwork.
- iv) Embedded and anchorage materials as may be desired by the Engineer.
- v) Joint sealing strips and other waterproofing materials.
- vi) Joint filling compounds.
- vii) Foundation quality Rubber Pads.

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c) Design Mix

Design mix as per Clauses 2.1 (g) & 3.4 of this specification giving proportions of the ingredients, sources of aggregates and cement, along with accompanying test results of trial mixes as per relevant I.S., is to be submitted to the Engineer for his approval before it can be used on the works.

d) Detail Drawings and Bar Bending Schedules

Detailed working drawings and Bar Bending Schedules in accordance with Clause 2.1(b) and 3.16.1 of this specification.

e) Detailed Drawings and Designs of Formworks to be used

Detailed design data and drawings of standard formworks to be used as per clause 2.1 (c).

f) Detailed Drawings for Templates & Temporary Supports for Embedments

As per Clause 2.1 (e).

g) Mill Test Reports for Cement & Reinforcing Steel

h) Inspection Reports

Inspection Reports in respect of Formwork and Reinforcement and any other item of work as may be desired by the Engineer in accordance with Clause 2.4 of this specification.

i) Test Reports


Reports of tests of various materials and concrete as required under Clause 4.0: SAMPLING & TESTING of this specification.

j) Any other data which may be required as per this specification.

## 2.4

### Conformity with Design

The Contractor will prepare check lists in approved proforma which will be called 'Pour Cards'. These Pour Cards will list out all items of work involved. The Contractor will inform the Engineer, sufficiently in advance, whenever any particular pour is ready for concreting. He shall accord all necessary help and assistance to the Engineer for all checking required in the pour. On satisfying himself that all details are in accordance to the drawings and specifications, the Engineer will give written permission on the same 'Pour Card' allowing the Contractor to commence placement of concrete. Details of all instructions issued by the Engineer and the records of compliance by the Contractor, deviations allowed by the Engineer and any other relevant information will be written on

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accompanying sheets attached to the Pour Cards. These sheets, termed as 'Progress Cards', will be prepared by the Contractor on approved proforma. The Pour Cards along with accompaniments will be handed over to the Engineer before starting placement of concrete. One of the mix designs developed by the Contractor as per the I.S. Specifications and established to the satisfaction of the Engineer by trial mixes shall be permitted to be used by the Engineer, the choice being dictated by the requirements of designs and workability. The methods of mixing, conveyance, placement, vibration, finishing, curing, protection and testing of concrete will be as approved or directed by the Engineer.

## 2.5 **Materials to be used**

### 2.5.1 **General Requirement**

All materials whether to be incorporated in the work or used temporarily for the construction shall conform to the relevant IS Specifications unless stated otherwise and be of best approved quality.


### 2.5.2 **Cement**

Generally cement shall be 33 grade ordinary Portland Cement conforming to IS-269. In special cases any of the following type of cement may be permitted or directed to be used with prior approval by the Engineer :

- a) 43 Grade ordinary Portland Cement conforming to IS-8112
- b) 53 Grade ordinary Portland Cement conforming to IS-12269
- c) Rapid hardening Portland Cement conforming to IS-8041
- d) Portland slag cement conforming to IS-455
- e) Portland Pozzolona Cement (flyash based) Conforming to IS- 1489 (Part-1)
- f) Portland pozzolona Cement (calcined clay based) conforming to IS-1489 (Part-2)
- g) Hydrophobic Cement conforming to IS-8043
- h) Low heat Portland Cement conforming to IS : 12600
- i) Sulphate Resisting Portland Cement conforming to IS-12330

### 2.5.3 **Aggregate**

Aggregates shall be natural or crushed gravel or crushed rock and free from deleterious material. It shall comply with the requirements of IS-383.

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a) Coarse Aggregate

Aggregate of sizes ranging between 4.75 mm and 150 mm will be termed as Coarse Aggregate. Only Coarse Aggregate from approved quarries and conforming to IS:383 will be allowed to be used on the works. Aggregates shall be washed to make it free from deleterious materials, if necessary. The grading of coarse aggregates by sieve analysis shall be as per IS:383.

b) Fine Aggregate

Aggregate smaller than 4.75 mm and within the grading limits and other requirements set in IS:383 is termed as Fine Aggregate or Sand. Only Fine Aggregate from approved sources and conforming to the above IS Specification will be allowed to be used on works.

#### 2.5.4 Water

Water for use in concrete shall be clear and free from injurious oils, acids, alkalis, organic matter, salt, silts or other impurities. Normally potable water is found to be suitable. Generally, IS:3550 will be followed for routine tests. In case of doubt the acceptance test for water shall be as per IS:3025, and Table-1 of IS:456.

#### 2.5.5 Admixture

Only admixtures of approved quality will be used when directed or permitted by the Engineer. The different types of admixtures which may be necessary to satisfy the concrete mix and the design requirement shall be as per the following I.S. Standards :

IS : 2645        -        Integral cement water proofing compound


IS : 9103        -        Indian standard specification for Admixtures for Concrete or equivalent American Codes (ASTM C494 and ASTM C260) or British Codes ( BS 5075, Part 1 to 3 ) and may be one of the following :

a) Accelerating admixtures :

- Set accelerating admixtures like "Sigunit Powder" or "Sigunit LN10" or approved equivalent.

b) Retarding admixtures :

- Modified ligno sulphonate based set retarding concrete admixture like, "Plastiment R" or approved equivalent.

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- c) Water reducing admixtures :
  - Modified sulphonated melamine formaldehyde based water reducing concrete admixture like, "Sikament" or approved equivalent.
- d) Air entraining admixtures :
  - Modified ligno sulphonate based air entraining concrete admixture like "FLOMO AEP " or surface - active agents like "Sika AER" or approved equivalent.
- e) Water proofing admixtures :
  - Modified ligno-sulphonate based waterproofing admixture like "Plastocrete Super" or approved equivalent.

The Contractor shall furnish following technical information about the admixtures (alongwith the manufacturer's Catalogue) which he is planning to use in different areas within the scope of work for the approval of the Engineer :

- i) Type of admixture
- ii) Mix proportion & mode of application in concrete/mortar
- iii) Manufacturer's specification & necessary quality assurance certificates ( mainly on chloride & sulphate content, PH value, infra red analysis & solid content. )

#### 2.5.6 **Reinforcement**


Reinforcement shall be as per relevant IS Specification as mentioned in the Contract/Drawing/Instructions. All bars shall be of tested quality.

#### 2.6.0 **Storage of Materials**

##### 2.6.1 **General**

All materials shall be so stored as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work. Any material, which has deteriorated or has been damaged or is otherwise considered defective by the Engineer, shall not be used for concrete and shall be removed from site immediately, failing which, the Engineer shall be at liberty to get the materials removed and the cost incurred thereof shall be realised from the Contractor's dues. The Contractor shall maintain upto-date accounts of receipt, issue and balance (stackwise) of all materials. Storage of materials shall conform to IS:4082.



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#### 2.6.2 **Cement**

Sufficient space for storage, with open passages between stacks, shall be arranged by the Contractor to the satisfaction of the Engineer.

Cement shall be stored off the ground in dry, leak proof, well-ventillated ware-houses at the works in such a manner as to prevent deterioration due to moisture or intrusion of foreign matter.

Cement shall be stored in easily countable stacks with consignment identification marks. Consignments shall be used in the order of their receipts at site. Sub-standard or partly set cement shall not be used and shall be removed from the site, with the knowledge of the Engineer, as soon as it is detected.

Different types of cement shall be clearly marked for easy identification and different types of cement shall not be intermixed.

#### 2.6.3 **Aggregate**

Aggregates shall be stored on planks or steel plates or on concrete or masonry surface. Each size shall be kept separated with wooden or steel or concrete or masonry bulk-heads or in separate stacks and sufficient care shall be taken to prevent the material at the edges of the stock piles from getting intermixed. Stacks of fine and coarse aggregates shall be kept sufficiently apart with proper arrangement of drainage. The aggregates shall be stored in easily measurable stacks of suitable depths as may be directed by the Engineer.

#### 2.6.4 **Reinforcement**


Reinforcing steel shall be stored consignment-wise and sizewise off the ground and under cover, if desired by the Engineer. It shall be protected from rusting, oil, grease and distortions. If necessary, the reinforcing steel may be coated with cement wash before stacking to prevent scale and rust at no extra cost to the Owner. The stacks shall be easily measurable. Steel needed for immediate use shall only be removed from storage.

#### 2.7 **Quality Control**

Contractor shall establish and maintain quality control for different items of work and materials as may be directed by the Engineer to assure compliance with contract requirements and maintain and submit to the Engineer records of the same.


The quality control operation shall include but not be limited to the following items of work :-

- a) Admixture : Type, quantity, physical & chemical properties that affect strength, workability and durability of concrete.

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For air entraining admixtures, dosage to be adjusted to maintain air contents within desirable limits

- b) Aggregate : Physical, chemical & mineralogical qualities. Grading, moisture content and impurities.
- c) Water : Impurities tests.
- d) Cement : Tests to satisfy relevant IS Specifications (only association with Owner's tests, if the supply is made by Owner).
- e) Formwork : Material, shapes, dimensions, lines, elevations, surface finish, adequacy of form, ties, bracing and shoring and coating.
- f) Reinforcement : Shapes, dimensions, length of plices, clearances, ties and supports. Quality & requirement of welded splices.  
  
Material tests or certificates to satisfy relevant IS Specification (If Contractor's supply).
- g) Grades of concrete : Usage & mix design, testing of all properties.
- h) Batching & Mixing: Types and capacity of plant, concrete mixers and transportation equipment.
- i) Joints : Locations of joints, water stops and filler materials. Dimension of joints, quality and shape of joint material and splices.
- j) Embedded and  
Anchorage Items : Material, shape, location, setting.
- k) Placing : Preparation, rate of pouring, weather limitations, time intervals between mixing and placing and between two successive lifts, covering over dry or wet surfaces, cleaning and preparation of surfaces on which concrete is to be placed, application of mortar/slurry for proper bond, prevention of cold joint, types of chutes or conveyors.
- l) Compaction : Number of vibrators, their prime mover, frequency and amplitude of vibration, diameter and weight of vibrators, duration of vibration, hand-spreading, rodding & tamping.

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- m) Setting of base & : Lines, elevations and bedding mortar.  
Beaming plates
- n) Concrete Finishes : Repairs of surface defects, screening, floating, steel trowelling & brooming, special finishes.
- o) Curing : Methods and length of time.

Copies of records and tests for the items noted above, as well as, records of corrective action taken shall be submitted to the Engineer for approval as may be desired.

### 3.0 **INSTALLATION**

All installation requirements shall be in accordance with IS:456 and as supplemented or modified herein or by other best possible standards where the specific requirements mentioned in this section of the specification do not cover all the aspects to the full satisfaction of the Engineer.

#### 3.1 **Washing and Screening of Aggregates**

Washing and Screening of coarse aggregate shall be carried out to remove fines, dirt or other deleterious materials.

Washing of fine aggregate shall not be allowed, Fine aggregates shall be screened only to remove dirt or other deleterious materials.


However, all washing & screening of aggregates shall be carried out by approved means to ensure compliance with the aggregate specification.

#### 3.2 **Admixture**

All concrete shall be designed for normal rate of setting and hardening at normal temperature. Variations in temperature and humidity under different climatic conditions will affect the rate of setting and hardening, which will, in turn, affect the workability and quality of the concrete.

Admixtures may be permitted to be used in accordance with IS:456 to modify the rate of hardening, to improve workability or as an aid to control concrete quality. The Engineer reserves the right to require laboratory test or use test data, or other satisfactory reference before granting approval. The admixture shall be used strictly in accordance with the manufacturer's directions and/or as directed by the Engineer.

#### 3.3 **Grades of Concrete**

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Concrete shall be in any of the grades designated in IS:456. Grade of concrete to be used in different parts of work shall be as shown on the drawing or as per the Engineer's instructions. In case of liquid retaining structures, IS:3370 will be followed.

### 3.4 **Proportioning and Works Control**

#### 3.4.1 **General**

Proportioning of ingredients of concrete shall be made by any of the two following methods as directed by the Engineer.


- a) With preliminary tests by designing the concrete mix. Such concrete shall be called 'Design Mix Concrete'.
- b) Without preliminary tests adopting nominal concrete mix. Such concrete shall be called 'Nominal Mix Concrete'.

As far as possible, design mix concrete shall be used on all concrete works. Nominal mix concrete, in grades permitted in accordance with IS:456, may be used if shown on drawings or approved by the Engineer. In all cases the proportioning of ingredients and works control shall be in accordance with IS:456 and shall be adopted for use after the Engineer is satisfied regarding its adequacy and after obtaining his approval in writing.

#### 3.4.2 **Mix Design Criteria**

Concrete mixes will be designed by the Contractor to achieve the strength, durability and workability necessary for the job, by the most economical use of the various ingredients. In general, the design will keep in view the following considerations:-

- a) Consistent with the various other requirements of the mix, the quantity of water should be kept at the lowest possible level.
- b) The nominal maximum size of coarse aggregate shall be as large as possible within the limits specified.
- c) The various fractions of coarse and fine aggregates should be mixed in such a proportion as to produce the best possible combined internal grading giving the densest and most workable mix.
- d) Chemical admixtures may be used to modify the rate of hardening, to improve workability (maintaining low water - cement ratio) or as an aid to control concrete quality.
- e) The finished concrete should have adequate durability in all conditions, to withstand satisfactorily the weather and other destructive agencies which it is expected to be subjected to in actual service.

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The requirement of adequate structural strength is catered for by the choice of proper grade of concrete by the Engineer. The Contractor shall strictly abide by the same in his design of concrete mix.


Notwithstanding anything mentioned in various tables given in IS:456 giving specific values and degrees of workability for different condition of concrete placing, minimum cement content and maximum water-cement ratio for concrete exposed to sulphate attack and for concrete to ensure durability under different conditions of exposure, strength requirement for different grades of concrete, proportion for nominal mix concrete, the following tables in the specification are included. For identical condition if values given in the tables shown hereinbelow are different from those mentioned in IS:456, the values as indicated in the tables shown hereinbelow shall prevail.

Various trials shall be given by the contractor with specific cement content on each trial. In some cases, plasticizers and other admixtures may be necessary to achieve the desired results.

**TABLE - I**

**STRENGTH REQUIREMENT OF CONCRETE**

Grade of concrete	Specified Characteristic Compressive strength of 15cm Cubes at 28 days conducted in accordance with IS:516 (All values in N/Sq.mm)
M - 10	10
M - 15	15
M - 20	20
M - 25	25
M - 30	30
M - 35	35
M - 40	40

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Note -1: Nominal mix concrete of proportions 1:4:8 or 1:3:6 may be used as lean concrete for simple foundations for masonry walls, below the reinforced concrete foundations and mass filling. These mixes need not be designed.

Note-2: Grades of concrete leaner than M-20 shall not be used in reinforced concrete.


**TABLE - II**

**MIX PROPORTIONS (BY WEIGHT) EXPECTED TO GIVE DIFFERENT DEGREES OF WORKABILITY WITH DIFFERENT VALUES OF WATER -CEMENT RATIO**

**(FOR GUIDANCE)**

**CEMENT/TOTAL AGGREGATE RATIOS**

WORKABILITY	WATER/ CEMENT RATIO	RATIO BY WEIGHT OF CEMENT OF GRAVEL AGGREGATE		RATIO BY WEIGHT OF CEMENT TO CRUSHED STONE AGGREGATE	
		20 mm size	38 mm size	20 mm size	38 mm size
Very low	0.4	1:4.8	1:5.3	1:4.5	1:5.0
Slump	0.5	1:7.2	1:7.7	1:6.5	1:7.4
0-25 mm	0.6	1:9.4	1:10	1:7.8	1:9.6
	0.7	1:10	1:12	1:8.7	1:10.6
Low	0.4	1:3.9	1:4.5	1:3.5	1:4.0
Slump	0.5	1:5.5	1:6.7	1:5.0	1:5.5
25-50 mm	0.6	1:6.8	1:7.4	1:6.3	1:7.0
	0.7	1:8.0	1:8.5	1:7.4	1:8.0
Medium	0.4	1:3.5	1:3.8	1:3.1	1:3.6
Slump	0.5	1:4.8	1:5.7	1:4.2	1:5.0
50-100 mm	0.6	1:6.0	1:7.3	1:5.2	1:6.2
High	0.4	1:3.2	1:3.5	1:2.9	1:3.3
Slump	0.5	1:4.4	1:5.2	1:3.9	1:4.6
100-175 mm	0.6	1:5.4	1:6.7	1:4.7	1:5.7
	0.7	1:6.2	1:7.4	1:5.5	1:6.5

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- NOTE : 1 - Notwithstanding anything mentioned above, the cement/Total aggregate ratio is not to be increased beyond 1:9.0 without specific permission of the Engineer.
- NOTE : 2 - It should be noted that such high aggregate cement ratios will be required for concrete of very low slump and high water-cement ratios which may be required to be used in mass concrete work only.
- NOTE : 3 - The above figures are for guidance only. The actual cement/aggregate ratios are to be worked out from the specific gravities of coarse aggregates and sand being used and from trial mixes.

### 3.5 **Strength Requirements**

The strength requirements of both design mix and nominal mix concrete where ordinary Portland Cement or Portland slag cement is used, shall be as per Table-2 of IS:456. All other relevant clauses of IS:456 shall also apply.

### 3.6 **Minimum Cement Content**

The minimum cement content for each grade of concrete shall be as per Table-5 of IS : 456.

### 3.7 **Water-Cement Ratio**


The choice of water-cement ratio in designing a concrete mix will depend on the following :-

- a) The requirement of strength.
- b) The requirement of durability.

#### 3.7.1 **Strength Requirement**

In case of 'Design Mix Concrete', the water-cement ratio of such value as to give acceptable test results as per IS:456, will be selected by trial and error. The values of water-cement ratios for different grade and mix designs will have to be established after conducting sufficiently large number of preliminary tests in the laboratory to the satisfaction of the Engineer. Frequent checks on test will have to be carried out and the water-cement ratios will be revised if the tests produce unsatisfactory results. Notwithstanding anything stated above the Contractor's responsibility to produce satisfactory test results and to bear all the consequences in case of default remains unaltered.

In case of nominal mix concrete Table-9 of IS:456 may be followed. The acceptance criteria for nominal mix concrete shall be as per IS:456.

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### 3.7.2 Durability Requirement

Table-5 of IS:456 gives the maximum water-cement ratio permissible from the point of view of durability of concrete subjected to adverse exposure to weather, sulphate attacks, and contact with harmful a suitable plasticizer / super-plasticizer. However the contractor has to propose specifically along with field trials in the event of lower cement content if found suitable along with a plasticizer. It will be preferable to use Melamine based plasticizer.

### 3.8 Workability

The degree of workability necessary to allow the concrete to be well consolidated and to be worked into the corners of formwork and around the reinforcement and embedments and to give the required surface finish shall depend on the type and nature of structure and shall be based on experience and tests. The usual limits of consistency for various types of structures are given below :-

**TABLE - III**


**LIMITS OF CONSISTENCY**

Degree of workability	Slump in mm with Standard Cone as per IS:1199		Use for which concrete is suitable.
	Min.	Max.	
Very low	0	25	Large Mass concrete structure with heavy compaction equipment, roads and like.
Low	25	50	Uncongested wide & shallow R.C.C. structures.
Medium	50	100	Deep but wide RCC structures with congestion of reinforcement and inserts.
High	100	150	Very narrow & deep RCC structures with congestion due to reinforcement and inserts.

NOTE :

Notwithstanding anything mentioned above, the slump to be obtained for work in progress shall be as per direction of the Engineer.



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With the permission of the Engineer, for any grade of concrete, if the water has to be increased in special cases, cement shall also be increased proportionately to keep the ratio of water to cement same as adopted in trial mix design for each grade of concrete. No extra payment will be made for this additional cement. The workability of concrete shall be checked at frequent intervals by slump tests. Alternatively where facilities exist or if required by the Engineer, the compacting factor test in accordance with IS:1199.

### 3.9 **Size of Coarse Aggregates**

The maximum size of coarse aggregates for different locations shall be as follows unless otherwise directed by the Engineer :-

Very narrow space	-	12 mm
Reinforced concrete except foundation	-	20 mm
Ordinary Plain concrete and Reinforced concrete foundations	-	40 mm
Mass concrete	-	80 mm
Mass concrete in very large structure	-	150 mm

Grading of coarse aggregates for a particular size shall conform to relevant I.S. Codes and shall also be such as to produce a dense concrete of the specified proportions, strength and consistency that will work readily into position without segregation.


Coarse aggregate will normally be separated into the following sizes and stacked separately in properly designed stock piles :

150 mm to 80 mm, 80 mm to 40 mm, 40 mm to 20 mm and 20 mm to 5 mm. In certain cases it may be necessary to further split the 20 mm to 5 mm fraction into 20 mm to 10 mm and 10 mm to 5 mm fractions.

This separation of aggregates in different size fractions is necessary so that they may be remixed in the desired proportion to arrive at a correct internal grading to produce the best mix.

### 3.10 **Mixing of Concrete**

Concrete shall always be mixed in mechanical mixer unless specifically approved by the Engineer for concrete to be used in unimportant out of the way locations in small quantities. Water shall not normally be charged into the drum of the mixer until all the cement and aggregates constituting the batch are already in the drum and mixed for at least one minute. Mixing of each batch shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency, but in no case shall mixing be done for less than 2 (two) minutes and at least 40 (forty) revolutions after all the

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materials and water are in the drum. When absorbent aggregates are used or when the mix is very dry, the mixing time shall be extended as may be directed by the Engineer. Mixers shall not be loaded above their rated capacity as this prevents thorough mixing.

The entire contents of the drum shall be discharged before the ingredients for the next batch are fed into the drum. No partly set or remixed or excessively wet concrete shall be used. Such concrete shall be immediately removed from site. Each time the work stops, the mixer shall be thoroughly cleaned & when the next mixing commences, the first batch shall have 10% additional cement at no extra cost to the Owner to allow for loss in the drum.

Regular checks on mixer efficiency shall be carried out as directed by the Engineer as per IS:4634 on all mixers employed at site. Only those mixers whose efficiencies are within the tolerances specified in IS:1791 will be allowed to be employed.

Ingredients for design mix concrete shall be measured by weight. For small jobs portable swing weigh Bachers conforming to IS:2722 may be used.

Batching plant conforming to IS:4925 shall be used for large jobs. The accuracy of the measuring equipment shall be within + 2% of the quantity of Cement, water or total aggregates being measured and within + 5% of the quantity of any admixture being used. The batching equipment shall be fitted with an accurate mechanism for weighing separately the cement, fine aggregate and coarse aggregate. Water may be measured by volume or by weight. All measuring equipment should be maintained in a clean serviceable condition, and their accuracy shall be checked periodically.

Mechanical / electrical control shall be provided on the mixing equipment to ensure the batch cannot be discharged until approved mixing time has elapsed and the entire batch shall be discharged before the mixer is recharged.


Where admixtures are employed, separate containers & measuring devices shall be used.

For minor concreting works, batching by volume according to specific weight may be permitted by the Engineer. In that case the whole bags of cement shall be used and gauge boxes used for measuring aggregates.

When hand mixing is permitted by the Engineer, it shall be carried out on a water-tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. In case of hand-mixing, 10% extra cement shall be added to each batch at no extra cost to the Owner.

### 3.11 **Conveying Concrete**

Concrete shall be handled and conveyed from the place of mixing to the place of laying as rapidly as practicable by approved means and placed and compacted in the final position before the initial setting of the cement starts. Concrete should be conveyed in such a way as will prevent segregation or loss of any of the ingredients. For long distance haulage,

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agitator cars of approved design will be used. If, in spite of all precautions, segregation does occur during transport, the concrete shall be properly re-mixed before placement. During very hot or cold weather, if directed by the Engineer, concrete shall be transported in deep containers which will reduce the rate of loss of water by evaporation or loss of heat. If necessary, the container may have to be covered and insulated. Conveying equipments for concrete shall be well maintained and thoroughly cleaned before commencement of concrete mixing. Such equipments shall be kept free from set concrete.


### 3.12 **Placing and Compacting Concrete**

Where specifically covered, the relevant I.S. Code will be followed for the procedure of surface preparation, placement, consolidation, curing, finishes, repairs and maintenance of concrete. If, however, there is no specific provision in the relevant I.S. Code for any particular aspect of work, any other standard Code of practice, as may be specified by the Engineer, will be adopted. Concrete may have to be placed against the following types of surfaces :-

- a) Earth foundation
- b) Rock foundation
- c) Formwork
- d) Construction joint in concrete or masonry

The surface on or against which concrete is to be placed has to be cleaned thoroughly. Rock or old construction joint has to be roughened by wire brushing, chipping, sand blasting or any other approved means for proper bond. All cuttings, dirt, oil, foreign and deleterious material, laitance, etc. are to be removed by air water jetting or water at high pressure. All excavated areas for foundations, ring beams, plinths, pile caps etc. shall be rammed & consolidated properly before blinding with nominal mix plain concrete, as per drawing and / or direction of the Engineer and shall be allowed to cure prior to setting out steel fixing, shuttering and concrete pouring for the main structural element.

Formwork, reinforcement, preparation of surface, embedments, joint seals etc., shall be approved in writing by the Engineer before concrete is placed. As far as possible, concrete shall be placed in the formwork by means approved by the Engineer and shall not be dropped from a height or handled in a manner which may cause segregation. Any drop over 1500 mm shall have to be approved by the Engineer. Rock foundation or construction joint will be kept moist for at least 72 hours prior to placement. Concrete will be placed always against moist surface but never on pools of water. In case the foundation cannot be dewatered completely, special procedure and precaution, as directed by the Engineer will have to be adopted.

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Formwork will be cleaned thoroughly and smeared lightly with form oil or grease of approved quality just prior to placement.

A layer of mortar of thickness 12 mm of the same or less w/c ratio and the same proportion as that of the concrete being placed and cement slurry will be spread thoroughly on the rock foundation or construction joint just prior to placement of concrete. The cost of application of such cement slurry and mortar will be deemed to be included in the unit rate of concrete.


After concrete has been placed, it shall be spread, if necessary and thoroughly compacted by approved mechanical vibration to maximum subsidence without segregation and thoroughly worked around shape. Vibrators shall not be used for pushing concrete into adjoining areas. Vibrators must be operated by experienced workmen and the work carried out as per relevant IS Code of Practice. In thin members with heavy congestion of reinforcement or other embedments, where effective use of internal vibrator is, in the opinion of the Engineer, doubtful, in addition to immersion vibrators the contractor may have to employ form vibrators conforming to IS:4656. For slabs and other similar structures, the contractor will additionally employ screed vibrator as per IS:2506. Hand tamping may be allowed in rare cases, subject to the approval of the Engineer. Care must be taken to ensure that the inserts, fixtures, reinforcement and formwork are not displaced or distorted during placing and consolidation of concrete.

The rate of placement of concrete shall be such that no cold joint is formed and fresh concrete is placed always against green concrete which is still plastic and workable. No concrete shall be placed in open, during rains. During rainy season, no placement in the open is to be attempted unless sufficient tarpaulins or other similar protective arrangement for completely covering the still green concrete from rain is kept at the site of placement. If there has been any sign of washing of cement and sand, the entire affected concrete shall be removed immediately. Suitable precautions shall be taken in advance to guard against rains before leaving the fresh concrete unattended. No accumulation of water shall be permitted on or around freshly laid concrete.

The size of the concrete pours must be carefully considered prior to commencement to ensure the structural elements are poured in on continuous shift to avoid cold joints.

Slabs, beams and similar members shall be poured in one operation, unless otherwise instructed by the Engineer. Moulding, throating, drip course, etc., shall be poured as shown on the drawings or as directed by the Engineer. Holes shall be provided and bolts, sleeves, anchors, fastenings or other fixtures shall be embedded in concrete as shown on the drawings or as directed by the Engineer. Any deviation therefrom shall be set right by the Contractor at his own expense as instructed by the Engineer.

In case the forms or supports get displaced during or immediately after the placement and bring the concrete surface out of alignment beyond tolerance limits, the Engineer may direct to remove the portion and reconstruct or repair the same at the Contractor's expense.

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The Engineer shall decide upon the time interval between two placements of concrete of different ages coming in contact with each other, taking in consideration the degree of maturity of the older concrete, shrinkage, heat dissipation and the ability of the older concrete to withstand the load imposed upon it by the fresh placement.

Once the concrete is deposited, consolidated and finished in its final position, it shall not be distributed.

### 3.13 **Construction Joints and Cold Joints**


#### 3.13.1 **Construction Joints**

It is always desirable to complete any concrete structure by continuous pouring in one operation. However, due to practical limitation of methods and equipment and certain design considerations, construction joints are formed by discontinuing concrete at certain predetermined stages. These joints will be formed in a manner specified in the drawings/Instruction. Vertical construction joints will be made with rigid stop-board forms having slots for allowing passage of reinforcement rods and any other embedments and fixtures that may be shown. Next stage concrete shall be placed against construction joint as per clause 3.12. For water retaining structures and leak-proof buildings suitable approved water bars will be installed at the construction joints.

Where the location of the joints are not specified, it will be in accordance with the following :-

- a) In a column, the joint shall be formed 75 mm below the lowest soffit of the beam framing into it.
- b) Concrete in a beam shall preferably be placed without a joint, but if provision of a joint is unavoidable, the joint shall be vertical and within the middle third of the span.
- c) A joint in a suspended floor slab shall be vertical and within the middle third of the span and at right angles to the principal reinforcement.
- d) Feather-edges in concrete shall be avoided while forming a joint.
- e) A construction joint should preferably be placed in a low-stress zone and at right angles to the direction of the principal stress.
- f) In case the Contractor proposes to have a construction joint anywhere to facilitate his work, the proposal should be submitted well in advance to the Engineer for study and approval without which no construction joint will be allowed.

#### 3.13.2 **Cold Joint**

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An advancing face of a concrete pour, which could not be covered by fresh concrete before expiry of initial setting time (due to an unscheduled stoppage or delay on account of breakdown in plant, inclement weather, low rate of placement or any other reason), is called a cold joint. The Contractor should always remain vigilant to avoid cold joints.

If, however, a cold joint is formed due to unavoidable reasons, the following procedure shall be adopted for treating it :-


- a) If the concrete is so green that it can be removed manually and if vibrators can penetrate the surface without much effort, fresh concrete can be placed directly against the old surface. The old concrete should be covered by fresh concrete as quickly as possible and the joint thoroughly and systematically vibrated.
- b) In case concrete has hardened a bit more than (a) but can still be easily removed by a light hand pick, the surface will be raked thoroughly and the loose concrete removed completely without disturbing the rest of the concrete in depth. A rich mortar layer 12 mm in thickness, will be placed on the cold joint fresh concrete shall be placed on the mortar layer and the joint will be thoroughly and systematically vibrated penetrating the vibrator deep into the old layer of concrete.
- c) In case the concrete at the joint has become so stiff that it cannot be remoulded and mortar or slurry does not rise in spite of extensive vibration, the joint will be left to harden for at least 12 - 24 hrs. It will then be treated as a regular construction joint, after cutting the concrete to required shape and preparing the surface as described under clause 3.12.

### 3. 14 **Repairs, Finishes and Treatment of Concrete surfaces**

3. 14.1 Adequate and sound concrete surfaces, whether formed or unformed, can be obtained by employing a concrete mix of proper design, competent formwork, appropriate methods of handling, placing and consolidation by experienced workmen.

Unsound concrete resulting from improper mix design, incompetent methods, equipment and formwork, poor workmanship and protection will not be accepted and will have to be dismantled, removed and replaced by sound concrete at the Contractor's cost. The Engineer may, at his sole discretion, allow to retain concrete with minor defects provided the Contractor is able to repair it by approved methods at no extra cost to the Owner. All concrete work shall be inspected by the Contractor immediately after the forms are removed and he will promptly report occurrence of any defects to the Engineer. All repair work will be carried out as per the instructions and in the presence of the Engineer or his representative. Generally, repair work will consist of any or all of the following operations :-

- a) Sack rubbing with mortar and stoning with carborundum stone.
- b) Cutting away the defective concrete to the required depth and shape.

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- c) Cleaning of reinforcement and embedments. It may be necessary to provide an anti-corrosive coating on the reinforcement.
- d) Roughening by sand blasting or chipping.
- e) Installing additional reinforcement / welded mesh fabric.
- f) Dry packing with stiff mortar.
- g) Plastering, guniting, shotcreting etc.
- h) Placing and compacting concrete in the void left by cutting out defective concrete.
- i) Grouting with a cement sand slurry of 1:1 mix.
- j) Repairing with a suitable mortar either cement or resin modified mortar.
- k) Polymer modified patching and adhesive repair mortar for beams & columns.


### 3.14.2 **Finishing Unformed Surface**

A few typical and common cases of treatment of unformed concrete surface are cited below :-

#### a) Floor

Whenever a non-integral floor finish is indicated, the surface of reinforced concrete slab shall be struck off at the specified levels and slopes and shall be finished with a wooden float fairly smooth removing all laitance. No over-trowelling, to obtain a very smooth surface, shall be done as it will prevent adequate bond with the subsequent finish. If desired by the Engineer, the surface shall be scored and marked without any extra cost to the Owner to provide better bond.

Where monolithic finish is specified or required, concrete shall be compacted and struck off at the specified levels and slopes with a screed, preferably a vibrating type and then floated with a wooden float. Steel trowelling by hand or by rotary power float is then started after the moisture film and shine have disappeared from the surface and after the concrete has hardened enough to prevent excess of fines and water to rise to the surface but not hard enough to prevent proper finishing of aberrations. Steel trowelling properly done will flatten and smoothen sandy surface left by wooden floats and produce a dense surface free from blemishes, ripples and trowel marks. A fine textured surface that is not slick and can be used where there is likelihood of spillage of oil or water can be obtained by trowelling the surface

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lightly with a circular motion after initial trowelling keeping the steel trowel flat on the surface.

To provide a better grip the Engineer may instruct marking the floor in a regular geometric pattern after initial trowelling.

b) Beams, Columns & Walls

If on such or any other concrete structure it is intended to apply plaster or such concrete surfaces against which brickwork or other allied works are to be built, the Contractor shall hack the surface adequately as soon as the form is stripped off so that proper bond can develop. Pattern, adequacy and details of such hacking shall meet with the approval of the Engineer, who shall be informed to inspect such surfaces before they are covered up.

### 3.15 Protection and Curing of concrete


Newly placed concrete shall be protected by approved means from rain, sun and wind. Concrete placed below the ground level shall be protected against contamination from falling earth during and after placing. Concrete placed in ground containing deleterious substances, shall be protected from contact with such ground, or with water draining from such ground, during placing of concrete and for a period of at least three days or as otherwise instructed by the Engineer. The ground water around newly poured concrete shall be kept to an approved level by pumping out or other adequate means of drainage to prevent floatation or flooding. Steps, as approved by the Engineer, shall be taken to protect immature concrete from damage by debris, excessive loadings, vibration, abrasion, mixing with earth or other deleterious materials, etc. that may impair the strength and durability of the concrete.

As soon as the concrete has hardened sufficiently, it shall be covered either with sand, polythene sheet, hessian, canvas or similar materials and kept continuously wet for at least 14 (fourteen) days after final setting. Curing by continuous sprinkling of water will be allowed if the Engineer is satisfied with the adequacy of the arrangements made by the Contractor.

If permitted by the Engineer, curing compound like "ANTISOLE (WP)" or approved equivalent may be used for prevention of premature water loss in concrete and thereby effecting curing of concrete. This type of curing compound shall be sprayed on newly laid concrete surfaces to form thin film barrier against premature water loss without disturbances to normal setting action. The curing compound shall comply with ASTM requirements for acceptance.

The curing compound shall be applied following the final finishing operation and immediately after disappearance of water sheen from concrete surface.



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It is important not to apply the curing compound when standing water is still present on concrete.

The contractor shall arrange for the manufacturer's supervision at no extra cost to the owner.

The Contractor shall remain extremely vigilant and employ proper equipment and workmen under able supervision for curing. The Engineer's decision regarding the adequacy of curing is final. In case any lapse on the part of the Contractor is noticed by the Engineer, he will inform the Contractor or his supervisor verbally or in writing to correct the deficiency in curing. If no satisfactory action is taken by the Contractor within 3 (three) hours of issuance of such instruction, the Engineer will be at liberty either to employ sufficient means through any agency to make good the deficiency and recover the cost thereof from the Contractor, or pay for the part where adequate curing was noticed at a reduced rate, entirely at the discretion of the Engineer.

### 3.16 **Reinforcement**

Mild steel round bars, cold twisted and deformed bars as medium tensile or high yield strength steel, plain hard drawn steel wire fabric etc., will be used as reinforcement as per drawings and directions. In an aggressive environment an anti-corrosive coating on the reinforcement may be provided as per IS:9077, as shown on the drawing or as directed by the Engineer.


#### 3.16.1 **Bar Bending Schedules**

The Contractor shall submit to the Engineer for approval Bar Bending Schedules with working drawings in triplicate, showing clearly the arrangements proposed by the Contractor to match available stock of reinforcing steel, within one month of receipt of the Letter of Intent or of the receipt of the relevant design drawings, whichever is later. Upon receipt of the Engineer's final approval of the Bar Bending Schedule and drawings, the Contractor shall submit 6 (six) prints of the final drawings with one reproducible print after incorporating necessary modifications or corrections, for final record and distribution. Approval of such detailed drawings by the Engineer shall not relieve the Contractor of his responsibility for correctness nor of any of his obligations to meet the other requirements of the Contract.

#### 3.16.2 **Cleaning**

All steel for reinforcement shall be free from loose scales, oil, grease, paint or other harmful matters immediately before placing the concrete.

#### 3.16.3 **Cutting & Bending of Reinforcement**

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Unless otherwise specified, reinforcing steel shall be bent in accordance with the procedure specified in IS:2502 or as approved by the Engineer. Bends and shapes shall comply strictly with the dimensions corresponding to the approved Bar Bending Schedules. Bar Bending Schedules shall be rechecked by the Contractor before any bending is done.

No reinforcement shall be bent when already in position in the work, without approval of the Engineer, whether or not it is partially embedded in concrete. Bars shall not be straightened in a manner that will injure the material. Rebending can be done only if approved by the Engineer. Reinforcing bars above 16 mm diameter shall be bent by machine producing a gradual and even motion. Bars of 16 mm or below may be bent by hand. All the bars shall be cold bent unless otherwise approved. Bending hot at a cherry-red heat(not exceeding 845°C) may be allowed under very exceptional circumstances except for bars whose strength depends on cold working. Bars bent hot shall not be cooled by quenching.

Reinforcing bars, whether high yield or mild steel shall be cut using either hand held shears, guillotines or foot operated pneumatic cutters. Cutting bars using cold chisels may be allowed by the Engineer at exceptional cases.


#### 3.16.4 **Placing in Position**

All reinforcements shall be accurately fixed and maintained in position as shown on the drawings by such approved and adequate means like mild steel chairs and/or concrete spacer blocks irrespective of whether such supports are payable or not. Bars intended to be in contact at crossing points, shall be securely tied together at all such points by No. 20 G annealed soft iron wire. Tack welding of bars should not be done unless permitted by the Engineer. Binders shall tightly embrace the bars with which they are intended to be in contact and shall be securely held. The vertical distance between successive layers of bars shall be maintained by provision of mild steel spacer bars. They should be spaced such that the main bars do not ag perceptibly between adjacent spacers. Before actual placing, the Contractor shall study the drawings thoroughly and inform the Engineer in case he feels that placement of certain bars is not possible due to congestion. In such cases he should not start placing any bar before obtaining clearance from the Engineer.

#### 3.16.5 **Welding**

Normal bond laps in reinforcement may be placed by lap or butt welding reinforcement bars, if asked by the Engineer, under certain conditions. The work should be done with suitable safeguards in accordance with relevant Indian Standards for welding of mild steel bars used in reinforced concrete construction as per IS:2751 and IS:456. Welded mesh fabrics conforming to IS:1566 may also be used if specified in the Schedule of Items and Drawings.

#### 3.16.6 **Control**

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The placing of reinforcements shall be completed well in advance of concrete pouring. Immediately before pouring, the reinforcement shall be examined by the Engineer for accuracy of placement and cleanliness. Necessary corrections as directed by him shall be carried out. Laps and anchorage lengths of reinforcing bars shall be in accordance with IS:456, unless otherwise specified. If the bars in a lap are not of the same diameter, the smaller will guide the lap length. The laps shall be staggered as far as practicable and as directed by the Engineer. Arrangements for placing concrete shall be such that reinforcement in position does not have to bear extra load and get disturbed.

The cover for concrete over the reinforcements shall be as shown on the approved drawings unless otherwise directed by the Engineer. Where concrete blocks are used for ensuring the cover and positioning reinforcement, they shall be made of mortar not leaner than 1 (one) part cement to 2 (two) parts sand by volume and cured in a pond for at least 14 (fourteen) days. The type, shape, size & location of the concrete blocks shall be as approved by the Engineer.

### 3.17 **Cold Weather Concreting**

When conditions are such that any operation of concreting may be expected to be done at 5 Deg.C atmospheric temperature or below the work shall conform to the requirement of Clause 14 of IS:456 and IS:7861. (Part. II).

### 3.18 **Hot Weather Concreting**

When depositing concrete in very hot weather, the Contractor shall take all precautions as per IS:7861 (Part-I) and stagger the work to the cooler parts of the day to ensure that the temperature of wet concrete used in massive structures does not exceed 40 Deg.C while placing. Positive temperature control by precooling, postcooling or any other method, if required, will be specified and paid for separately.

### 3.19 **Concreting under water**


When it is necessary to deposit concrete under water it shall be done in accordance with the requirements of clause 14 of IS:456.

### 3.20 **Form Work**

#### 3.20.1 **General**

Formwork shall conform to the shape, grade, lines, levels and dimension as shown on the drawings. The contractor shall prepare design & working drawings for formwork & temporary support system for important structures and get them approved by the Engineer prior to commencement of actual work.

Materials used for the formwork inclusive of the supports and centering shall be capable of withstanding the working load and remain undistorted throughout the period it is left in

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service. All supports and scaffolds should be manufactured from structural or tubular steel except when specifically permitted otherwise by the Engineer.

The centering shall be true to vertical, rigid and thoroughly braced both horizontally and diagonally. Rekers are to be used where forms are to support inclined members. The forms shall be sufficiently strong to carry without undue deformation, the dead weight of the concrete as a liquid as well as the working load, in case the Contractor wishes to adopt any other design criteria, he has to convince the Engineer about its acceptability before adopting it. Where the concrete is vibrated, the formwork shall be strong enough to withstand the effects of vibration without appreciable deflection, bulging, distortion or loosening of its components. The joints in the formwork shall be sufficiently tight to prevent any leakage of slurry or mortar.

To achieve the desired rigidity, tie bolts, spacer blocks, tie wires and clamps as approved by the Engineer shall be used but they must in no way impair the strength of concrete or cause stains or marks on the finished surface. Where there are chances of these fixtures being embedded, only mild steel or concrete of adequate strength shall be used. Alternatively, except in case of water retaining structures through rods and the tie bolts shall be sleeved with PVC conduits to allow retraction of the ties on removal of the shutters. Where required, the annulus of the conduits will be filled with expanding mortar to seal the void. Bolts passing completely through liquid retaining walls/slabs for the purpose of securing and aligning the formwork shall not be used.


The formwork shall be such as to ensure a smooth uniform surface free from honeycombs, air bubbles, bulges, fins and other blemishes. Any blemish or defect found on the surface of the concrete must be brought to the notice of the Engineer immediately and rectified free of charge as directed by him.

For exposed interior and exterior concrete surfaces of beams, columns and wall, plywood or other approved form shall be thoroughly cleaned and tied together with approved corrosion- resistant devices. Rigid care shall be exercised in ensuring that all column forms are plumb and true and thoroughly cross braced to keep them so. All floor and beam centering shall be crowned not less than 8 mm in all directions for every 5 metres span. Unless specifically described on the drawings or elsewhere to the contrary, beveled forms 25 mm by 25 mm shall be fixed in the form-work at all corners to provide chamfering of the finished concrete edges without any extra charge. The formwork should lap and be secured sufficiently at the lift joints to prevent bulges and offsets.

Temporary openings for cleaning, inspection and for pouring concrete shall be provided at the base of vertical forms and at other places, where they are necessary and as may be directed by the Engineer. The temporary openings shall be so formed that they can be conveniently closed when required, during pouring operations without leaving any mark on the concrete.

### 3.20.2

### **Cleaning and Treatment of Forms**

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All parts of the forms shall be thoroughly cleaned of old concrete, wood shavings, saw dust, dirt and dust sticking to them before they are fixed in position. All rubbish, loose concrete, chippings, shavings, saw dust etc. shall be scrupulously removed from the interior of the forms before concrete is poured. Compressed air jet and/or water jet along with wire brushes, brooms etc. shall be used for cleaning. The inside surface of the formwork shall be treated with approved non-staining oil based shutter release agent like "Siparol/Sika form oil/ Siparol Concentrate" or approved equivalent before it is placed in position. Care shall be taken that oil or other compound does not come in contact with reinforcing steel or construction joint surfaces. They shall not be allowed to accumulate at the bottom of the formwork. The oiling of the formwork will be inspected just prior to placement of concrete and redone wherever necessary.

### 3.20.3 **Design**

The formwork shall be so designed and erected that the forms for slabs and the sides of beams, columns and walls are independent of the soffits of beams and can be removed without any strain to the concrete already placed or affecting the remaining formwork. Removing any props or reproping shall not be done except with the specific approval of the Engineer. If formwork for column is erected for the full height of the column, one side shall be left open and built up in sections, as placing of concrete progress. Wedges, spacer bolts, clamps or other suitable means shall be provided to allow accurate adjustment and alignment of the formwork and to allow it to be removed gradually without jarring the concrete.


The design of formwork shall take into account all vertical and lateral loads that the forms will carry or be subjected to during the construction process. Besides weight and pressures of reinforced concrete and weight of the forms themselves, the design shall consider loading due to unsymmetrical placement of concrete; impact from dumping of concrete; movement of men and construction equipment; wind action and any other imposed load during construction. The contractor shall assess the magnitude of vertical live load to be taken for design of formwork duly considering his method, sequence and rate of pour of concrete. However, minimum design vertical live load to be considered shall be 750 kg/sqm excluding weight of concrete.

### 3.20.4 **Inspection of Forms**

Casting of Concrete shall start only after the formwork has been inspected and approved by the Engineer. The concreting shall start as early as possible within 3 (three) days after the approval of the formwork and during this period the formwork shall be kept under constant vigilance against any interference. In case of delay beyond three days, a fresh approval from the Engineer shall be obtained.

### 3.20.5 **Removal of Forms**

Before removing any formwork, the Contractor must notify the Engineer well in advance to enable him to inspect the concrete if he so desires. The Contractor shall record on the

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drawing or in any other approved manner, the date on which concrete is placed in each part of the work and the date on which the formwork is removed therefrom and have this record checked and countersigned by the Engineer regularly.

The Contractor shall be responsible for the safe removal of the formwork and any work showing signs of damage through premature removal of formwork or loading shall be rejected and entirely reconstructed by him without any extra cost to the Owner. The Engineer may, however, instruct to postpone the removal of formwork if he considers it necessary.

Forms for various types of structural components shall not be removed before the minimum periods specified herein and the removal after the minimum periods shall also be subject to the approval of the Engineer in each case.

**TABLE - IV**  
**SCHEDULE OF REMOVAL OF FORM**

	Ordinary Portland Cement Concrete				Rapid Hardening Portland Cement Concrete			
	Days	Days	Days	Days	Days	Days	Days	Days
a) Columns & Walls	2	1	1	Do not remove forms until site cured test specimen develop at least 50% of the specimen	1	1	1	Do not remove forms until site cured test
b) Beam sides	3	2	3		2	1	1	
c) Slabs, 125 mm	10	7	8		7	4	5	
d) Slabs over 125 mm thick and soffit of minor beams	18	14	16	specified 28 days strength	12	8	9	develop at least 50% of the specified 28 days strength
e) Soffit of main beams	24	21	22		14	10	12	

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Wherever exposed surfaces of concrete can be effectively sealed to prevent loss of water, the periods specified for temperature above 40 Deg.C can be reduced to those of the temperature range of 20 Deg.C to 40 Deg.C subject to approval of the Engineer.

Construction joints in beams, if required to be provided, will be located within the middle third of span according to clause 3.13.1(b) of this specification. In such cases, however, entire span of beam shall have to be kept supported by formwork till its removal for the portion of beam, cast at a later date, is due and so approved by the Engineer.

If any type of cement other than ordinary portland cement and Rapid hardening portland cement is used the time of removal of forms shall be revised as approved by the Engineer such that the strength of this cement at the time of removal of forms match with strength of portland cement at the time of removal of form as mentioned above. This has to be supported by regular tests.

#### 3.20.6 **Tolerance**

The formwork shall be so made as to produce a finished concrete, true to shape, lines, levels, plumb and dimensions as shown on the drawings subject to the following tolerances unless otherwise specified in this Specification or drawings or directed by the Engineer :-


- |       |    |                     |   |  |
|-------|----|---------------------|---|--|
| For - | a) | Sectional dimension | - | $\pm 5$ mm                                       |
|       | b) | Plumb               | - | 1 in 1000 of height                              |
|       | c) | Levels              | - | $\pm 3$ mm before any deflection has taken place |

The tolerance given above are specified for local aberrations in the finished concrete surface and should not be taken as tolerances for the entire structure taken as a whole or for the setting and alignment of formwork, which should be as accurate as possible to the entire satisfaction of the Engineer. Any error, within the above tolerance limits or any other as may be specially set up by the Engineer, if noticed in any lift of the structure after stripping of forms, shall be corrected in the subsequent work to bring back the surface of the structure to its true alignment.

#### 3.20.7 **Re-use of Forms**

Before re-use, all forms shall be thoroughly scraped, cleaned, joints and planes examined and when necessary repaired, and inside surface treated as specified hereinbefore. Formwork shall not be used / re-used if declared unfit or unserviceable by the Engineer.

#### 3.20.8 **Classification**

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Generally, the 'ordinary' class formwork shall be used unless otherwise directed by the Engineer :-

- a) Ordinary : These shall be used in places where ordinary surface finish is required and shall be composed of steel and / or approved good quality partially seasoned timber.
- b) Plywood : These shall be used in exposed surfaces, where a specially good finish is required and shall be made of approved brand of heavy quality plywood to produce a perfectly uniform and smooth surface conforming to the shape described in the drawing with required grain texture on the concrete. Re-use may only be permitted after special inspection and approval by the Engineer. He may also permit utilisation of used plywood for the 'ordinary' class, if it is still in good condition.
- c) Ornamental: These shall be used where ornamental and curved surface are required and shall be made of selected best quality well seasoned timbers or of plywood, which can be shaped correctly.

### 3.21 **Opening, Chases, Grooves, Rebates, Blockouts etc.**

The Contractor shall leave all openings, grooves, chases, etc. in concrete work as shown on the drawings or as specified by the Engineer.

### 3.22 **Anchor Bolts, Anchors, Sleeves, Inserts, Hangers/Conduits/Pipe and Other misc. Embedded Fixtures.**


The Contractor shall build into concrete work all the items noted below and shall embed them partly or fully as directed and secure the same as may be required. The materials, if required to be supplied by the Contractor, shall be as specified and be of best quality available according to relevant Indian Standards of approved manufacture and to the satisfaction of the Engineer. Exposed surfaces of embedded materials are to be painted with one coat of approved anti-corrosive paint and / or bituminous paint without any extra cost to the Owner. If welding is to be done subsequently on the exposed surface of embedded material the paint shall be cleaned off the member to a minimum length of 50 mm beyond each side of the weld line.

Necessary templates, jigs, fixtures, supports etc. shall be used as may be required or directed by the Engineer, free of cost to the Owner.

Items to be embedded :-

- a) Inserts, hangers, anchors, frames around openings, manhole covers, frames, floor clips, sleeves conduits and pipes.
- b) Anchor bolts and plates for machinery, equipment and for structural steel work.
- c) Steel structural to be left embedded for future extension, special connection etc.



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- d) Lugs or plugs for door and window frames occurring in concrete work.
- e) Flashing and jointing in concrete work.
- f) Any miscellaneous embedment and fixture as may be required.

Correct location and alignment, as per drawings/instruction of all these embedded items shall be entirely the responsibility of the Contractor.

### 3.23 **Expansion and Isolation Joints**

#### 3.23.1 **General**

Expansion and isolation joints in concrete structures shall be provided at specific places as per details indicated on the drawings. The materials and types of joints shall be as specified hereinafter. In case of liquid retaining structures, additional precautions shall be taken to prevent leakage of liquids as may be specified on the drawings or as directed by the Engineer. All materials are to be procured from reliable manufacturers and must have the approval of the Engineer. Where it is the responsibility of the Contractor to supply the material, the Engineer may demand test certificates for the materials and / or instruct the Contractor to get them tested in an approved laboratory free of cost to the Owner. Joints shall be formed true to line, level, shape, dimension and quality as per drawings and specifications. Prior approval of the method of forming the joints should be obtained from the Engineer before starting the work.


#### 3.23.2 **Bitumen Board/Expanded Polystyrene Board**

##### 3.23.2.1 **Bitumen Board**

Bitumen impregnated fibre board of approved manufacturer as per IS:1838 may be used as fillers for expansion joints. It must be durable and waterproof. It shall be compressible and possess a high degree of rebound. The dimensions of the board should be equal to that of the joint being formed. It should, preferably be manufactured in one piece, matching the dimension of the joint and not prepared by cutting to size smaller pieces from larger boards at site. At the exposed end, the joint shall be sealed with approved sealing compound to a depth of at least 25 mm after application of an approved primer. The sealing compound and the primer shall be applied as specified by the manufacturer.

##### 3.23.2.2 **Expanded Polystyrene Boards**

If required, commercial quality of expanded polystyrene products commonly used for thermal insulation may also be used as filler material in expansion joints. The thickness may vary from 12 mm to 50 mm. The material will have to be procured from reliable manufacturers as approved by the Engineer. The method of installations will be similar to

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that recommended by the manufac-turers for fixing on cold storage walls. A coat of Bitumen paint may have to be applied on the board against which concrete will be placed.

### 3.23.3 **Joint Sealing Strips**

Joint sealing strips may be provided at the construction, expansion and isolation joints as a continuous diaphragm to contain the filler material and / or to exclude passage of water or any other material into or out of the structure. The sealing strips will be either metallic like G.I., Aluminium or Copper, or non-metallic like rubber or P.V.C.

Sealing strips will not have any longitudinal joint and will be procured and installed in largest practicable lengths having a minimum number of transverse joints. The material is to be procured from reputed manufacturers having proven records of satisfactory supply of joint strips of similar make and shape for other jobs. The jointing procedure shall be as per the manufacturer's recommendations, revised if necessary, by the Engineer. The Contractor is to supply all labour and material for installation including the material and tools required for jointing, testing, protection, etc. If desired by the Engineer, joints in rubber seals may have to be vulcanised.

#### 3.23.3.1 **Metal Sealing Strips**

Metal sealing strips shall be either G.I., Aluminium or Copper and formed straight, U shaped, Z shaped or any other shape and of thickness as indicated in the drawing and schedule of items and/or as instructed by the Engineer.

The transverse joints will be gas welded using brass rods and approved flux and will be tested by an approved method to establish that it is leakproof. Longer lap lengths and different method of brazing which will render it leakproof, will be adopted by the Contractor without any additional cost to the Owner. The edges shall be neatly crimped and bent to ensure proper bond with the concrete.


##### a) **G. I. Strips**

G.I. strips shall be minimum 1.5 mm thick and 300 mm in width unless specified otherwise. The standard of Galvanising shall be as per relevant Indian Standards for heavy duty work. At the joints, the overlapping should be for a minimum length of 50 mm.

##### b) **Aluminium Strips**

Aluminium strips shall be minimum 18 SWG thick and 300 mm wide unless specified otherwise and shall conform to IS : 737 of 19000 grade or 31000 grade (Designatiion as per IS : 6051). A minimum lap of 50 mm length is required at the joints

##### c) **Copper Strips**

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The Copper strips shall be minimum 18 SWG in thickness and 300 mm wide unless specified otherwise and shall conform to the relevant Indian Standards. These should be cleaned thoroughly before use to expose fresh surface, without any reduction in gauge. A minimum lap of 50 mm in length is required at the joints.

### 3.23.3.2 **Non - metallic sealing strips**

These will be normally in Rubber or P.V.C and can be of shapes having any combination of the following features :-

- a) Plain
- b) Central bulb
- c) Dumb-bell or flattened ends
- d) Ribbed and Corrugated Wings
- e) V shaped


As these types of seals can be easily handled in very large lengths, transverse joints will be allowed only under unavoidable circumstances and with the specific approval of the Engineer.

The method of forming these joints, laps etc. shall be as specified by the Manufacturer and / or as approved by the Engineer taking particular care to match the central bulbs and the edges accurately.

#### a) **Rubber Sealing Strips**

The minimum thickness of Rubber sealing strips shall be 3 mm and the minimum width 100 mm. The actual size and shape will be as shown in drawings/schedule of items and/or as directed by the Engineer. The material will be natural rubber and be resistant to corrosion, abrasion and tear and also to attacks from the acids, alkalis and chemicals normally encountered in service. The physical properties will be generally as follows. The actual requirements may be slightly different as decided by the Engineer

Specific Gravity	:	1.1 to 1.15
Shore Hardness	:	65A to 75A
Tensile Strength	:	25 - 30 N/Sq.mm

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Maximum Safe Continuous Temperature : 75 Deg.C

Ultimate Elongation : Not less than 350%

**b) P.V.C. Sealing Strips**

The minimum thickness of P.V.C. sealing strips shall be 3 mm and the minimum width 100 mm. The actual size and shape will be as shown in drawings/schedule of items and/or as directed by the Engineer. The material should be of good quality Polyvinyl Chloride highly resistant to tearing, abrasion and corrosion as well as to chemicals likely to come in contact with during use. The physical properties will generally be as follows. The actual requirements, which will be directed by the Engineer, may vary slightly :-

Specific Gravity : 1.3 to 1.35

Shore Hardness : 60A to 80A

Tensile Strength : 10 - 15 N/Sq.mm

Maximum Safe Continuous Temperature: 70 Deg.C

Ultimate Elongation : Not less than 275%

**3.23.4 Joint Sealing Compound**


When directed, the gap in expansion joints shall be thoroughly cleaned and bitumen compound laid as per manufacturer's specifications. The compound to be used shall be of approved manufacture and shall conform to the requirements of IS:1834.

Alternatively, when directed, the expansion Joints may be filled with joint sealing compound like "Sikalastic" or approved equivalent and shall be applied as per manufacturer's specification.

**3.23.5 Isolation Joints**

Strong and tough alkathene or PVC sheet or equivalent, about 1 mm in thickness and as approved by the Engineer shall be used in isolation joints. It shall be fixed by an approved adhesive compound on the cleaned surface of the already set concrete, to cover it fully. Fresh concrete shall be laid against the sheet, care being taken not to damage the sheet in any way.

**3.23.6 Rubber Pad**

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Hard foundation quality rubber pads of required thickness and shapes shall be put below machine or other foundations as shown on the drawings or as directed by the Engineer. The rubber shall have a unit weight of 1500 Kg/Cu.m, a shore hardness of 65A to 70A and be of best quality of approved manufacture, durable, capable of absorbing vibration and must be chemically inert in contact with moist or dry earth or any other deleterious material expected under normal conditions.

### 3.24 **Grouting under Machinery or Structural Steel Bases**


If required, grouting under base plates of machines or structural steel etc. shall be carried out by the Contractor. In general, the mix shall be 1 (one) part cement and 1 (one) part sand and just enough water to make it flow as required. The areas to be grouted shall be cleaned thoroughly with compressed air jet and/or with water in locations where accumulated surplus water can be removed. Where directed by the Engineer, 6 mm down stonechips may have to be used in the mix. Surface to be grouted shall be kept moist for at least 24 hours in advance. The grout shall be placed under expert supervision, so that there is no locked up air. Edges shall be finished properly. If desired by the Engineer, admixtures like Aluminium powder, 'Ironite' etc. may have to be added with the grout in proportions to be decided by the Engineer. Admixture, if directed to be added, will be measured and paid separately.

Alternatively non-shrink, free flow, cementitious grout like "SikagROUT 214/ Ankor NSG" or approved equivalent specifically selected for the type of equipment to be located (vibrating, static etc.) may also be used for grouting as per manufacturer's specification with necessary approval of the Engineer.

### 3.25 **Precast Concrete**

The Specification for precast concrete will be similar as for the cast-in-place concrete described herein and as supplemented in this section. All precast work shall be carried out in a yard made for the purpose.

This yard shall be dry, properly levelled and having a hard and even as well as well drained surface to prevent excessive uneven settlement due to softening of soil during casting & curing. If the ground is to be used as a soffit former of the units, it shall be paved with concrete or masonry and provided with a layer of plaster (1:2 proportion) with smooth neat cement finish or a layer of M.S. sheeting. Where directed by the Engineer, casting will have to be done on suitable vibrating table. The yard, lifting equipment, curing tank, finished material storage space etc. shall be designed such that the units are not lifted from the mould before 10 (Ten) days of curing and can be removed for erection after 28 (twenty eight) days of curing. The moulds shall preferably be of steel or of timber lined with G.I. sheet metal and must be rigid enough to prevent distortion during placing and compaction of the concrete. The yard shall preferably be fenced.

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Other than normal curing by applying water through spray nozzles or perforated hose curing by high pressure steam, steam vapour or other accepted processes may also be employed to accelerate the hardening of the concrete and to reduce the curing time.

Lifting hooks, where necessary or as directed by the Engineer, shall be embedded in correct position of the units to facilitate erection, even though they may not be shown on the drawings, and shall be burnt off and finished after erection.

All members shall be indelibly marked with a unique identification mark on a surface which will not be permanently exposed to show on which production line they were manufactured, their type, the class of concrete, the data of casting and if they are of a symmetrical section the face which will be uppermost when the member is in its correct position after erection.

Precast concrete units, when ready, shall be transported to site by suitable means approved by the Engineer. Care shall be taken to ensure that no damage occurs during transportation. All adjustments, levelling and plumbing shall be done as per instructions of the Engineer. The Contractor shall render all help with instruments, materials and men to the Engineer for checking the proper erection of the precast units.

After erection and alignment, the joints shall be filled with grout or concrete as directed by the Engineer. If centerings have to be used for supporting the precast units, they shall not be removed until the joints have attained sufficient strength and in no case before 14 (fourteen) days. The joint between precast roof planks shall be pointed with 1:2 cement : sand mortar where called for in the drawings.

### 3.26 **Waterproofing of Concrete Structure**


#### 3.26.1 **General**

Waterproofing of concrete structures shall be done by either suitable extraneous treatments like applying waterproofing paints like "Sikatop Seal" or approved equivalent, fixing bitumen felts etc. or internally by suitable design of the concrete mix, addition of suitable admixtures conforming to IS:2645 and equivalent American or British codes in the concrete or mortar at the time of mixing and/or installing water bars at the joints.

The design, material and workmanship shall conform to the relevant I.S. Codes where applicable. The Engineer's approval of the materials shall be obtained by the Contractor before procurement. If desired by the Engineer, test certificates for the materials and samples shall be submitted by the Contractor free of charge. The materials shall be of best quality available indigenously, fresh clean and suitable for the duties called upon.

#### 3.26.2 **Water Bar/ Seal/ Special Treatment of Construction Joint**

Water bearing structures and underground structures may have water bar/seals installed at the joints. They may be rubber or P.V.C. The materials and installation will be as

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described under Clause 3.23.3. Construction joint should be provided as per clause 3.13.1 with or without water bar / Seal as shown on the drawing. In case of water bars being used at the construction Joint, fixing of the same has to be done carefully so that the water bar is not disturbed during concreting. The construction joint shall also be treated by any one of the following methods.

Method 1 : A surface retarder in the form of a thixotropic gel shall be applied on the joint surface of the previous pour in case of joint on the wall and in case of floor the same shall be applied on the formwork against which previous pour of concreting shall be done. The retarder may be liquid or paste form depending on the type of formwork. The formwork shall be removed within 24 hours after concreting. Within 2 hours of striking of the formwork the retarder shall be washed off with strong water jet to make surface rough and clean. Then a rich cement mortar using cement, sand and aggregates (maximum size 8 mm) along with synthetic rubber emulsion type water resistant bonding agent shall be applied for a depth of 50 mm just before pouring the next stage of concreting in case of walls. The above bonding agent will be mixed with water which will be used for making the cement mortar. The proportion of mixing of this bonding agent with water shall be as per manufacturer's specification. In case of floor joint, however, after washing of retarder a solvent free two component epoxy resin bonding agent will be used at the joint before the next pour of concrete. The above bonding agent shall have the following properties after 28 days :


Compressive strength	-	55 to 60 N/Sq. mm
Flexural Strength	-	25 to 30 N/Sq. mm.
Tensile strength	-	15 N Sq. mm ( approx )
Bonding strength to concrete	-	3 N / Sq. mm ( approx )
Bonding strength to steel	-	20 N / Sq. mm ( approx)

The whole operation shall be done as per manufacturer's specification . The contractor shall provide manufacturer's supervision at no extra cost to the owner.

Method 2 : One row of threaded nozzles at regular intervals not exceeding 1.5 m centre to centre shall be placed in concrete along the construction joint during casting. Injection of cement water together with a suitable waterproof expanding grouting admixture of approved quality shall be done through the nozzles after the construction joint in walls and slabs. The injection shall be done under pressure of approximately 2 to 4 Kg/Sq cm . The nozzles shall be sealed off with suitable admixture after the injection is over. The whole operation shall be carried out as per manufacturer's specification and supervision. The cost of such manufacturer's supervision shall be borne by the contractor.

### 3.26.3

### **Waterproofing Admixtures**

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The waterproofing admixture for concrete and cement mortar / plaster shall conform to relevant IS code. The admixture shall not cause decrease of strength of concrete / plaster at any stage and it is free from chlorides and sulphates. The admixture shall not affect the setting time by more than 5 %.

The maximum permissible dosage of admixture will be 3% (three percent) by weight of cement but a lower dosage will always be preferred.

The product shall be stored in strong moisture proof packings.


However, in case of important structures where M25 or higher grade concrete is specified, and melamine based, high range water resistant concrete admixture is used to provide a waterproof concrete with cement content around 410 Kg/ Cu.m, a melamine based super plasticizer will be preferable.

- a) In concrete : The approved admixture shall be based on modified lignosulphonate like "Plastocrete - N/Super" or approved equivalent. The method of application and other details shall conform to the manufacturer's specification and/or as instructed by the Engineer. The Contractor shall have the services of the manufacturer's supervisor at no extra cost to the Owner to supervise the work, if desired by the Engineer.
- b) In Plaster : The concrete surface, to be plastered, shall be hacked to Engineer's satisfaction, cleaned thoroughly and kept wetted for 24 hours. The plaster shall be in cement sand mortar mixed in proportion varying from 1:1 to 1:4 by volume along with the approved waterproofing admixture like "Noleak CP/Sika Latex" or approved equivalent and laid in appropriate thickness and in layers not exceeding 15 mm/layer or as per manufacturer's specification. The additive shall be of quality and type approved by the Engineer. If desired by the Engineer, the Contractor shall have the work supervised by the manufacturer's supervisor at no extra cost to the Owner. On completion, the plastered surface shall be cured continuously for a minimum period of 14 days like concrete.

#### 3.26.4 Bituminous or Tar Coating on External Surface

The surface to be waterproofed shall be rendered absolutely dry, clean and dust free. The surface shall be sand papered, cleaned and completely coated with hot coal tar pitch of approved manufacturer and quality as per IS:216 (not heated above 375 Deg.F) using not less than 2 Kg. per Sq.M. or with hot asphalt i.e., bitumen according to IS:73 (not heated



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above 400 Deg.F) using not less than 1.5 kg. per Sq.M. When the first coat has completely dried up and approved by the Engineer, the second coat shall be applied in the same manner using not less than 1.25 Kg. per Sq.M. in case of coal tar and 1 Kg. per Sq.M. in case of asphalt. Immediately after application of the second coat and before it is dried up, sand shall be spread on the surface to cover it completely. Sufficient time shall be allowed after spreading of sand before backfilling is done in order to allow the final coat to dry up completely. In place of hot application by coal tar / asphalt the coating of the outside surfaces of walls may be carried out using a ready to use liquid, bituminous emulsion / rubber protective coating of approved manufacturer.

### 3.26.5 **Protective Coating on Inside Surface**

Two coats of cement based two component polymer modified flexible protective and waterproofing slurry having 1 mm thickness for each coat shall be applied on the walls/ floor after proper surface preparation as mentioned above. The slurry shall be applied by brush.

### 3.26.6 **Bitumen Felt : Application for Tanking**

This specification shall cover laying the waterproof course on the outside and inside of the walls and bases of structures.

The materials shall conform to IS:1322, and the workmanship to IS:1609. The bitumen felt shall be Hessian base and/or fibre base as specified in Drawing/Schedule of Items. If required by the Engineer, tests as specified in relevant IS Codes shall be arranged by the Contractor without charging any extra to the Owner.


The Contractor shall execute this work in direct collaboration with one of the well known specialised approved by the Engineer.

Cleaning the surface, keeping it dry, providing necessary corner fillets and cement rendering and cutting chases, etc. shall be included in the rate for this item. If any protective brickwork on/against concrete sub-bases or walls are required, these will be paid extra under suitable items in the contract. A 20 (twenty) years' guarantee for satisfactory performances shall be given by the Contractor as well as his specialist sub-contractor jointly and severally, for this item of work. Free rectification of any defects noted in the work within this guarantee period will be carried out by the Contractor even if it is beyond the specified maintenance period of the contract as a whole.

### 3.26.7 **Polyethylene Films : Application in Walls or base of Structures**

Waterproof treatment shall be applied as outlined and as per sequence given hereunder :

- i) the concrete surface shall be made smooth with 12 mm cement plaster 1:6
- ii) apply hot bitumen 80/100 grade (ref. IS:73) at the rate of 1.0 Kg/Sq.m minimum

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- iii) lay black polyethylene film 250 micron (IS:2508) with cut back bitumen adhesive in overlaps over hot bitumen surface, gently pressed, taking care not to puncture the film.

Alternatively, the overlaps shall be heat sealed by an electric iron having three parallel sealing bars. A long piece of plywood is to be placed below the polyethylene film to be heat sealed. On the plywood a rubber gasket is to be laid to provide a cushion for better welding of the film. On the rubber padding, a cellophane tape is to be spread and on this the LDPE film, with 100 mm overlap, is to be stretched. On the overlapped film another cellophane tape is to be placed to prevent the heat sealer from sticking to the LDPE film. After this, the electric iron is to be pressed on the overlap joint for sufficient time so as to allow perfect welding. The operation is to be repeated for subsequent lengths of joints. After heat sealing, the celophane tape is to be removed and the joints are to be tested for leaks.

- iv) Lay 100 gm brown craft paper laminated with a layer of straight run bitumen.
- v) Lay hot bitumen 80/100 grade (IS:73) at 1.0 Kg/Sq.m minimum.
- vi) Lay 250 micron polyethylene film as second layer similar to (iii) above.
- vii) Lay second layer of 100 gm. brown craft paper laminated similar to (iv) above.
- viii) Apply hot bitumen (straight run grade) to IS:73 at 1.0 Kg/Sq.m dusted with fine sand.
- ix) Protect with a layer of 75 mm plain cement concrete M-100, or a layer of brick laid in cement mortar 1:6. In case of wall apply a 12 mm thick plaster as shown on the drawing or a protective brick wall in 1:6 cement mortar as shown on the drawing.


### 3.27 **Protective coating on Concrete Surface**

#### 3.27.1 **On Foundation**

The outside faces of foundation of important structures will be protected from adverse effect of soil/ underground water, if shown on drawing or instructed by the Engineer, by using rubber / bitumen emulsion protective coating of approved manufacturer.

### 3.28 **Waterproofing by Pressure / Chemical Grouting**

Where required, waterproofing for underground concrete structure shall be done by injecting high polymer based non- shrink waterproof grouting compound through nozzle under pressure as per manufacturer's recommendation. The pressure during injection shall not be less than 2.5 kg/Sq.cm and the thickness of epoxy resinous emulsion waterproof paint (to be applied on the external surface of walls/slabs) shall not be less than 700 microns.

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## 4.0 **SAMPLING AND TESTING**

### 4.1 **General**

The Contractor shall carry out all sampling and testing in accordance with the relevant Indian Standards and as supplemented herein for the following items at his own cost unless otherwise specified in this specification. The Contractor shall get the specimens tested in a laboratory approved by the Engineer and submit to the Engineer the test results in triplicate within 3 (three) days after completion of the test.

### 4.2 **Cement**

Representative samples will be taken from each consignment of cement received from the manufacturer/supplier for carrying out the tests for fineness (by hand sieving), setting time and compressive strengths. Soundness Tests may also be required to be carried out if required by the Engineer. The tests shall be carried out free of charge by the Owner if cement is supplied by him. In case the Contractor is directed to arrange for the supply of cement as per the terms and conditions of the Contract the tests shall be carried out by him without any expense to the owner. In case due to any circumstances, the agency of supply is changed in the middle of the Contract, the party who bore the original contractual obligation will carry on with the test, free of charge to the other, till the end of the job. No cement from a particular consignment/batch will be used on the works unless satisfactory 3 (three) days and 7 (seven) days test results for compressive strength are known. The Owner, Engineer and Contractor will jointly associate themselves with the tests irrespective of whether they are carried out by the Owner or the Contractor. These tests are of great importance as their results will have a bearing on the acceptance of concrete or otherwise as per the terms and conditions of the Contract.

### 4.3 **Aggregates**


The Contractor shall carry out any or all the tests aggregates as may be required by the Engineer in accordance with IS:2386 PARTS-I to VIII. The acceptance criteria of the samples tested shall be in accordance with the requirements of the relevant Indian Standards.

### 4.4 **Water**

Sampling and Testing of water being used for concrete works as per IS:3550 will be carried out by the Contractor at regular intervals and whenever directed by the Engineer. The final acceptance criteria in case of doubt will be as per IS:3025 & IS:456.

### 4.5 **Admixture**

#### 4.5.1 **Air Entraining Agents (A.E.A)**

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Initially, before starting to use A.E.A., relationship between the percentage of air entrained and the cube crushing strength vis-a-vis quantity of A.E.A. used for all types of concrete will be established by the Contractor free of charge by carrying out sufficiently large number of tests. After than, at regular intervals and whenever directed by the Engineer, the Contractor will check up free of charge, the actual percentages of air entrained and corresponding crushing strengths to correlate with the earlier test results.

#### 4.5.2 **Other Admixtures**

Tests for establishing the various properties of any other admixtures which may be required to be added shall be carried out by the Contractor free of charge to the Owner.

#### 4.6 **Concrete**

The sampling of concrete, making the test specimens, curing and testing procedure etc. shall be in accordance with IS:516 and IS:1199 the size of specimen being 15 cm cubes. Normally, only compression tests shall be performed but under special circumstances the Engineer may require other tests to be performed in accordance with IS:516.

Sampling procedure, frequency of sampling and test specimen shall conform to IS:456.

To control the consistency of concrete from every mixing plant, slump tests and/or compacting factor tests in accordance with IS:1199 and as mentioned in Clause 3.6 of this Specification shall be carried out by the Contractor every two hours or as directed by the Engineer. Slumps corresponding to the test specimens shall be recorded for reference.

The acceptance criteria of concrete shall be in accordance with the relevant Clause of IS:456.

Concrete work found unsuitable for acceptance shall have to be dismantled and replacement is to be done as per specification by the Contractor. No payment for the dismantled concrete, the relevant formwork and reinforcement, embedded fixtures, etc. wasted in the dismantled portion shall be made. In the course of dismantling, if any damage is done to the embedded items or adjacent structures, the same shall be made good, free of charge by the Contractor, to the satisfaction of the Engineer.


#### 5.0 **ACCEPTANCE CRITERIA**

##### 5.1 **Standard Deviation**

Standard deviation shall be based on test results and determination of Standard deviation shall conform to IS:456.

##### 5.2 **Acceptance Criteria**

The strength requirements and acceptance criteria shall conform to Clause 16 of IS:456.

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### 5.3 **Inspection and Core Tests**

Inspection of concrete work immediately after stripping the formwork and core test of structures shall conform to Clause 17 of IS:456.

### 5.4 **Load Test**

Load tests of structural members may be required by the Engineer, when the strength of test specimen results fall below the required strength, as per Clause 17.6 of IS:456. If load testing is decided by the Engineer, the member under consideration shall be subjected to a test load equal to 1.25 (one and a quarter) times the specified live load used for design and this load shall be maintained for a period of 24 (twenty four) hours before removal. The detailed procedure of the test is to be decided by the Engineer. Load tests shall not be made until the structure is at least 56 days old.

If the member shows evident failure, such changes as are necessary to make the structure adequately strong shall be made by the Contractor free of cost to the Owner. Alternatively, if permitted under Statutory Regulations and at the discretion of the Engineer, the structure under test or a portion thereof may be retained as such without any modification by derating its load bearing capacity, provided the design criteria allows such derating.


A reinforced concrete beam, floor or roof shall be deemed to have passed the test if the maximum deflection at the end of 24 hours does not exceed the deflection given in Clause 17.6 of IS:456.

The entire cost of load testing shall be borne by the Contractor. If a portion of the structure is found to be unacceptable, it shall be dismantled and replaced by a new structure as per specification. The entire cost of dismantling and replacement and restoration of the site being borne by the Contractor.

If, in the course of dismantling, any damage is done to the embedded items and or other adjacent structures, the same will be made good, free of charge by the Contractor to the satisfaction of the Engineer.

### 6.0 **RATES**

The rate for any item in the schedule, unless specifically excluded in the contract shall be deemed to include the cost of all materials consumed or used in the work or incidental to it as well as labour, tools, plants, equipment, templates, supports, scaffolds, approaches, security and safety measures, power, fuel, lubricants, storage, handling, transport, testing, insurances, taxes, royalties and other revenue expenses, accommodation, services, supervision, overheads, profits etc. The various items of work which are to be provided are mentioned under Clause 2.1 and elsewhere in this specification. If no separate item is provided for any such work in the schedule of items, it is implied that the contractor shall

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not claim for any of the connected items of the schedule viz., detailed drawings and drawing of formwork in the item of formwork or concrete etc.

## 7.0 **METHOD OF MEASUREMENT**

### 7.1 **Concrete**

- a) Actual volume of work at executed or as per drawings issued, whichever is less, shall be measured in Cu.m. Deductions for openings, conduits, pipes, ducts, pockets, chases etc. shall be made, provided they are larger than 0.1 Sq.m. in area each.

No deduction shall be made for embedded fixtures including reinforcements, sleeves, anchor bolts and similar items.


- b) Precast concrete work shall be measured in the same way as specified in foregoing paragraph. No separate payment shall be made for formwork. Lifting hook where required in the design, shall be treated as reinforcement steel and paid accordingly. Payment shall be due only after derection, grouting and curing of the precast units in proper position unless otherwise provided for in the contract. All breakages and damages of the precast units will be to the Contractor's account and shall be replaced free of charge in the Owner.

### 7.2 **Admixture**

Admixture will be measured on the basis of theoretical requirement or actual consumption, whichever is less.

### 7.3 **Reinforcement**

- a) Bar or any other type of reinforcement used like hard drawn steel wire fabric etc. for reinforced concrete shall be measured by weight in Tonnes. The weight will be arrived at by multiplying the actual or theoretical length, whichever is less, by the sectional weights. In case the Owner issues the reinforcing steel, the sectional weight will be the same as were applied at the time of issue. In case the steel is to be supplied by the Contractor, the sectional weight to be adopted will be the I.S. Sectional Weight or as per actuals which will be arrived at by accurately measuring representative samples as directed by the Engineer, whichever is less.
- b) Standard hooks, cranks, bends, authorised laps etc. shall be measured.
- c) Lap welding or butt welding if permitted will be measured diameterwise per joint. The actual length of steel in lap will be measured separately in case of lap welding. The rate quoted for the smaller size bar will be applied in case of joint between two bars of different diameters.

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- d) Separator pieces between two or more layers of steel shall be measured.
- e) No payment shall be made for binding wires, spacer block, supports, chairs, hangers, etc. of height 300 mm and less, required for keeping the steel in position unless otherwise specified in the contract. For supporting horizontal reinforcement at heights larger than 300 mm support drawings will be prepared by the Contractor and payment will be made for the supports as approved by the Engineer, or as actually placed, whichever is less, at the same rate as for reinforcement.
- f) No extra will be paid for modification of already embedded reinforcement, if required due to faulty fabrication or placement.
- g) Dowels neither shown on the drawings nor instructed by the Engineer, but required for construction facilities and/or sequence, shall not be measured.

#### 7.4


#### **Formwork**

- a) Formwork shall be measured as the actual surface in contact with the concrete and paid in Sq.m. unless included in the rate for concrete.
- b) Formwork shall not be measured separately for precast concrete work, which shall be included in the concrete rates.
- c) No payment for formwork or any other requirements in construction joints shall be made.
- d) Openings upto 0.1 Sq.m. shall be neglected as if non-existent for the purpose of formwork measurement.
- e) No extra measurement or payment shall be made for making the formwork waterproof or for supports, scaffolding, centering, approaches, etc.
- f) No measurement shall be taken for the formwork in pockets, openings, chases etc. in concrete if the crosssectional area is less than or equal to 0.1 Sq.m. in each set. If the cross-sectional area of any opening exceeds 0.1. Sq.m. the formwork shall be measured under appropriate classification.
- g) Fixing and removing pockets and openings of sectional area less than 0.1 Sq.m. shall be measured on number basis and paid separately.

#### 7.5

#### **Anchor Bolts, Sleeves, Inserts, Hangers, Conduit Pipes and Other Miscellaneous Embedded Fixtures**

- a) There will be measured on theoretical weight basis of the complete insert handled by the Contractor irrespective of the amount of insertion. Where theoretical weight

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cannot be assessed satisfactorily, the actual weight shall be allowed under certification of the Engineer.

- b) No extra shall to be paid for templates and other arrangements required to secure there in position. The protection of these materials with proper anticorrosive paints/grease and covering with gunny bags against any damages till the structure is handed over, shall be the responsibility of the Contractor at no extra cost.
- c) Any 'boxing' left for inserts etc. during construction, for facility of the Contractor's work, and later on filled in by the same Contractor after placing the insert shall be considered for measurement purpose as if the inserts, etc, were placed before concreting.
- d) No extra payment shall be made for cleaning of the inserts, etc. required for bond with the concrete.

7.6

#### **Expansion and Isolation Joints**


- a) Expansion and isolation joints will be measured and paid on area basis. The drawings and or schedule of items will describe the thickness, painting, filling material, sealing strips, metal fixtures, inserts, etc. to be used in the joint.
- b) Formwork for the 'leading side' of the joint will be measured and paid under the relevant item. No payment for the formwork for the 'following side' will be made even if the Contractor is required to use formwork for constructional facilities.
- c) Joints sealing strips made out of Copper, Aluminium or G.I. or P.V.C. or rubber will be measured and paid on area basis under relevant items. Rubber pads below foundation will be measured on area basis under the relevant item.
- d) Any other fixtures and inserts like dowels, installed as per drawing, riding plates etc. will be measured and paid if under the respective items of the Schedule of Items.
- e) All other work like installing Bitumen coating, Bitumen boards. Expanded Polystyrene Boards, Alkathene sheets, Bitumen filler etc. and trimming the top, repairs, finishes and other connected item will be deemed to be included in the unit rate for Expansion / Isolation Joints.

7.7

#### **Joint Seals : G.I. Copper, Aluminium, Rubber or P.V.C.**

All seals, whether used at water bars or in Expansion or Isolation joints shall be measured as joint seals and on area basis. In case of Metallic seals like G.I., Copper or Aluminium the developed area will be measured. In case of Rubber and P.V.C. seals also, developed area will be measured but the central bulb, corrugation ribs etc. will be neglected. In all cases laps will not be measured.



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**7.8 Rubber Pad**

Rubber pads will be measured on area basis. The theoretical or actual area, whichever is less will be recorded.

**7.9 Grouting under Base Plates etc.**

Grouting shall be measured on theoretical volume basis neglecting the volume of embedded items. The cost shall include the cost of hacking the old concrete plus necessary formwork if any Edges of the grouting shall be measured square even if chamfered. Necessary curing shall also be included Admixtures, if added, will be measured and paid separately under the relevant items.

**7.10 Waterproof Plaster**

The measurement will be on finished square area basis. The thickness, method of applications, waterproofing additive to be used etc. will be specified in the specification/drawings/schedule of items.

The waterproofing additive will be measured and paid separately under admixtures (Clause 7.2). No deduction will be made for opening less than 0.1 Sq.m. in area each.

**7.11 Bitumen Coating / Tar Coating / Bituminous or Rubber Protective Coating**

These shall be measured on nett useful area, neglecting openings upto 0.1 Sq.m. in area each.


**7.12 Bitumen Felt**

Bitumen felt waterproofing shall be measured nett on area of structure covered, neglecting openings upto 0.1 Sq.m. in area each, measuring only once for the completed work and not once for each layer.

**7.13 Polyethylene Film**

Polyethylene Film waterproofing shall be measured nett on area of structure covered, neglecting openings upto 0.1 Sq.m. in area each measuring only once for the completed work and not once for each layer.

**7.14 Tests**

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- a) Tests on concrete specimens shall be paid according to number of specimens tested. The specimen shall be either in the form of 15 cm cubes or 15 cm dia., 30 cm long cylinders. No separate measurement shall be made for volume of concrete used in the specimen or for the mould.
- b) No payment shall be made for tests carried out for approval of samples of different materials in accordance with the specification.
- c) Load Test, if required to be made as per terms and conditions of the contract shall not be paid.

8.0


#### **LIST OF I.S. CODES AND STANDARDS FOR REFERENCE**

All work under this specification shall, unless specified otherwise, conform to the latest revisions and/or replacements of the following or any other Indian Standard Specifications and Codes of Practice. In case any particular aspect of work is not specifically covered by Indian Standard Specifications, any other standard practice, as may be specified by the Engineer, shall be followed :-


- IS : 73 - Indian Standard Specification for Paving Bitumen
- IS : 216 - Indian Standard Specification for Coal Tar Pitch
- IS : 269 - Indian Standard Specification for 33 grade Ordinary Portland Cement
- IS : 383 - Indian Standard Specification for Coarse and Fine Aggregates from Natural Sources for Concrete
- IS : 432 - Indian Standard Specification for Mild Steel and Medium Tensile Steel Bars and Hard Drawn Steel Wire for concrete Reinforcement - Part 1 & 2
- IS : 455 - Indian Standard Specification for Portland Slag Cement
- IS : 456 - Indian Standard Code of Practice for Plain and Reinforced Concrete
- IS : 457 - Indian Standard Code of Practice for General Construction of Plain and Reinforced Concrete for Dams and other Massive Structures
- IS : 516 - Indian Standard Specification for Methods of Test for Strength of Concrete
- IS : 737 - Indian standard specification for wrought Aluminium and Aluminium Alloy sheet and strip for general Engineering purpose. IS:1199-Indian Standard Specification for Methods of Sampling and Analysis of Concrete
- IS : 1200 - (Part-II) : Indian Standard Specification for Method of Measurement Cement Concrete Works.

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- IS : 1200 - (Part-V) : Indian Standard Specification for Method of Measurement of Formwork
- IS : 1322 - Indian Standard Specification for Bitumen Felts for Waterproofing and Damp-proofing
- IS : 1489 - Indian Standard Specification for Portland - Pozzolona Cement - Part 1 & 2
- IS : 1566 - Indian Standard Specification for hard drawn steel wire fabric for concrete reinforcement.
- IS : 1609 - Code of Practice for Laying Damp-proof Treatment using Bitumen Felts
- IS : 1786 - Indian Standard Specification for high strength deformed Bars & wires for Concrete Reinforcement
- IS : 1791 - Indian Standard Specification for Batch Type Concrete Mixers
- IS : 1834 - Indian standard specification for hot applied sealing compound for joint in concrete.
- IS : 2062 - Steel for general structural purpose.
- IS : 2185 - Indian Standard Specification for Hollow and solid/solid light wt. Cement Concrete Blocks - Part - 1 & 2
- IS : 2210 - Indian Standard Specification for Design of Reinforced Concrete Shell Structures and Folded Plates
- IS : 2386 - Indian Standard Specification for Methods of Test for Aggregates for Concrete - Part-I to VIII
- IS : 2430 - Indian standard specification for method of sampling of Aggregate for concrete.
- IS : 2502 - Indian Standard Code of Practice for Bending and Fixing of Bars for Concrete Reinforcement
- IS : 2505 - Indian Standard Specification for Concrete Vibrators Immersion Type
- IS : 2506 - Indian Standard Specification for Screed Board Concrete Vibrators
- IS : 2514 - Indian Standard Specification for Concrete Vibrating Tables
- IS : 2645 - Integral Cement water proofing compound

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- IS : 2722 - Indian Standard Specification for Portable Swing Weigh Batchers for Concrete (Single and Double Bucket type)
- IS : 2751 - Code of Practice for Welding of Mild Steel Bars used for Reinforced Concrete Construction
- IS : 2770 - Indian Standard Specification for Method of Testing Bond in Reinforced Concrete. Part - 1 : Pull out Test
- IS : 3025 - Indian Standard Specification for Methods of Sampling and Test (Physical and Chemical) for Water & waste water - art - 1 to 37
- IS : 3201 - Indian Standard Specification for Design and Construction of Precast Concrete Trusses and purlins.
- IS : 3370 - Indian Standard Specification for Code of Practice for Concrete Structures for Storage of Liquids Part 1 to 4
- IS : 3384 - Indian standard specification for / Bitumen primer for use in waterproofing and Danp proofing
- IS : 3414 - Code of practice for Design and Installation of joints in Buildings
- IS : 3550 - Indian Standard Specification for Method of Test for Routine Control for Water used in Industry
- IS : 3558 - Code of Practice for use of Immersion Vibrators for Consolidating Concrete
- IS : 3696 - Safety Code for Part-1 : Scaffolding and Part 2: Ladders
- IS : 3812 - Indian Standard Specification for Fly Ash for Use as Pozzolone & Admixture
- IS : 4031 - Indian Standard Specification for Method of Tests for Hydraulic Cement - Part - 1 to 14
- IS : 4082 - Indian Standard Specification for Recommendation on Stacking and Storage of Construction Materials at site
- IS : 4090 - Indian Standard Specification for Design of Reinforced Concrete Archs
- IS : 4634 - Indian Standard Specification for Method of Testing Performance of Batch-type Concrete Mixers
- IS : 4656 - Indian Standard Specification for Form Vibrators for Concrete

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- IS : 4925 - Indian Standard Specification for Concrete Batching and Mixing Plant
- IS : 4926 - Indian Standard Specification for Ready Mixed Concrete
- IS : 4990 - Indian Standard Specification for Plywood for Concrete Shuttering work
- IS : 4991 - Indian Standard Specification for Blast Resistant Design of Structure for Explosion above ground
- IS : 4995 - (Part-I & II) : Indian Standard Specification for Design of Reinforced Concrete Bins for the Storage & of Granular and Powdery Materials
- IS : 4998 - (Part - I) : Indian Standard Specification for Design of Reinforced Concrete Chimneys
- IS : 5512 - Indian Standard Specification for Flow Table for use in Tests of Hydraulic Cement and Pozzolanic Materials
- IS : 5513 - Indian Standard Specification for Vicat Apparatus
- IS : 5515 - Indian Standard Specification for Compaction Factor Apparatus
- IS : 5751 - Indian Standard Specification for Precast Concrete Coping Blocks
- IS : 5816 - Indian Standard Specification for Method of Test for Splitting Tensile Strength of Concrete Cylinders
- IS : 5891 - Indian Standard Specification for Hand Operated Concrete Mixers
- IS : 6452 - Indian Standard Specification for High Alumina Cement for Structural Use
- IS : 6909 - Indian Standard Specification for Supersulphated Cement
- IS : 6923 - Indian Standard Specification for Method of Test for performance of Screed Board Concrete Vibrators
- IS : 6925 - Indian Standard Specification for Method of Test for Determination of Water Soluble Chloride in Concrete Admixtures
- IS : 7242 - Indian Standard Specification for Concrete Spreaders
- IS : 7246 - Indian Standard Specification for Table Vibrators for Consolidating Concrete
- IS : 7251 - Indian Standard Specification for Concrete Finishers

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- IS : 7320 - Indian Standard Specification for Concrete Slump Test Apparatus
- IS : 7861 - (Part-I & II) : Indian Standard Specification for Recommended Practice for hot and cold & Weather Concreting
- IS : 7969 - Safety Code for Storage and Handling of Building Materials
- IS : 8041 - Indian Standard Specification for Rapid Hardening Portland cement
- IS : 8043 - Indian standard specification for hydrophobic cement
- IS : 8112 - Indian Standard Specification for 43 grade Ordinary Portland Cement
- IS : 8142 - Indian Standard Specification for Determining Setting time of Concrete by Penetration Resistance
- IS : 8989 - Safety Code for Erection of Concrete Framed Structures
- IS : 9013 - Indian Standard Specification for Method of Making, Curing and Determining Compressive Strength of Accelerated - cured Concrete Test Specimens
- IS : 9077 - Code of Practice for Corrosion Protection of Steel Rails in RB and RCC Construction
- IS : 9103 - Indian Standard Specification for Admixtures for Concrete.
- IS : 9417 - Recommendation for welding cold worked bars for reinforced concrete construction
- IS : 10262 - Recommended Guideline for concrete Mix Design
- IS : 12269 - Indian standard specification for 53 grade ordinary portland cement
- IS : 12330 - Indian standard specification for sulplate resting portland cement
- IS : 12600 - Indian standard specification for low heat portland cement

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All work for civil items shall be carried out as per latest Indian standard and civil Specification which shall form part of this Specifications and Instructions of the Engineer-in-charge in case of conflict or where any aspect of work is not covered by the Indian Standard and civil Specification Engineer's decision shall be final and binding .

**A : Scope of Work**

- 1. MCC building 9.00 Mtr high including cable trenches, transformer room , false floor etc.**
- 2. RCC approach and drain surrounding paddock**
- 3. Crane foundations**
- 4. Mill foundation**
- 5. Control room**
- 6 . Other misc works**

**B: Technical specification :**


- 1. All the works shall be carried out strictly as per CPWD specification and latest IS codes.**
- 2. All reinforcement shall be used of TISCO / SAIL of grade Fe 415 or Fe 500 .**
- 3. Cement to be used LAFARGE / ACC**
- 4. Admixture used if any in design mix & Alkathene /PVC sheet required if any for separation will be used by contractor at their own cost.**
- 5. All the testing and its charges of materials, concrete cubes etc shall be arranged / borne by the contractor at their own cost.**
- 6. Frequency of testing shall be as per specification / direction of EIC**

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## **SECTION – VIII**

### **SAFETY OF CONTRACTOR’S EMPLOYEES**



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### **SAFETY OF CONTRACTOR'S EMPLOYEES**

1.0 The Contractor shall at all times, take all reasonable precautions for the safety of employees, including those of sub-contractors in the performance of his contract and shall comply with all applicable provisions of both central as well as the state Safety Laws, in additions, to the safety provision already included the Safety requirements recommended by the V. T. Centre, Narwapahar/Turamdih for a specific contract.

In the event that the contractor fails to comply with these provisions the engineer-in-charge may, without prejudice to any other legal or contractual rights, issue an order stopping all or any parts of the work, thereafter a start order for resumption of work may be issued at the discretion of the contracting office. The contractor shall make no claim for an extension of time or stoppage.

2.0 Contractor shall have a full time Safety office/Engineer when the contractor employees 500 or more persons or when engaged in specially hazardous work. In the case of contractors employing fewer than 500 persons his safety representative shall be employed in high supervisory capacity and his safety duties may be in addition to other technical or administrative duties.

3.0 Contractor shall have at least one person fully trained in First-Aid present at the site of work all the times.

4.0 Contractors must report to the V. T. Centre, Narwapahar/Turamdih through their Engineer-in-charge every accident involving

- their personnel
- UCIL property or personnel
- Property or personnel of other contractors working on the site

4.1 Contractor must report to V. T. Centre Narwapahar/Turamdih through immediately on becoming aware of any accident of Type – A (See Appendix – 1) giving the following information


Name of the informant

Nature and location of incident being reported

Name of Supervisor/Engineer-in-charge, Location and Telephone no. where he can be reached

4.1.1 Contractor shall submit their investigation reports, through their engineer-in-charge, to V. T. Centre immediately but not later than three working days after the occurrence of accident in the Form – A (See Appendix – 2)

4.2 In the case of Type – B accidents (See Appendix – 1), Contractor shall submit their investigation reports, through their Engineer-in-charge, to V. t. Centre immediate but not later than three working days after the occurrence of accident in the Form-A.


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4.3 Monthly summary of accidents and cases of fire shall be prepared by each contractor in Form – B (See Appendix – 3) and be sent to V. T. Centre, Narwapahar/Turamdih by the seventh of next month.

4.3.1 Principal contractor shall report the man days lost and occurrence of accidents under the jurisdiction of sub-contractors.

4.3.2 Contractor shall submit a narrative report on Safety activities and fire incidents for each month along with Form – B. The review should contain such items as personnel and programme change, major project started and major problems.

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APPENDIX - 1  
CLASSIFICATION OF ACCIDENTS

Type - A

1. Fatal Injuries
2. Serious injuries such as fracture, dislocation severe burns etc necessitating hospitalization.
3. Any injury to give or more persons
4. Accidents resulting in damage by fire, explosion etc

Type - B

3. Minor injuries which result in laceration, abrasion, contusion
2. Disabling injuries but not requiring hospitalization.

APPENDIX - 2  
(F O R M - A)  
CLASSIFICATION OF ACCIDENTS

Name of the Contractor & project :

Nature of the contract :

Name of the engineer-in-charge :

Name of injured person :

Age :

Date & Time of Accident occurred :

Nature of job :

What was the injured person doing  
On the time of accident :

Description of accident (in detail) :


What was defective or in wrong  
condition that was responsible for  
the accident? :

What was wrong with working  
methods/instructions ? :

What steps should be taken to prevent  
Recurrence of such accident :

Name of the witnesses : 1.  
2.

Safety representative's remarks with  
Signature and date :

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APPENDIX - B  
(FORM - B)  
SUMMARY OF ACCIDENT FOR THE MONTH OF

Name of the project :

Name of the safety representative of  
The project :

Name of the Contractor ;

Name of the sub-contractor :

Total No. of person working in the  
Project :

Male :

Female :

Engineers :

Supervisors :

Labourers :

Total No. of Accidents (including  
Type – A & Type – B) :


Disabling injuries :

Non Disabling injuries :

	No.	No. of days lost/charges
Agency		
Machine		
Handling materials		
Fall of persons		
Hand Tools		
Fire/Explosion		
Collapse of excavation/structure		
Electrical shock/burn		
Miscellaneous		

Remarks:

Signature of Safety Representative


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## **SECTION – IX**

### **DRAWINGS**


The scope of work / drawings are only to give general idea of works. Construction drawings for the job shall be released after award of work.

1. Drawing No. : UCT-1B/MECH/MAG.PLANT/40 REV 4
2. Drawing No. : UCT-1B/MECH/MAG.PLANT/43 REV 0
3. Drawing No. : UCT-1B/MECH/MAG.PLANT/41 REV 3
4. Drawing No. : UCT-1B/MECH/MAG.PLANT/42 REV 3
5. Drawing No. : UCT-1B/MECH/MAG.PLANT/44 REV 0

	<p><b>URANIUM CORPORATION OF INDIA LIMITED</b>  <b>(A Government of India Enterprise)</b>  <b>Turamdih Mill Project</b>  <b>Jharkhand -832107</b></p>	<p><b>NIT NO.</b>  <b>TMD/ 541</b></p>
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## **PART – II**

## **PRICE PART**

	<p><b>URANIUM CORPORATION OF INDIA LIMITED</b>  <b>(A Government of India Enterprise)</b>  <b>Turamdih Mill Project</b>  <b>Jharkhand -832107</b></p>	<p><b>NIT NO.</b>  <b>TMD/ 541</b></p>
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