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NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited

Ref: Date: --/--/----

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NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES OR PURCHASE TENDERS FROM THIS OFFICE ALSO

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To

Dear Sir/Madam

Sub : NOTICE INVITING TENDER

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHEL/NR/SCT/RAPP KOTA-CCI PCKG/ENABLING WORKS/978**	
ii	**Broad Scope of job**	**"Construction and Development of BHEL Closed Storage Sheds with office -01 no (900 sqmt) & 01 no. closed shed without office (720 sqmt) for 2 X 700 MW NPCIL Rawatbhata Atomic Power Plant at Kota,Rajasthan"**	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
b	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
c	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
d	Volume-ID	*Forms and Procedures*	*Applicable*
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :*** ***Start : 13/11/2014 , Time :0900 Hrs (IST)*** ***Closes: 5 /12/2014 , Time : 1200Hrs (IST)*** **2. From BHEL website (www.bhel.com)** Tender documents will be available for downloading from website till due date of submission	*Applicable/*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 5 /12/2014, Time :1500 Hrs (IST)*** ***Place : BHEL-PSNR-Noida***	*Applicable*
vi	**OPENING OF TENDER**	***Date : 5 /12/2014,*** *(within 2 hours of the latest due date and time of offer*	*Applicable*

		submission). *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender*	
vii	**EMD AMOUNT**	*Rs 2,00,000/-*	*Applicable*
viii	**COST OF TENDER**	*Rs 2000/-.*	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Date: **24 /11/2014*** *Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**		*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**		*Not Applicable*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) **and not in the newspapers**. Bidders to keep themselves updated with all such information	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Noida issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Noida, Sundays and second/ last Saturdays

4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida. For other details and for 'One Time EMD' please refer General Conditions of Contract.

5.0 **Procedure for Submission of Tenders**: The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
- One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped)**

Sl no	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above. **Note:** a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii.	Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

	PART-I B	
	ENVELOPE – II superscribed as: PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK :	

	PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender **OR** Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender 2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	OUTER COVER	
	ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING:**	
i	o Envelopes I o Envelopes II o Envelopes III	

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 Assessment of Capacity of Bidders:

Bidders capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:

I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

i). Total number of Packages
Total number of Packages in hand = P
Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (**under execution**/ executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(**Note**: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, for all the unit wise identified packages (refer Table I)

i). Calculation of Overall 'Performance Rating' for 'similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':
This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

a) P_1, P_2, P_3 , P_4 , P_5 , …. P_N etc be the packages (**under execution**/ executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = $\mathbf{P_T}$ (ie $P_T = P_1 + P_2 + P_3 + P_4 + .. P_N$)

b) Number of Months 'T_1' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package P_1. Similarly T_2 for package P_2, T_3 for package P_3, etc for the tendered scope. Now calculate cumulative total months '$\mathbf{T_T}$' for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + .. T_N$)

c) Sum 'S_1 ' of 'Monthly Performance Evaluation' Scores ($S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, $S_{1\text{-}5}$,…. $S_{1\text{-}N}$) for similar package P_1, for the 'period of assessment' 'T_1' (i.e $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + \ldots S_{1\text{-}N}$). Similarly S_2 for package P_2 for period T_2, S_3 for package P_3 for period T_3, etc for the tendered scope for all Regions. Now calculate cumulative sum 'S_T' of 'Monthly Performance Evaluation' Scores for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e 'S_T'= $S_1 + S_2 + S_3 + S_4 + S_5 + \ldots S_N$.)

d) **Overall Performance Rating** '$\mathbf{R_{BEHL}}$' **for the similar Package/Packages** (**under execution**/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL)**:**

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{---}}$$

Aggregate of months for each of the similar package for which performance should have been evaluated in all the Regions

$$= \frac{S_T}{T_T}$$

e) Bidders to note that the risk of non evaluation or non availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder

f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl no	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P_1	P_2	P_3	P_4	P_5	…	P_N	Total No of similar packages for all Regions = $\mathbf{P_T}$ ie Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment for corresponding similar Package (as in row 1)	T_1	T_2	T_3	T_4	T_5	…	T_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{T_T}$
3	Monthly performance scores for the corresponding period (as in Row 2)	S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, … S_{1-T1}	S_{2-1}, S_{2-2}, S_{2-3}, S_{2-4}, … S_{2-T2}	S_{3-1}, S_{3-2}, S_{3-3}, S_{3-4}, … S_{3-T3}	S_{4-1}, S_{4-2}, S_{4-3}, S_{4-4}, … S_{4-T4}	S_{5-1}, S_{5-2}, S_{5-3}, S_{5-4}, … S_{5-T5}	.. … … … …	S_{N-1}, S_{N-2}, S_{N-3}, S_{N-4}, … S_{N-TN}	---
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S_1	S_2	S_3	S_4	S_5	…	S_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{S_T}$

ii) Calculation of Overall 'Performance Rating' ($\mathbf{R_{BHEL}}$) in case 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. 'R_{BHEL} ' shall be calculated subject to availability of 'performance scores' for at least.6 'package months' in the order of precedence below:

a) 'Period of Assessment.
b) 12 months preceding the cut-off month
c) 24 months preceding the cut-off month
d) 36 months preceding the cut-off month

In case, R_{BHEL} cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'

iii) Factor "L" assigned based on Overall Performance Rating (R_{BHEL}) at Power Sector Regions,:

Sl no	Overall Performance Rating (R_{BHEL})	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.4
3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

III. 'Assessment of Capacity of Bidder':

'Assessment of Capacity of Bidder' is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages P_{Max}= (R_{BHEL}- 60) divided by corresponding value of 'L'
i.e. (R_{BHEL}- 60)/L

Note:

i. In case the value of P_{Max} results in a fraction, the value of P_{Max} is to be rounded off to next whole number
ii. For R_{BHEL} = 60 , P_{Max} = '1'
iii. For R_{BHEL} ≥ 80, there will be no upper limit on P_{Max}

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if P ≤ P_{Max}
(where P is calculated as per clause 9.I)

IV. **Explanatory note**:

a) Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, etc at the individual level irrespective of rating of Plant, and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, CI, Civil, Structure, etc is considered individual level of package. For example in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e the 'identified packages as per Table-1 below), the 'PERFORMANCE' part against sl no II above, needs to be evaluated considering all the identified packages (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above

b) Identified Packages (Unit wise)

Table-1

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI from BHEL.

The "FIRST TIMER" tag shall remain till execution of work for a period of not less than 09 months, from the commencement of work of first package

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Capacity Evaluation of Bidders'.

d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating 'R_{BHEL}'** only, starting from the upper band.

e) 'Under execution' shall mean works in progress as per the following:

i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries

ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)

iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

Note : BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (i), (ii) and (iii) above, depending upon the balance scope of work to be completed.

f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

10.0 Since the job shall be executed at site**,** bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**

16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.

19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 **Not Used**

24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of **banned firms** is available on BHEL web site www.bhel.com.

27.0 BHEL reserves the right to go for **Reverse Auction (RA**) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid" in the Reverse Auction. Non-submission of „online sealed bid" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue."

Information and General Terms and Conditions governing RA shall form part of the RFQ/ Enquiry.

28.0 It may please be noted that **guidelines/rules** in respect of Suspension of Business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', etc may **undergo change** from time to time and the latest one shall be followed.

29.0 **Micro and Small Enterprises (MSE)**

Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer

Type under MSE	SC/ST owned	Others
Micro		
Small		

Note: - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3 where deemed validity of EM-II certificate of five years has expired) applicable for the relevant financial year (last audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. .

30.0 Order of Precedence

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

for BHARAT HEAVY ELECTRICALS LTD
(SCT)

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List.
03. Annexure-3: Chartered Accountant certificate for MSMED
04. Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING REQUIREMENTS

JOB	**"Construction and Development of BHEL Closed Storage Sheds with office -01 no (900 sqmt) & 01 no. closed shed without office (720 sqmt) for 2 X 700 MW NPCIL Rawatbhata Atomic Power Plant at Kota,Rajasthan"**
TENDER NO	**BHEL/NR/SCT/RAPP KOTA-CCI PCKG/ENABLING WORKS/978**

S. NO.	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no. of supporting document
A	**Submission of Integrity Pact duly signed**	**Not Applicable**	
B	**Assessment of Capacity of Bidder to execute the work as per sl. no. 9 of NIT**	**Applicable (BY BHEL)**	
C	**Technical** Bidder who wish to participate should have executed, during last seven years, as on the date of opening of Technical Bid, works of similar nature covered in this tender as per the following: One single work of valuing Rs. 120 lacs or above. "OR" Two works of valuing each of Rs. 75 lacs or above. "OR" Three works of valuing each of Rs. 60 lacs or above.	**Applicable**	
D 1.1 1.2	**Financial** **TURNOVER:** Bidders should have achieved an average annual financial turnover (Audited) of Rs. 45 lacs or more over the last three financial years (FY) i.e. 2011-2012, 2012-2013, 2013-2014. **Net worth**: Net worth of the bidder based on the latest audited accounts as furnished for D 1.1 above should be positive. **Profit:** Bidder should have earned cash profit in any one of the three financial years as applicable in the last three financial years defined in D 1.1 above based on latest audited accounts. (Relevant documents, meeting above requirements at C & D, shall be submitted by bidders.)	**Applicable**	
E	**Approval of Customer**	**Not Applicable**	
F	**Consortium criteria**	**Not Applicable**	
	Explanatory Notes for QR 'C' • For QR 'C' above the word 'Executed' means the bidder should have achieved the criteria, specified in the QR, even if the total contract has not been completed or closed. • If the Qualifying work is executed in the last seven years period, as specified above, even if it has been started earlier, the same will also be considered meeting the qualifying requirements. • The word "work of similar nature" means Civil works like Construction and Development of Covered / Semi Covered Stores OR Offices OR Buildings (Industrial / Residential/Commercial).		

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK OREDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

ANNEXURE - 2

CHECK LIST

NOTE:- Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / ~~NO~~
7	Audited profit and Loss Account for the last three years	Applicable/~~Not Applicable~~	YES/~~NO~~
8	Copy of PAN Card	Applicable/~~Not Applicable~~	YES/~~NO~~
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/~~Not Applicable~~	YES/~~NO~~
10	Integrity Pact	~~Applicable~~/Not Applicable	~~YES~~/NO
11	Declaration by Authorised Signatory	Applicable/~~Not Applicable~~	YES/~~NO~~
12	No Deviation Certificate	Applicable/~~Not Applicable~~	YES/~~NO~~
13	Declaration confirming knowledge about Site Conditions	Applicable/~~Not Applicable~~	YES/~~NO~~
14	Declaration for relation in BHEL	Applicable/~~Not Applicable~~	YES/~~NO~~
15	Non Disclosure Certificate	Applicable/~~Not Applicable~~	YES/~~NO~~
16	Bank Account Details for E-Payment	Applicable/~~Not Applicable~~	YES/~~NO~~
17	Capacity Evaluation of Bidder for current Tender	Applicable/~~Not Applicable~~	YES/~~NO~~

18	Tie Ups/Consortium Agreement are submitted as per format	~~Applicable~~/Not Applicable	~~YES~~/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/~~Not Applicable~~	YES/~~NO~~
20	Analysis of Unit rates	Applicable/~~Not Applicable~~	YES/~~NO~~

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

ANNEXURE - 3

Certificate by Chartered Accountant on letter head

This is to Certify that M/S ..... , (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part—II) ..... dtd:..... , Category: ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No. S.O.1722(E) dated October 5, 2006:
   Rs.....Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the **MSMED** Act, 2006:
   Rs.....Lacs

(Strike off which is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs for ..... Micro / Small **(Strike off which is not applicable)**

Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is ..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

ANNEXURE - 4

GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit "online sealed bid" in the Reverse Auction. Non submission of "online sealed bid" by the bidder for any of the eligible items for which techno commercially qualified, will be considered as tampering of the tender process and will invite actionby BHEL as per extant guidelines in vogue.

3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

6. Bidders have to fax the Compliance form before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.

8. Reverse auction will be conducted on scheduled date & time.

9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, as provided on case-to-case basis to Service provider within two working days of Auction without fail.

11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL"s standard practice.

12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the

„Business Rules of Reverse Auction", which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.

15. In case BHEL decides to go for reverse auction, the H1(s) bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

ANNEXURE – 4

Authorization of representative who will participate in the on line Reverse Auction Process;

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

Rev 01
1st June
2012

TECHNICAL CONDITIONS OF CONTRACT (TCC)

(Document No PS:MSX:TCC)

BHARAT HEAVY ELECTRICALS LIMITED

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Contents

PROJECT INFORMATION

1.1 INTRODUCTION

Nuclear Power Corporation of India (NPCIL) intends to set up two (2) nos. of 700 MWe PHWR type Nuclear Power Plants (RAPP-7 and 8) at Rawatbhata near kota, Rajasthan, India. The Rawatbhata site is situated on the bank of the Dam Maharana Pratap Sagar in Rawatbhata of Chittorgarh District of Rajasthan state. The site is accessible by road from Kota is about 70 km from NH-12. Nearest railway station, Kota, is about 70 km from Site. The nearest airport is at Jaipur which is about 250 km from site by road.

SITE INFORMATION

Name of the Owner	:	Nuclear Power Corporation of India Limited (NPCIL)
Address	:	Rajasthan Atomic Power Project – 7 & 8 , Plant Site, P. O. Anushakti, Via: Kota, Rajasthan – 323303 .
New Installation	:	2 x 700 MWe
Nearest Railway station	:	Kota Railway Station (Western Railway) - 70 Km
Nearest Road	:	13 Km from Town of Rawatbhatta
Nearest City	:	Kota
Nearest Airport	:	Jaipur Airport (Approx 250 Km from Rawatbhata),
Highest Temperature	:	48.7 deg C
Lowest Temperature	:	6.7 deg C
Elevation	:	354.77 metres from MSL

Note: - The bidder is advised to visit and examine the site of WORKS and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into the CONTRACT. All costs for and associated with site visits shall be borne by the bidder.

2.0 GENERAL SCOPE OF WORK

2.1 The tender specification covers the construction of all works for **"construction and development of BHEL closed storage sheds with office- 01 no. (900 sqmt) & 01 no. Closed shed without office (720 sqmt.) for 2 x 700 MW Rawatbhata Atomic Power Plant at Kota, District Kota, RAJASTHAN, INDIA"**. Work under this tender includes **supply of all materials**, labour, consumables, transportation, sample testing such as cement, TMT, Structural Steel, Permanently colour coated Galvalume /GI Sheets and false ceiling, steel / wooden door, brick work, aggregates etc.

2.2 The scope of work shall generally include but not limited to the following. The contract will be executed as per BOQ cum Rate Schedule.

- Earth work including excavation, filling, compaction, leveling and grading.
- Plain & Reinforced cement concrete and Masonry (Full and half brick work).
- Structural & reinforcement steel work, AC/GS sheet roofing/side cladding & partition work
- Scaffolding & Formwork
- Finishing work including plastering, doors/windows, flooring, false ceiling, painting etc.
- Water supply and Sanitary work.
- Electrification of Building by providing Incoming cable, Main Distribution Board, Wiring for all installation Light fixtures, power sockets, Exhaust fans, Energy meter Etc.
- Drainage(open and covered)
- MS gates for Entrance/Exit
- Barbed Wire fencing, WBM etc.
- Road work, Culverts, Security Cabins, etc.

2.3 The contract will be executed as per BOQ cum Rate Schedule. If any work covered in the scope of contract cannot be executed using items available in BOQ, additional / extra items shall be made and rates for such items shall be worked out as per GCC clause 2.15.7. However contractor shall be bound to execute all the works under the scope of the contract and decision whether an extra item is applicable or not, shall be taken by BHEL Engineer which will be binding on the contractor.

2.4 Wherever description of items in BOQ cum Rate schedule is found incomplete, CPWD specifications shall be followed.

2.5 BRIEF DESCRIPTION FOR BHEL CLOSED STORAGE SHEDS

There is a rocky stratum at project site, therefor blasting shall have to be carried out for excavation (wherever required) as per "TECHNICAL SPECIFICATIONS FOR BLASTING WORK".

2.6 Reference for Execution of work:

1. IS Code : 4081
2. Explosive Act 1884
3. Explosive Rule 2008
4. Technical Specifications for Blasting Work
5. Atomic Energy Regulatory Board **-** Safety guide for works contract

A. CLOSED STORAGE SHEDS:

Civil Works

The closed storage sheds shall be developed on land given by BHEL having the built up area of Approx. 900 Sq.M & 720 Sq.M.

Closed Shed (60M X 15M) - 1 no.

Closed Shed (48M X 15M) - 1 no.

1 No. Closed Storage Shed shall be provided with Store Office, C&I Store, Common Room, Pantry and Toilet Block etc., 1 Nos. Closed Storage Shed shall be only for storage purpose with side racks as specified in drawings / as instructed by BHEL Engineer.

The Store area shall be cleared of all vegetation, scrap and debris. The stores shall be made of RCC (1:2:4) Columns of size 400mmX400mm with reinforcement as per the drawings up-to a height of 5M above F.F.L., tubular truss, tubular purlins, side ties, bottom ties, wind ties of minimum 25mm x 5mm over the roof sheets along the purlins, as specified (drawings attached for reference). **The working/shop drawings for Steel structures, trusses, etc. shall be got approved from BHEL before start of work**.

The columns foundation shall consist of the bottom most layer of Murrum filling 150 mm thick in plan size of 2mX2m properly watered and compacted, over that a 100 mm thick PCC (1:4:8) layer in 1.7mX1.7m plan area, above PCC shall be casted the Column Footing with RCC (1:2:4) 250 mm thick with the reinforcement of 12 mm dia 150

mm c/c both way. Above the Column Footing shall start the Column with RCC (1:2:4) & with the reinforcement of 4- 16 mm dia main bars and stirrups of 8 mm dia 150 mm c/c spacing as specified in the drawings. The Column shall start from 1.0 m below the existing ground level. RCC (1:2:4) Plinth Beam of 400 mm X 500 mm shall be provided with the reinforcement of Top bars 2- 20 mm dia., bottom bars 4- 16 mm dia. and stirrups 8 mm dia. @ 200 c/c spacing. The top of the Plinth Beam shall be at least 350 mm above the existing ground level. The Column Height above the FFL shall be 5 m (minimum). 2 Nos. of Tie Beams at a height of 2.5 m and 5 m respectively from the FFL shall be provided. Tie Beams shall be of cross-section size 230X300 Sq. mm. with RCC (1:2:4), reinforcement of 5 Nos. 12 mm dia bars and stirrups of 8mm dia @ 200 mm c/c distance shall be provided as per drawings.

Permanently colour coated profiled Galvalume / Permanently Colour Coated Profiles GS / GI sheets shall be provided with polymer coated self-drilling screws for roofing and side cladding with appropriate anchoring, fixing and drainage arrangements. Approved quality Enamel paint shall be used for painting work to MS. The wall above finished floor level is of brick masonry of 230 mm width course, to a height of 5000 mm minimum, in cement mortar 1:6 and plastered with CM 1:6. Below the Finished floor level brick masonry of 230 mm width course, to a depth of 300 mm minimum, in cement mortar 1:6 is to be laid which shall rest on top of 400X500 mm plinth beam. The base course under plinth beam shall be PCC 100 mm thick and 500 mm wide. The finished floor level of the stores shall be at least 390 mm above existing ground level / adjacent road level. The Store flooring consists of raising the Ground level by filling good earth and stone soling of 250 mm thickness and 100 mm PCC over which approved IPS flooring is to be laid. Extended roofing shall also be provided as per the instructions of the BHEL Engineer. Rolling shutters (5mX5m) complete with all guides, rollers, anchors, etc. shall be provided as per BOQ. The inside and outside plastered surface is to be white washed and colour washed respectively with two coats minimum over a priming coat. Contractor to note that no fixtures, specials or any material will be given by BHEL for any works which are required for the completion of works. Average 275 mm deep and 250 mm wide drains shall be constructed along the plinth protection as per directions of the BHEL Engineer.

One no. of Septic tank and Soak Pit shall also be constructed along with the Closed Store with C&I Store and Store Office. Water tank (1000 Litre.) with the Structure along with providing and fixing G.I. piping for Incoming and Outgoing Water as per BOQ, standard codes & practices and as directed by BHEL Engineer is also in the scope of contractor.

100 mm thick, 1.0 metres wide RCC racks / slabs all along one store wall shall be provided at 1.0 metre & 1.8 metre heights from FFL. The slabs shall be rested on brick masonry every 1.2 metre span of size 2.0 metres high. The brickwork shall be plastered to finish and whitewashed as per drawings and BOQ.

RCC Ramp to be provided at the entrance of each shed. HDPE rain water down pipe shall be provided with suitable gutters all around.

B. **IT IS PROPOSED TO ELECTRIFY THE CLOSED SHED AS FOLLOWS:**

Adequate Nos. of Aluminium dispersive Luminaries shall be provided in closed shed with accessories and mounting arrangements as specified in BOQ according to standard codes and practices using best quality materials. Each storage shed shall be provided with the suitable nos. of Ordinary Tube Lights, fans, Exhaust Fans, 5A/ 15A sockets, 3 phase power sockets and switches, power sockets, MCBs, MCCBs, ELCBs, complete with cabling in PVC conduits, Earthing etc. as per the BOQ and as directed by BHEL Engineer for fulfilling functional requirements.

Supplying, Installation and commissioning of common main panel to cater requirement of all total layout, laying incoming cable for the above panel from the outside nearest source, providing feeder panel, lights & sockets requirement etc., laying interconnecting panel between common main panel and feeder main panel, providing MCB distribution board to cater lights, sockets & fans requirement, providing earth electrode and earth conductors complete as per requirement.

Panels are Floor mounted & of 2 mm (min.) thick sheet, outdoor type (IP 55), powder coated having major components from L&T / GE / SIEMENS. Bus bar shall be of copper, current density 1 Amp. /mm^2.

The scope of work has to be completed in all manners to meet the functional requirement by covering all the left out allied work in BOQ thereby to commission the system as a whole.

Complete Electrification along with necessary lighting-fixtures, fans, necessary cables, MCB, ELCB, Main switch, Energy meter, Junction box, switches, switch boards, Plug points etc. are in the contractor's scope so that installation is fully safe & meets local authorities statutory requirement. The necessary covers required for the MCB, energy meter etc., are to be provided by the contractor. Necessary earthing along with earth pit required as per the standards is to be provided by the contractor.

All the material used to be approved by BHEL Engineer. In case of non-availability of approved make of material (as specified in clause 2.5 E of TCC and BOQ).

C. FENCING:

Barbed wire fencing work: Pits of size 300x300 mm^2 and 450 mm deep shall be excavated for MS angle posts at 3 metres. c/c. At least 2 m high **GI barbed wire** fencing with 2.35 m angle iron 50 x 50x 6 mm posts placed every 3 m c/c embedded in cement concrete block (1:3:6), every 15th post but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 10 horizontal lines and two diagonals inter woven with horizontal / diagonal wires of barbed wire, weighing 9.38 Kg per 100 m (min) (12.5 gauge, 2 strands) between the two posts and fixed with GI staples , turn buckles etc. complete shall be provided by the contractor.

D. APPROVED MAKE OF MATERIALS:

1.	STRUCTURAL/REINF. STEEL	:	SAIL / TATA / JINDAL
2.	CEMENT	:	ACC / BIRLA / JAYPEE
3.	ENAMEL PAINTS	:	JOHNSON & NICHOLSON / BERGER / ICI / ASIAN PAINT / NEROLAC
4.	GI & MS PIPES	:	SURYA / PRAKASH / JINDAL-HISSAR / TATA
5.	ELECTRICAL ACCESSORIES		
	a) SWITCHES AND SOCKETS	:	ANCHOR / MK / LK (MODULAR TYPE SWITCHES)
6.	ELECTRICAL EQUIPMENT:		
	a) EXHAUST FANS	:	ALSTOM / CROMPTON/ GC/ NUTECH
	b) LIGHT FITTINGS	:	CROMPTON/PHILIPS /WIPRO
	c) WALL MOUNTING FANS	:	ORIENT/ CROMPTON/ GC/USHA
	d) CFL & FL LAMPS	:	PHILIPS/ OSRAM / WIPRO / BAJAJ
	e) KWH METERS ETC	:	BHEL/ GE/ L&T / HAVELS
	f) MCBs & MCB DBs (10 KA)	:	MDS/ L&T-HAGGER/ RAJ.L/ HAVELS
	g) EARTH LEAKAGE CIRCUIT:		MDS/ L&T-HAGGER/ RAJ.L
	h) BREAKER:		HAVELS EURO

Note.:- Approval of BHEL Engineer is to be obtained before procurement of materials specified above. The make of material mentioned if not available in the market or is not suiting the site conditions or the make of material is not mentioned in the above list, equivalent make may be used after the approval from BHEL engineer.

2.7 The scope of work will also include such other related works although they may not be specifically mentioned in the above paragraph and all such incidental items not specified

but reasonably implied and necessary for completion of the job as a whole all as desired and as directed by the BHEL Engineer.

The detail scope of work covered above is not a comprehensive list of items of work involved. The detail scope of work may vary considerably depending on the actual construction requirements.

2.8 The work under this contract shall be carried out as per BOQ Cum Rate Schedule. In case the description / specifications as per BOQ are found to be incomplete CPWD / IS Code specifications shall be followed. Quantities mentioned in the rate schedules are approximate only and liable for variation due to change of scope of work / variation in schedule of quantities, changes in design etc. The tenderers shall undertake to execute actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same. The quantities indicated against each item may vary to any extent and no compensation will be payable in variation of Individual quantity.

2.9 ALSO INCLUDED IN THE SCOPE

Unless otherwise specified, the work to be provided by the contractor for the items mentioned in the "Bill of Quantities" shall include but not be limited to the following.

a) Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport, to and from the site, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown or specified but reasonably implied or necessary for the proper completion, maintenance and handing over the works, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provide by the BHEL engineer during the course of works.

b) Furnishing samples of all materials required by the BHEL Engineer for testing / inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.

c) Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the BHEL Engineer.

d) Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, those are required for all works including temporary works.
e) Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
f) Carrying out topographic survey of the work area and establish levels and coordinates at suitable intervals from existing grid levels and coordinates furnished by the owner established bench marks, setting out the locations and levels of proposed structures, constructions and marking of reference pillars and other identification works etc., The contractor shall provide the owner/BHEL such a assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.
g) Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.
h) Police verification is required for all Employee, Supervisor and labour.
i) Labour licence is required for all the labour.
j) One identity Card is required ie. Voter Card , Aadhar Card or any Government issued Identity Card for all employee of bidder.

2.10 STORAGE OF EXPLOSIVES

Storage of Explosives shall be carried out as per IS Code 4081

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.1.0	***ESTABLISHMENT***			
1.1.1	***FOR CONSTRUCTION PURPOSE:***			
A	***OPEN SPACE FOR STORAGE***	Yes		
B	***CONSTRUCTION OF BIDDER'S OFFICE, CANTEEN AND STORAGE BUILDING INCLUDING SUPPLY OF MATERIALS AND OTHER SERVICES***		Yes	
C	***BIDDER'S ALL OFFICE EQUIPMENT, OFFICE / STORE / CANTEEN CONSUMABLES***		Yes	
D	***CANTEEN FACILITIES FOR THE BIDDER'S STAFF, SUPERVISORS AND ENGINEERS ETC.***		Yes	
E	***FIRE FIGHTING EQUIPMENT LIKE BUCKETS, EXTINGUISHERS ETC.***		Yes	
F	***FENCING OF STORAGE AREA, OFFICE, CANTEEN ETC. OF THE BIDDER***		Yes	
1.1.2	*FOR LIVING PURPOSES OF THE BIDDER*			
A	***OPEN SPACE***		Yes	
B	***LIVING ACCOMMODATION***		Yes	
1.2.0	***ELECTRICITY***			
1.2.1	***ELECTRICITY FOR CONSTRUCTION PURPOSES***		**Yes**	Contractor shall have to deploy the DG sets for carrying out the tender

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.2.1.1	***SINGLE POINT SOURCE***			works. However electricity shall be provided on chargeable basis at customer's single point source subject to availability.
1.2.1.2	***FURTHER DISTRIBUTION FOR THE WORK TO BE DONE WHICH INCLUDE SUPPLY OF MATERIALS AND EXECUTION***		Yes	
1.2.2	***ELECTRICITY FOR THE OFFICE, STORES, CANTEEN ETC. OF THE BIDDER WHICH INCLUDE:***		Yes	
1.2.2.1	***DISTRIBUTION FROM SINGLE POINT INCLUDING SUPPLY OF MATERIALS AND SERVICE***		Yes	
1.2.2.2	***SUPPLY, INSTALLATION AND CONNECTION OF MATERIAL OF ENERGY METER INCLUDING OPERATION AND MAINTENANCE***		Yes	
1.2.2.3	***DUTIES AND DEPOSITS INCLUDING STATUTORY CLEARANCES FOR THE ABOVE***		Yes	
1.2.2.4	***LIVING FACILITIES FOR OFFICE USE INCLUDING CHARGES***		Yes	
1.2.2.5	***DEMOBILIZATION OF THE FACILITIES AFTER COMPLETION OF WORKS***		Yes	
1.2.3	***ELECTRICITY FOR LIVING ACCOMMODATION OF THE BIDDER'S STAFF, ENGINEERS, SUPERVISORS ETC ON THE ABOVE LINES.***		Yes	
1.3.0	***WATER SUPPLY***			

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.3.1	***FOR CONSTRUCTION PURPOSES:***			
1.3.1.1	***MAKING THE WATER AVAILABLE AT SINGLE POINT***		**Yes**	Bidder has to arrange for construction water at his own arrangement by restoring to the methods like Water Container, water tankers etc.
1.3.1.2	***FURTHER DISTRIBUTION AS PER THE REQUIREMENT OF WORK INCLUDING SUPPLY OF MATERIALS AND EXECUTION***		Yes	
1.3.2	***WATER SUPPLY FOR BIDDER'S OFFICE, STORES, CANTEEN ETC.***		Yes	
1.3.2.1	***MAKING THE WATER AVAILABLE AT SINGLE POINT***		**Yes**	Bidder has to arrange for safe drinking water for staff and labour at his own cost.
1.3.2.2	***FURTHER DISTRIBUTION AS PER THE REQUIREMENT OF WORK INCLUDING SUPPLY OF MATERIALS AND EXECUTION***		Yes	
1.4.0	***LIGHTING***			
1.4.1	***FOR CONSTRUCTION WORK (SUPPLY OF ALL THE NECESSARY MATERIALS)*** 1. At office storage area 2. At the preassembly area 3. At the construction site /area		Yes	

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.4.2	***FOR CONSTRUCTION WORK (EXECUTION OF THE LIGHTING WORK/ ARRANGEMENTS)*** 1. At office storage area 2. At the preassembly area 3. At the construction site /area		Yes	
1.4.3	***PROVIDING THE NECESSARY CONSUMABLES LIKE BULBS, SWITCHES, ETC. DURING THE COURSE OF CONSTRUCTION***		Yes	
1.4.4	***LIGHTING FOR THE LIVING PURPOSES OF THE BIDDER AT THE COLONY / QUARTERS***		Yes	
1.5.0	***COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER***			
1.5.1	***TELEPHONE, FAX, INTERNET, INTRANET, E-MAIL ETC.***		Yes	
1.6.0	***COMPRESSED AIR SUPPLY***			
1.6.1	***SUPPLY OF COMPRESSOR AND ALL OTHER EQUIPMENT REQUIRED FOR COMPRESSOR AND COMPRESSED AIR SYSTEM INCLUDING PIPES, VALVES, STORAGE SYSTEMS ETC.***		Yes	
1.6.2	***INSTALLATION OF THE ABOVE SYSTEM AND OPERATION AND MAINTENANCE OF THE SAME.***		Yes	
1.6.3	***SUPPLY OF THE ALL THE CONSUMABLES FOR THE ABOVE SYSTEM DURING THE CONTRACT PERIOD.***		Yes	

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.0	***CONSTRUCTION FACILITIES***			
2.1.0	***ENGINEERING WORKS FOR CONSTRUCTION:***			
2.1.1	***PROVIDING THE CONSTRUCTION DRAWINGS FOR ALL THE STRUCTURES COVERED UNDER THIS SCOPE***	Yes		
2.1.2	***DRAWINGS FOR CONSTRUCTION METHODS***		Yes	Fabrication Drawings.
2.1.3	***AS-BUILT DRAWINGS – WHERE EVER DEVIATIONS OBSERVED AND EXECUTED AND ALSO BASED ON THE DECISIONS TAKEN AT SITE– ROUTING OF SMALL BORE PIPES***			NA
2.1.4	***SHIPPING LISTS ETC. FOR REFERENCE AND PLANNING THE ACTIVITIES***			NA
2.1.5	***PREPARATION OF SITE CONSTRUCTION SCHEDULES AND OTHER INPUT REQUIREMENTS***		Yes	
2.1.6	***REVIEW OF PERFORMANCE AND REVISION OF SITE CONSTRUCTION SCHEDULES IN ORDER TO ACHIEVE THE END DATES AND OTHER COMMITMENTS***	**Yes**	Yes	
2.1.7	***WEEKLY CONSTRUCTION SCHEDULES BASED ON SL. NO 2.1.5***		Yes	
2.1.8	***DAILY CONSTRUCTION / WORK PLAN BASED ON SL. NO 2.1.7***		Yes	

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.1.9	***PERIODIC VISIT OF THE SENIOR OFFICIAL OF THE BIDDER TO SITE, REVIEW THE PROGRESS SO THAT WORKS ARE COMPLETED AS PER SCHEDULE. IT IS SUGGESTED THIS REVIEW BY THE SENIOR OFFICIAL OF THE BIDDER SHOULD BE DONE ONCE IN EVERY TWO MONTHS.***		Yes	
2.1.10	***PREPARATION OF PREASSEMBLY BAY***		Yes	
2.1.11	***LAYING OF RACKS FOR GANTRY CRANE IF PROVIDED BY BHEL OR BROUGHT BY THE CONTRACTOR/BIDDER HIMSELF***			NA

LIST OF TOOL & PLANTS TO BE DEPLOYED BY THE CONTRACTOR -

T & P TO BE ARRANGED BY THE CONTRACTOR AT HIS OWN COST

Sl. No.	EQUIPMENT
1	CONCRETE MIXER M/C OF SUITABLE CAPACITY
2	CONCRETE VIBRATORS
3	JCB/ Excavator/ Dozer/ Jack Hammers with compressor.
4	Trucks/lorries/Tractors/Dumpers
5	WATER TANKER
6	DEWATERING PUMP
7	WINCHES
8	WELDING MACHINES
9	ROAD ROLLERS

NOTES:

1. The above list is only indicative and these T&Ps may not be required for entire contract period and will be provided as per project need. Contractor will assess actual quantity and period of requirement based on his experience.
2. For Other terms and conditions regarding above items please also refer clause for T&P/IMTEs in GCC & SCC.
3. All the tools and plants required for this scope of work, except the Tools & Plants provided by BHEL are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. Any additional T & P required to be arranged by the contractor.

4. If work gets delayed due to non-availability of T&P, BHEL reserves the right to get the work done at the risk and cost of contractor without prejudice to rights of BHEL as in GCC.

B: INSPECTION, MEASURING AND TESTING EQUIPMENTS (IMTE's):

INDICATIVE LIST OF IMTEs TO BE ARRANGED BY THE CONTRACTOR AT HIS OWN COST

SL NO	EQUIPMENT
1	TOTAL STATION
2	AUTO LEVEL
3	MEASURING TAPE
4	PLUMB BOBS

NOTES:

1. The above list is only indicative and these IMTEs may not be required for entire contract period and will be provided as per need. Contractor will assess actual quantity and period of requirement based on his experience
2. Other terms and conditions regarding above items please also refer clause for T&P/IMTEs.
3. All the IMTEs /MMEs required for this scope of work, except the IMTEs / MMEs provided by BHEL, are to be arranged by the contractor within the quoted rates. **The list is suggestive in nature. Any additional IMTEs / MMEs required to be arranged by the contractor.**

TIME SCHEDULE

5.1 INITIAL MOBILIZATION

After receipt of fax LOI, Contractor shall discuss with Project Manager / Construction Manager regarding initial mobilization. Contractor shall mobilize necessary resources within 2 weeks of issue of fax letter of intent or as per the directive of Project Manager / Construction Manager. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

The scheduled date of start of work shall be the date after 2 weeks of issue of LOI; however the actual date of start of contract period shall be date of handing over of site to contractor for work and shall be certified by the BHEL Engineer.

"In case BHEL/Customer is not able to give the front for start of work within 6 months from the date of issue of L.O.I. The Contractor has the option to withdraw without any implication on either side".

5.2 Entire work as detailed in tender specification **shall be completed within 4 months from the scheduled date of start of work.** Contractor has to mobilize adequate resources to meet BHEL's commitments to their customer as indicated from time to time.

Time of Completion of Major Mile stones shall be as under.

5.3 Detailed Work completion Schedule will be submitted for approval by the successful bidder within 2 weeks of issue of LOI.

5.4 In case due to reasons not attributable to the contractor, the work gets delayed and scheduled completion gets extended, time extension will be accordingly granted by BHEL.

5.5 The work under the scope of this contract is deemed to be completed in all respects, only when all the works are carried out as per satisfaction of BHEL. The decision of BHEL on completion date shall be final and binding on the contractor.

In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

5.6 CONTRACT PERIOD

The contract period for completion of entire work under scope from the "**START OF CONTRACT PERIOD**" as specified earlier shall be as follows:

COMPLETE WORKS : 4 MONTHS

With indicative milestones as below:

Closed Shed with office	:	Within 4 months from Scheduled date of start
Closed Shed without office	:	Within 3 months from Scheduled date of start

5.7 CONSEQUENCE OF DELAY

In case of delay in completion is attributable to the contractor, BHEL may impose LD on the contractor as per GCC.

6.0 TERMS OF PAYMENT

As per Chapter - X of SCC.

7.0 **TAXES & DUTIES**

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

However, provisions regarding **Service Tax** and **Value Added Tax (VAT)** on output services and goods shall be as per following clauses.

7.1 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **inclusive** of Service Tax and Cess on Output Services.

Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. The Service Tax Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract.

For the purpose of claiming any Service Tax from BHEL, the following procedure shall be adopted:

Contractor shall submit serially numbered Service Tax and Cess Invoices, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely:

The name, address and registration number of the contractor

The name and address of the party receiving taxable service (BHEL)

Description, classification and value of taxable service provided and

The Service Tax payable thereon.

All the four conditions shall be fulfilled in the invoice for payment of Service Tax by BHEL. Where more than one nature of Service under Service Tax Rules is involved, the invoice mentioned above shall contain the breakup of all values for each nature of Service.

Name and address of the contractor should be same in the service tax invoice and monthly bill. Any change in the name and address in past should be supported by documentary evidence duly certified by the registering authority.

Purpose of above requirements, inter alia, is to enable availment of CENVAT credit by BHEL. As per recent amendment time restrictions for taking cenvat credit is within Six months from date of invoice. Wherever CENVAT credit could not be availed by BHEL within statutory time limit of 6 months due to delay in submission of invoice or for any other reason attributable to contractors, liability towards loss of such CENVAT credit shall be passed on to contractors.

7.2 VAT (Sales Tax /WCT)

Civil Works:

As regards Value Added Tax (VAT) on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be **inclusive** of the same. Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. In case contractor opts for composition, it will be with the prior express consent of BHEL. The VAT Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. BHEL also reserves the right to demand "Tax Invoice" under the relevant VAT Act, from the Contractor. Where such taxes are required to be paid by the contractor subject to the above, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only.

Works other than Civil Works:

The rates quoted by the Contractor shall be inclusive of VAT/Sales Tax and BHEL shall not reimburse any amount on this account due to any reason whatsoever.

Common to all Works (Both Civil and Other than Civil)

The Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill.

Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax/VAT Authorities, for bringing all their material, plant and equipment etc at site for the execution of the work, including arrangement of Road Permits if and as applicable under the relevant VAT Act.

7.2.1 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

8.0 MATERIALS

8.1 The contractor shall, at his own expenses (Inclusive of Taxes), provide all materials required for the work.

8.2 All stores and materials to be provided by the Contractor shall be of the best kind in conformity with the specifications laid down in the contract or as per relevant Indian standard and the Contractor shall, if requested by the BHEL Engineer, furnish proof to the satisfaction of BHEL Engineer that the materials so comply.

8.3 The Contractor shall, at his own expense and without delay, supply to the BHEL Engineer samples of materials proposed to be used in the works. The BHEL Engineer shall within seven days of supply of samples or within such further period as he may require will 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 BHEL Engineer for his approval fresh samples complying with the specifications laid down in the Contract. Any delay in approval of samples (original or fresh ones) shall not make the contractor eligible for any compensation.

8.4 The BHEL Engineer shall have full powers for removal of any or all of the materials brought to 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 BHEL Engineer shall be at liberty to have them removed by other means. The BHEL Engineer shall have full powers to procure other proper material 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 means. All costs, which may attend upon such removal and / or substitution, shall be borne by the Contractor.

8.5 The Contractor shall indemnify BHEL, its representatives or employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the Contract. In the event of any claim being made or action being brought against BHEL or any agent, servant

or employee of BHEL in respect of any such matters as aforesaid, the Contractor shall immediately be notified thereof, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by BHEL but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the Contractor only if the use was the result of any drawings / specifications issued after submission of the tender.

8.6 The BHEL Engineer shall be entitled to have tests carried out as specified in the Contract for any materials supplied by the Contractor other than those for which, as stated above, 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 may require for the purpose. If no tests are specified in the Contract, and such tests are required by the Engineer, the Contractor shall provide all facilities required for the purpose and the charges for these tests shall be borne by the Contractor only. The cost of materials consumed in tests shall be borne by the Contractor in all cases except when otherwise provided.

8.7 In addition, the Contractor shall perform / submit at his own cost such tests / samples as may be required by the BHEL Engineer out of the materials used by the company except for the costs of materials used in such tests/ samples.

8.8 After acceptance of the Contract, if Contractor desires BHEL to supply any other materials, such material may be supplied by BHEL, if available, at rates to be fixed by the BHEL Engineer along with prevailing departmental charges (current rate of 30%). BHEL reserve the right not to issue any material. The non-issue of such material will not entitle the Contractor for any compensation whatsoever either in time or in cost.

8.9 Material required for the works, whether brought by the Contractor or supplied by BHEL, shall be stored by the Contractor only at places approved by the Engineer. Storage and safe custody of material shall be the responsibility of the contractor.

8.10 BHEL's officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used 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 at 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.

8.11 All materials brought to the Site shall become and remains the property of BHEL and shall not be removed off the Site without the prior written approval of the BHEL Engineer. But whenever the Works are finally completed and advance, if any, in respect of any such material is fully recovered, the Contractor shall at his own expense forthwith remove from the Site all surplus material originally supplied by him and upon such removal, the same shall re-vest in and become the property of the Contractor.

9.0 EXECUTION OF WORK

9.1 The work shall be executed in a workman like manner and to the entire satisfaction of the Engineer and as per technical specification issued with tender, IS codes, CPWD specifications as applicable. In case of conflict, the decision of the **BHEL** Engineer shall be final & binding.

9.2 The BHEL Engineer will communicate or confirm his instructions to the Contractor in respect of the execution of the work in a "Work Site Order Book" maintained at his office and the Contractor shall visit this office daily and shall confirm receipt of such instructions by signing the relevant entries in this book. Such entries will rank as order or notices in writing within the intent and meaning of these conditions.

10.0 SETTING OUT

10.1 All the works shall be set out to the true lines, grades and elevation indicated on the drawing. The contractor shall be responsible to locate and set out the works. Only one grid reference line and bench mark shall be made available for setting out the works under the contract. This reference lines shall be used as datum for the works under the contract and the contractor has to establish for his work area at available points horizontal and vertical control points. The contractor shall inform BHEL well in advance of the times & places at which he wishes to do work in the area allotted to him so that suitable datum points established by him are checked by BHEL / Customer to enable the contractor to proceed with the works. Any work done without being properly located may be removed and / or dismantled by BHEL / Customer at contractor's expenses.

10.2 The contractor shall at his own expense take all proper and responsible precautions to preserve and maintain these datum marks to its true position In the event of these marks being disturbed or obliterated by accident or due to any other cause whatsoever, the same may be deemed necessary placed by BHEL / Customer at contractor's expenses.

11.0 SITE DRAINAGE

11.1 All water including sub-soil water which may accumulate on the Site during the progress of the works or in trenches and excavations, including monsoon period shall be removed by the contractor from the Site to the satisfaction of the BHEL Engineer. It will also be responsibility of the contractor to de-water all the foundation pits, trenches with suitable de-watering methods like, pumping out, well point system etc. Considering the depth of water table at plant site. All such expenditure on de-watering shall be deemed to be included in quoted rates.

12.0 INSPECTION AND STAGE APPROVAL OF THE WORK

12.1 All work embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice in writing to the BHEL Engineer when each stage is ready. In default of such notice being received, the BHEL Engineer shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the BHEL Engineer thereon shall be final and conclusive.

13.0 UNCOVERING AND MAKING GOOD

13.1 The Contractor shall uncover any part of the Works and/or make openings in or through the same as the Engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the BHEL Engineer. If any such part has been covered up or put out of view after being approved by the Engineer and is subsequently found on uncovering to be executed in accordance with the Contract, the expenses of uncovering and / or making opening in or through, reinstating and making good the same shall be borne by BHEL. In any other case all such expenses shall be borne by the Contractor.

13.2 If neither drawing nor specification contain any mention of minor details of construction which in the opinion of the BHEL Engineer whose decision shall be final and conclusive, are reasonable and obviously and fairly intended for satisfactory completion of work, such details shall be provided by the contractor without any extra cost, as if they were specially mentioned and shall be deemed to be included in the scope**.**

14.0 NUISANCE

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

15.0 MATERIAL OBTAINED FROM EXCAVATION

15.1 Materials of any kind obtained from excavation on the Site shall remain the property of BHEL / its client and shall be disposed of as the BHEL Engineer may direct, at no extra cost.

16.0 TREASURE, TROVE, FOSSILS etc.

16.1 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 BHEL / BHEL's client and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing, shall immediately upon discovery thereof and before removal acquaint the BHEL Engineer with such discovery and carryout the Engineer's directions as to the disposal of the same.

17.0 PROTECTION OF WORKS

17.1 Trees designated by the Engineer shall be protected from damage during the course of the Works and earth level within 1 meter of each such tree shall not be charged. Where necessary, such trees shall be protected by providing temporary fencing.

17.2 The contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the BHEL Engineer for the

protection of the Works or for the safety and convenience of those employed on the Works or the public.

17.3 The contractor shall have total responsibility for protecting his works till it is finally taken over by the BHEL. No claim will be entertained by the BHEL Engineer for any damage or loss to the contractor's works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with the party concerned. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.

18.0 PROTECTION OF EMBEDMENTS BOLTS ETC.

18.1 The contractor shall ensure proper protection to the satisfaction of the BHEL Engineer, of all bolts, inserts, embedment etc. from weather etc. by greasing, rapping them with gunny bags or canvas or by any other means as directed by BHEL Engineer. Cost of such protections shall be deemed to be included in the rates quoted for the item.

19.0 CLEARANCE OF SITE AND REPAIRS.

19.1 Contractor has to clear the site / area where mechanical and electrical erection work is to be commenced / or in progress. The contractor shall remove construction materials and equipment lying in the vicinity and causing obstruction in the erection work within 24 hrs. Notice, In case he fails to clear the site, this will be done at his risk & cost by BHEL.

20.0 QUALITY ASSURANCE

20.1 The contractor has to establish / arrange at site the field testing facilities for testing of civil construction materials and concrete cubes for ensuring the proper quality, grade and strength of the materials used in the construction in line with approved field quality check list of BHEL/ its client. Contractor has to submit detailed report for testing of all material used etc. All testing shall be done as per IS code specifications/ BHEL's quality plan. If further test is required

by the engineer to be carried from outside laboratory, the cost of the same shall be borne by the contractor.

21.0 COMPLETION OF WORK

21.1 The works shall be completed to the entire satisfaction of the BHEL Engineer and in accordance with the completion schedule as specified in the Contract, and all unused stores and materials, tools, plant, equipment, temporary buildings, site office, labour hutments and other things shall be removed and the site and work cleared of rubbish and all waste materials and delivered up clean and tidy to the satisfaction of the BHEL Engineer at the Contractor's expenses.

21.2 BHEL shall have power to take over from the Contractor from time to time such sections of the work as have been completed to the satisfaction of the BHEL Engineer. Such work however shall not be treated as have been completed until the extra works are executed to the satisfaction of BHEL Engineer. The Guarantee period shall commence only after handing over of the entire works.

21.3 The BHEL Engineer shall certify to the contractor the date on which the work is completed and the date thereof.

22.0 METHOD OF MEASUREMENT

22.1 Method of measurements if not specified in the tender, shall be as per relevant IS Codes / CPWD codes.

23.0 HSE: The contractor shall comply with following towards Safety and Social Accountability;

23.1 Besides provision with regard to SAFETY under Clause 27 of GCC, the contractor will be responsible for Health, Safety & Environment management at site for the construction activities to be carried out by them in accordance with requirements **given under section I (a) of GCC of this document**. The contractor shall continuously take special care to ensure the safety and prevention of human and equipment accidents and maintain good sanitary conditions in and around the site. All the construction work and plant operation must be carried out in the safest possible manner. The BHEL Engineer reserves the right to stop any process which, in the E I/C's opinion, is being performed dangerously. In this case the contractor must immediately adhere the requisite safety precautions and any delays attributed to the work stoppage on this account shall not affect the agreed contractual finishing dates.

23.2 The contractor shall appoint dedicated full-time Qualified Safety Officers who shall have full authority to ensure that all necessary safety precautions are observed by the Contractor's employees and sub-contractors. These appointees shall have full responsibility for the safety of all personnel within the contractor's area of the works.

23.3 Some of the common safety rules to be followed during working are as follows**:-**

- Nobody is allowed to enter at construction site without Safety Shoe.
- Never enter work area without Safety helmet & chin strap in place.
- No climbing/working allowed without proper safety belt above 2 m. height.
- Do not exceed the speed limit 25 Kmph within premises.
- No debris obstacles allowed on the roads & passages.
- Do not walk on pipelines or false ceiling.
- Maintain good Housekeeping at work site.
- No photography/ Videography allowed without permission
- All Site supervisors & engineers (including subcontractor's) must be imparted structured training on construction safety before start of the job & record to be maintained.
- Availability of qualified & trained Site Engineer at site during all working hours.
- Site Safety training to be imparted to all workers & plan to be made to cover every worker.
- Tools box talk (5-15 minutes) by supervisor prior to commencement of any job.
- All accident / incidents(Near Miss) to be reported & investigated.(formats & procedure should be finalized)
- Daily Safety Checking by Each Site Engineer along with Safety engineer.
- Weekly co-ordination meeting of all Safety engineers with BHEL safety officer.
- Monthly safety meeting with Site In-charges.
- All Safety equipment must be ISI marked & checked by Safety officer before use.
- Tag system for erection & use of scaffoldings.
- Bamboo/wooden Scaffolding material not allowed.
- LPG cylinders not allowed for gas cutting.
- Good Housekeeping. Separate waste bins to be used for flammable & non-flammable material.
- Safety awareness programs for workers by display of boards, posters, competitions, talks etc.
- Deployment of Safety Supervisors for every 250 workers and part thereof at work site.
- Display of List of First Aid trained persons.
- Testing certificates for lifting tools & tackle.
- Provision & maintenance of fire extinguishers at construction site & material stores.
- Display of emergency telephone numbers at various locations.
- For work in confined space use 24 V lamp fitting & use tools with air motors or electric tools with max. 24 V.
- For confined space entry Gas test must be done before & at regular intervals.
- Checking & tag of equipment like grinding machine, welding machine, gas cutting set etc. by supervisors before use.

23.4 **Contractor shall ensure following:**

1. Contractor has to maintain contact with local hospital having scanning & other ultra-modern medical facilities required during emergency including Ambulance.
2. Contractor has to ensure pre-employment medical check for all staff & workers.
3. Contractor has to ensure that adequate First Aid facilities with trained nurse & ambulance are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following

- Male nurse (in shifts)
- Oxygen set up
- Breathing apparatus
- Eye wash facility
- Stretcher
- Trauma blanket
- Medicines

In addition to above, BHEL may arrange ambulance at work site for emergency purpose, which can be utilized, free of cost, by contractor in case of emergency. In case, under unavoidable circumstances, if the ambulance is not available/ being used elsewhere, the contractor will have to arrange for the same. as under clause 24.4 Sl No. 1.

23.5 The Contractor shall be fully responsible for accidents caused due to him or his agents or workmen's negligence or carelessness in regard to the observance of the safety requirements and shall be liable to pay compensation for injuries. **It may be noted that non-compliance to HSE requirements will result in penal action. In case of violations of safety requirements, the Contractor shall be liable for a penalty of Rs. 500/- for the first violation and Rs. 1000/- for the subsequent violations. For serious lapses, as decided by BHEL Engineer, fines up to Rs. 5000/- at a time can be imposed.**

The amount towards penalties as above will be deducted from running bills of the Contractor. The amount so collected above will be utilized for supporting the safety activities at site. The decision of BHEL on above will be final and binding on the Contractor.

23.6 **The contractor shall comply with following towards Social Accountability;**

(a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged , the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.

(b) The contractor shall not engage Forced/Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.

(c) The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act 1970.

(d) The Contractor shall abide by UN convention w.r.t Human Rights and shall be liable for Discrimation/Corporal punishment for failure in meeting with relevant requirements.

(e) The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.

(f) The Contractor shall abide by the statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.

(g) The Contractor shall arrange potable drinking water to its employees & workers.

24.0 DISCREPANCIES AND ADJUSTMENT OF ERRORS

24.1 The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawings and figures dimensions in preference to scale and special conditions in preference to general conditions.

24.2 In case of discrepancies between schedules of quantities, the specification and / or the drawings, the following order of preference shall be observed.

(a) Description in schedule of quantities.

(b) Technical Conditions of Contract

(c) Drawings

(d) Technical Specifications

(e) Special Conditions of Contract

(f) General conditions of contract

If there are varying or conflicting provisions made in any one document forming part of the contract, the BHEL Engineer shall be the deciding authority with regard to the document.

24.3 Any error in description, quantity in schedule of quantities or any omission therefrom shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to the drawings and specifications or from any of his obligations under the contract.

25.0 Modification/ deletion of GCC & SCC clauses:

I. Clause No. 4.1.4, 4.1.9 & 4.1.10 of SCC (Consumables & Other Items) shall not be applicable.

II. Clause No. 4.2.2 of SCC (Obligations in respect of T&Ps and MMEs provided by BHEL) shall not be applicable.

III. Clause No. 2.12 of GCC (ORC) shall not be applicable.

IV. Clause No. 2.17 of GCC (PVC) shall not be applicable

V. Clause No. 2.13 of GCC (Interest bearing recoverable advance) shall not be applicable.

VI. Clause No. 2.14.1 of GCC modified as: The quoted rates shall remain firm irrespective of any variations in the individual quantities. No compensation becomes payable in case the variation of the final executed contract value is within the limits of Plus (+) or Minus (-) 30% of awarded contract value.

Chapter – X

RATE SCHEDULE		
ITEM NUM	**DESCRIPTION OF WORK**	**Total Value (A)** **In Rupees** **(In figures and words) including service tax**
1.0	**CONSTRUCTION AND DEVELOPMENT OF BHEL CLOSED STORAGE SHED WITH OFFICE- 01 No. (900 SQMT) & CLOSED SHED WITHOUT OFFICE 01 No. (720 SQMT.) FOR CCI PACKAGE AT 2X700 MWe RAPP- KOTA**	

Notes:

1. The rates of individual item for the entire scope of work as defined in BOQ shall be arrived as per Calculation defined in Anex- 'B'
2. The derived item rate will remain firm throughout the contract period.

ANNEXURE-B

BOQ CUM RATE SCHEDULE

SCOPE: CONSTRUCTION AND DEVELOPMENT OF BHEL CLOSED STORAGE SHED WITH OFFICE- 01 No. (900 SQMT) & CLOSED SHED WITHOUT OFFICE 01 No. (720 SQMT.) FOR CCI PACKAGE AT 2X700 MWe RAPP- KOTA .

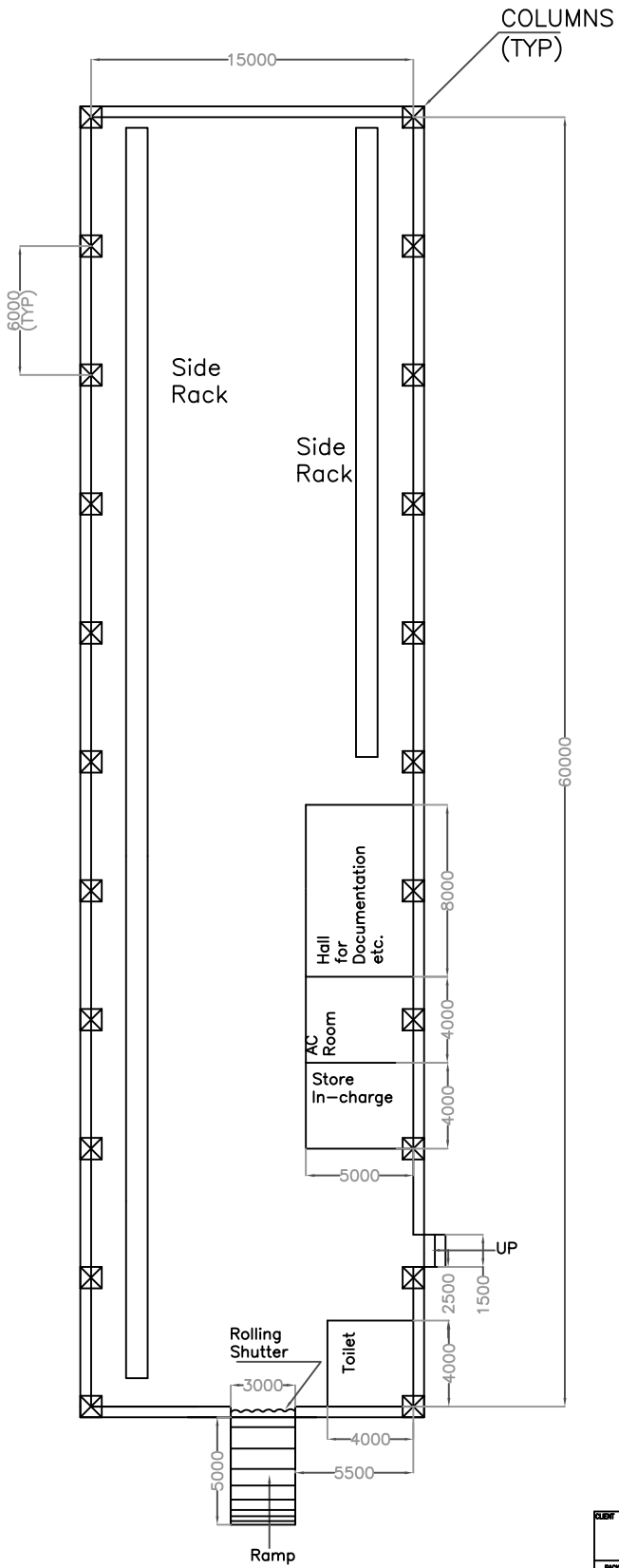
SL.NO	ITEM CODE	DESCRIPTION OF WORK	UNIT	QUANTITY	Factor (F)	Rate (A X F) / 100000	Amount
		(A) CIVIL WORKS					
		EARTH WORK/ SITE CLEARANCE/ ROAD WORK					
1	C1	EARTH WORK IN **EXCAVATION FROM 0 (ZERO) TO 2 M DEPTH** IN ALL KINDS OF SOIL **(EXCEPT SOFT ROCK AND HARD ROCK)** FOR **FOUNDATIONS, SEPTIC TANK, DRAINS, SOAK PIT, RAMPS** ETC., AS DIRECTED BY BHEL ENGINEER INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	114.00	0.98		
2	C2	EARTH WORK IN **EXCAVATION FROM 0 (ZERO) TO 2 M DEPTH FOR SOFT ROCK AND HARD ROCK** (BY MANUAL CHISELING OR BY MECHANICAL MEANS BUT WITHOUT BLASTING) FOR F**OUNDATIONS, SEPTIC TANK, DRAINS, SOAK PIT, RAMPS ETC.**, AS DIRECTED BY BHEL ENGINEER INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	178.00	1.62		
3	B1	EARTH WORK IN **EXCAVATION FROM 0 (ZERO) TO 2 M DEPTH FOR HARD ROCK** (REQUIRING BLASTING) BY MECHANICAL MEANS (HYDRAULIC EXCAVATOR)/ MANUAL MEANS FOR **FOUNDATIONS, SEPTIC TANK, DRAINS, SOAK PIT, RAMPS ETC.**, AS DIRECTED BY BHEL ENGINEER INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	700.00	2.84		
4	C3	EARTH WORK IN **EXCAVATION FROM 2.0M TO 4.0 M DEPTH** IN **ALL KINDS OF SOIL (EXCEPT HARD ROCK AND SOFT ROCK)** FOR **FOUNDATIONS, SEPTIC TANK, RAMPS, SOAK PIT ETC.**, AS DIRECTED BY BHEL ENGINEER INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	4.00	1.33		
5	C4	EXCAVATION IN ALL KINDS OF SOIL **INCLUDING SOFT & HARD ROCK** (BY MANUAL CHISELING OR BY MECHANICAL MEANS BUT WITHOUT BLASTING) **FROM 2 TO 4M DEPTH** FOR **FOUNDATIONS, SEPTIC TANK, RAMPS, SOAK PIT ETC.,** WHEREVER REQUIRED INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	9.00	3.42		
6	B2	EARTH WORK IN **EXCAVATION FROM 2 (ZERO) TO 4 M DEPTH FOR HARD ROCK** (REQUIRING BLASTING) BY MECHANICAL MEANS (HYDRAULIC EXCAVATOR)/ MANUAL MEANS FOR **FOUNDATIONS, SEPTIC TANK, RAMPS, SOAK PIT ETC.,** AS DIRECTED BY BHEL ENGINEER INCLUDING REMOVING THE EXCAVATED MATERIALS UP TO A DISTANCE OF 50M, DEWATERING (BOTH GROUND WATER AS WELL AS RAIN WATER) AND KEEP THE AREA DRY TILL COMPLETION OF ALL THE WORKS, LABOURS, MATERIALS AND REQUIRED T&Ps ETC. COMPLETE.	M3	75.00	3.83		
7	C7	**DEVELOPMENT OF APPROACH ROADS:** SUB GRADE PREPARATION BY CUTTING & DISPOSAL OF GRASS, VEGITATIONS, BUSHES, TREES (GIRTH LESS THAN 300MM), LEVELLING, WATERING AND CONSOLIDATION (90% OF PROCTOR DENSITY) BY MEANS OF 10-12 MT CAPACITY POWER/VIBRO ROLLER FOR SUB BASE PREPARATION. THIS WILL INCLUDE AVERAGE CUTTING & FILLING UP TO ± 250 MM THICK (FOR ALL KIND OF SOILS INCLUDING SOFT ROCK AND HARD ROCK), GRADING THE AREA WITH PROPER SLOPE (CAMBER) FOR DRAINING OUT THE RAIN WATER WITH ALL T&P, LABOURS, MATERIALS, DEWATERING (IF REQUIRED) ETC. COMPLETE. FOR DEVELOPMENT OF APPROACH ROADS FROM NEAREST MAIN PLANT ROAD TO BHEL FACILITIES AS REQUIRED BY BHEL ENGINEER INCLUDING DISPOSAL OF UNUSABLE MATERIAL UPTO THE LEAD OF 1 KM. IF REQUIRED FILLING MATERIAL (VIZ. GOOD EARTH, SAND DUST, MOORUM ETC.) SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING TRANSPORTATION, ROYALITIES, TAXES ETC. AT NO EXTRA COST.	M2	1200.00	0.49		
8	C8	**SUB GRADE PREPARATION:** CUTTING LEVELLING, FILLING WITH EXCAVATED EARTH, WATERING AND CONSOLIDATION FOR **PLINTH PROTECTION AREA AND WHEREVER REQUIRED** BEFORE LAYING THE PCC WITH ALL T&P, LABOURS, MATERIALS ETC. COMPLETE.	M2	213.00	0.49		
9	C10	DISPOSAL OF EXCAVATED EARTH / ROCK **(NOT SUITABLE FOR BACK FILLING)** BEYOND INITIAL LEAD OF 50M AND UPTO A MAXIMUM LEAD OF 2 KM OR PART THEREOF INCLUDING LOADING, UNLOADING , TRANSPORTING AND SPREADING AS PER DIRECTION OF BHEL ENGINEER .	M3	252.00	0.76		
10	C11	BACKFILLING OF FOUNDATION , THE SIDES OF DRAINS AND CULVERTS, FLOORS AND PLINTH IN LAYERS NOT EXCEEDING I50MM THICK. INCLUDING WATERING AND CONSOLIDATING ETC. COMPLETE AS PER STANDARD SPECIFICATION AND INSTRUCTED BY BHEL ENGINEER.					
A	(A)	WITH **GOOD EXCAVATED SOIL** AVAILABLE FROM THE EARTH WORK.	M3	669.00	0.67		
B	(B)	WITH **GRANULAR MURUM** IN LAYERS (THICKNESS OF EACH LAYER SHOULD NOT EXCEED 150MM) BELOW FOUNDATIONS, FLOORING, AND RAMP ETC AS PER STANDARD SPECIFICATION, RELEVANT DRAWINGS AND INSTRUCTED BY BHEL ENGINEER INCLUDING ROYALTY. CONTRACTOR HAS TO SUBMIT ROYALTY CERTIFICATE FROM CONCERNED STATE GOVT. MINING DEPARTMENT	M3	130.00	4.96		
D	(D)	WITH **GOOD** EARTH BROUGHT FROM OUTSIDE FROM CONTRACTOR'S OWN SOURCE INCLUDING ROYALTY ETC.	M3	86.00	2.72		
E	(E)	PROVIDING & FILLING IN **SOAK PIT WITH BRICK BATS 40-80MM** INCLUDING SAND PACKING ETC. COMPLETE, AS PER STANDARD SPECIFICATION AND INSTRUCTED BY BHEL ENGINEER.	M3	9.00	4.65		
		PCC:					
11	C12	PROVIDING AND LAYING OF **PLAIN CEMENT CONCRETE OF MIX 1:4:8** USING PPC **CONFIRMING TO IS** GRADED STONE AGGREGATE 20 MM NOMINAL SIZE FOR FOUNDATION, FLOORING, COLUMN ETC. INCLUDING SHUTTERING, FINISHING, CURING, CONSOLIDATION ETC. COMPLETE AS PER STANDARD SPECIFICATIONS AND AS DIRECTED BY BHEL ENGINEER.	M3	214.00	25.99		
12	C13	PROVIDING AND LAYING OF **100 MM THICK PLAIN CEMENT CONCRETE OF MIX 1:3:6** USING PPC **CONFIRMING TO IS** AND GRADED STONE AGGREGATE 20 MM NOMINAL SIZE FOR **PLINTH PROTECTION** WITH TROWEL FINISH INCLUDING SHUTTERING, FINISHING, CURING, CONSOLIDATION ETC. COMPLETE AS PER STANDARD SPECIFICATIONS AND AS DIRECTED BY BHEL ENGINEER.	M3	22.00	33.86		
13	C14	PROVIDING AND LAYING OF **RCC MIX 1:2:4** USING PPC **CONFIRMING TO IS** AND GRADED STONE AGGREGATE 20 MM NOMINAL SIZE INCLUDING MECHANICAL MIXING, VIBRATION, CURING, FORM WORK & CENTERING AS PER DRAWING AND SPECIFICATION AND DIRECTED BY BHEL ENGINEER BUT EXCLUDING COST OF REINFORCEMENTS.	M3	232.00	33.86		
14	C17	PROVIDING AND LAYIN G **DPC** (DAMP PROOF COURSE) 50MM THICK IN 1:2:4 CEMENT CONCRET LAYER USING PPC **CONFIRMING TO IS** AND WITH 6 MM DOWN AGGREGATE, INCLUDING FORMWRK, BITUMEN FELT USING CEMENT WITH WATER PROOFING COMPOUND ETC. COMPLETE	M2	115.00	2.18		
		REINFORCEMENT:					
15	C18	PROVIDING, CUTTING, BENDING AND FIXING IN POSITION **REINFORCEMENT OF VARIOUS DIA.** USING **HIGH TENSILE TOR STEEL (Fe - 415/500) FOR FOUNDATIONS, COLUMNS, BEAMS, FLOORS, SUNSHED, SLAB ETC.** AS PER DRAWING AND SPECIFICATION AND AS DIRECTED BY BHEL ENGINEER INCLUDING COST OF ALL MATERIALS, LEADS, LIFT, LABOURS, MS BINDING WIRE 18/20 GAUGE, TACK WELDING AND SUPPORTING IF REQUIRED COMPLETE.	MT	17.00	440.84		
		BRICK WORK:					
16	C19	PROVIDING **BRICK WORK IN CM 1:6** (1 CEMENT & 6 COARSE SAND) USING PPC **CONFIRMING TO IS** AND **LOCALLY AVAILABLE BURNT CLAY BRICKS** (MIN STRENGTH 35 KG/CM^2) AS PER DRAWING AND SPECIFICATION FOR FOUNDATION, SUPER STRUCTURE, SEPTIC TANK, DRAIN, CULVERTS ETC. INCLUDING COST OF ALL MATERIALS, LABOUR, SCAFFOLDING, CURING , AT ALL ELEVATIONS AND LEVELS , RAKING OUT JOINTS ETC. COMPLETE AND AS DIRECTED BY ENGINEER . EXCLUDING PLASTERING & PAINTING.	M3	141.00	35.30		
17	C20	PROVIDING **BRICK WORK IN CM 1:6** (1 CEMENT & 6 COARSE SAND) USING PPC AND **FLY ASH LIME BRICKS** (FAL - MIN STRENGTH 35 KG/CM^2) AS PER DRAWING AND SPECIFICATION FOR FOUNDATION, WALL, SEPTIC TANK, DRAINS, CULVERTS ETC. INCLUDING COST OF ALL MATERIALS, LABOUR, SCAFFOLDING, CURING , AT ALL ELEVATIONS AND LEVELS , RAKING OUT JOINTS ETC. COMPLETE AND AS DIRECTED BY ENGINEER . EXCLUDING PLASTERING & PAINTING.	M3	101.00	33.97		
18	C21	PROVIDING **HALF BRICK WORK PARTITION WALL IN CM 1:4** (1 CEMENT & 4 COARSE SAND) USING PPC **CONFIRMING TO IS** AND **LOCALLY AVAILABLE BURNT CLAY BRICKS** (MIN STRENGTH 35 KG/CM^2) AS PER DRAWING AND SPECIFICATION FOR FOUNDATION, WALL ETC INCLUDING COST OF ALL MATERIALS, LABOUR, SCAFFOLDING, RAKING OUT JOINTS,CURING AS PER DRAWING AND DIRECTED BY BHEL ENGINEER.	M2	6.00	4.30		
19	C22	PROVIDING **HALF BRICK WORK FOR PARTITION WALL IN CM 1:4** (1 CEMENT & 4 COARSE SAND) USING PPC AND **FLY ASH LIME BRICKS** (FAL - MIN STRENGTH 35 KG/CM^2) AS PER DRAWING AND SPECIFICATION FOR FOUNDATION, WALL ETC INCLUDING COST OF ALL MATERIALS, LABOUR, SCAFFOLDING, RAKING OUT JOINTS,CURING AS PER DRAWING AND DIRECTED BY BHEL ENGINEER.	M2	3.00	4.30		
		STRUCTURAL STEEL WORK:					
20	C23	**DESIGN, SUPPLY, FABRICATING AND ERECTION OF TUBULAR TRUSSES WITH TUBULAR POST & PURLINES (BY USING CLASS B, MEDIUM QUALITY PIPE)** AS PER BHEL DRAWING WITH **WIND TIES (USING FLAT OF SIZE 40X5MM)** TO BE PROVIDED ABOVE SHEETS AND PROVIDING AND FIXING BASE PLATES WITH HOLDING DOWN BOLTS ON RCC COLUMNS, GUSSETS, RIBS, PINS, SPLICES ETC. AS REQUIRED INCLUDING TRANSPORT, LOADING, UNLOADING CHARGES FROM FABRICATION SHOP TO SITE ETC. COMPLETE. RATE IS INCLUSIVE OF ALL MATERIALS, LOADING & UNLOADING, FABRICATION, FIXING IN POSITION, LABOUR CHARGES , T&Ps AND COST OF RED OXIDE PRIMER AND TWO COATS OF SYNTHETIC ENAMEL PAINTS (OVER PRIMER COAT OF RED OXIDE) OF APPROVED COLOUR AND QUALITY AT SITE. **HOLLOW TRUSS (OUTER MAIN FRAME WITH CENTER POST EXCEPT OTHER VERTICAL & CROSS BRACING/ TUBES/ CROSS STUD) SHALL BE PROVIDED ON BOTH SIDE OF GABLE END TO FIX THE PURLINS AND ROOFING MATERIAL.**	MT	29.00	488.24		

SL.NO	ITEM CODE	DESCRIPTION OF WORK	UNIT	QUANTITY	Factor (F)	Rate (A X F) / 100000	Amount
21	C24	**DESIGN, SUPPLY, FABRICATING AND ERECTION OF STRUCTURAL STEEL STAGING** (APPROX. Ht. 4.0M) FOR **INSTALLATION OF PVC OVER HEAD WATER TANK (OHT)** OF CAPACITY- 1000 LITRES AS PER BHEL DRAWING. RATE IS INCLUSIVE OF ALL MATERIALS, LOADING & UNLOADING, FABRICATION, FIXING IN POSITION, LABOUR CHARGES , T&Ps AND COST OF RED OXIDE PRIMER AND TWO COATS OF SYNTHETIC ENAMEL PAINTS (OVER PRIMER COAT OF RED OXIDE) OF APPROVED COLOUR AND QUALITY AT SITE.	MT	1.00	488.24		
22	C25	PROVIDING , SUPPLYING AND FIXING OF **20 GAUGE MS ROLLING SHUTTERS** OF SIZE **5 M X 5 M (APPROX.)** AS PER I.S. SPECIFICATIONS, COMPLETE, **MECHANICALLY OPERATED** FROM IN AND OUTSIDE BOTH AS INSTRUCTED BY BHEL ENGINEER INCLUDING TWO COATS OF SYNTHETIC ENAMEL PAINT OF APPROVED COLOUR AND QUALITY OVER ONE COAT OF RED OXIDE PRIMER, LOCKING ARRANGEMENT. RATE SHALL BE INCLUSIVE OF ALL THE ABOVE COMPLETE.	M2	102.00	13.55		
		ROOFING:					
23	C26	PROVIDING AND FIXING **0.5MM THICK PERMANANTLY COLOUR COATED PROFILED GS SHEETS INCLUDING RIDGES AND HIPS OVER THE ROOF AND WALL/ SIDE CLADDING OF SHEDS** AS PER BHEL DRAWING INCLUDING GALVANISED IRON J OR L HOOK, BOLTS, BITUMINOUS WASHERS, GI CRAMP BOLTS, NUTS, SCAFOLDING ETC. INCLUDING STEEL PRIMER AND 2 COATS OF APPROVED PAINT AT OVERLAPS AS PER TECHNICHAL SPECIFICATIONS COMPLETE, ALL AS PER LATEST IS 459, 3307 AND 730.	M2	2404.00	7.73		
24	C28	PROVIDING AND FIXING OF **TRANSLUCENT RMP/FRP (FIBRE GLASS REINFORCED PLASTIC) SHEETS - 2.00** MM THICK OF APPROVED MAKE INCLUDING COST OF GI **J** OR **L** HOOKS, BOLTS, NUTS, WASHERS, BITUMEN WASHERS,SCAFOLDING ETC. COMPLETE SO AS TO MATCH WITH PPGI SHEETS FOR NATURAL LIGHTING.	M2	121.00	3.39		
		CEILING:					
25	C29	PROVIDING AND FIXING OF **FALSE CEILING OF 12.5 MM THICK TAPERED EDGE GYPSUM PLAIN BOARD CONFIRMING TO IS:2095 PART I WITH 4MM THICK** PANELS OF APPROVED QUALITY AND DESIGN, OF SIZE 600x600 MM WITH SQUARE EDGES SUPPORTED BY ANODISED ALUMINIUM FRAMES OF TEES 35x23.5x1.5 MM THICK AS MAIN MEMBER AND 19x23.5x1.5 MM TEES AS CROSS SUPPORTING MEMBERS AND WALL ANGLES OF 23.5x23.5x1.5MM. THE MAIN RUNNERS SHALL BE SUSPENDED FROM ROOF AT 1200 MM CENTRE TO CENTRE BY MEANS OF MS RODS WITH GI 'J' THREADED HOOK FOR ADJUSTMENTS. THE CROSS RUNNERS SHALL BE FIXED TO MAIN RUNNER TO FORM '**A**' **GRID PATTERN** OF 600x600MM AND PROVIDING 25 MM WIDE ALUMINIUM STRIP TEES OR MOULDED SECTIONS AT ALL JOINTS. THE RATE SHALL BE INCLUSIVE OF TWO COATS OF APPROVED OBD ON GYPSUM BOARD, SUPPLY & FIXING OF ALUMINIUM FRAME AND SCAFOLDING ETC. COMPLETE.	M2	190.00	5.34		
		DOORS & WINDOWS:					
26	C31	PROVIDING AND FIXING OF **BEST QUALITY COUNTRY WOOD DOORS** COMPRISING OF **FRAME 95 X 70MM OF HARD WOOD (SECOND CLASS TEAK WOOD) AND 38/40MM THICK FLUSH SHUTTERS OF SOLID CORE TYPE,** CONFORMING TO IS: 2202 (PART I) USING COMMERCIAL PLY INCLUDING HOLD FASTS, WIND APPLIANCES, HANDLES, TOWER BOLTS AND ALDROPS, MORTISE OR SUITABLE LOCKS ETC. AS PER THE STANDARD PRACTICE AND APPLYING TWO COATS OF SYNTHETIC ENAMEL PAINT OF APPROVED SHADE & COLOR OVER A COAT OF PRIMER AS DIRECTED BY BHEL ENGINEER.	M2	17.00	15.82		
27	C32	PROVIDING AND FIXING OF **BEST QUALITY PVC PANELLED DOORS OF THICKNSS 29MM, SINTEX/BAJAJ MAKE OR APPROVED EQUIVALENT** FOR TOILETS INCLUDING ALL FITTINGS AND FIXTURES, MS ANGLE FRAME OF SIZE 40x40x6MM ETC. ALL COMPLETE AS PER DRAWINGS AND SPECIFICATIONS.	M2	2.00	16.84		
28	C33	PROVIDING AND FIXING OF **18 GUAGE M.S. SHEET DOOR** WITH FRAME WORK **40 X 40 X 6 MM M.S. ANGLE** INCLUDING LOCKING ARRANGEMENTS, HOLD FAST , APPLYING ANTICORROSSIVE PRIMER COAT OF RED LEAD PAINT AND 2 COATS OF SYNTHETIC ENAMLE PAINT OF APPROVED COLOUR COMPLETE AS DIRECTED BY BHEL ENGINEER.	M2	3.00	19.50		
29	C34	SUPPLY FABRICATION, AND FIXING IN POSITION OF **MS GATES** WITH STRUCTURAL/TUBULAR STEEL FRAMES AS PER BHEL DRAWING INCLUDING COST OF FOUNDATION & POSTS, PAINTING TWO COATS BY SYNTHETIC ENAMEL PAINT OF APPROVED COLOUR AND QUALITY OVER ONE COAT OF RED OXIDE PRIMER, COST OF ALL MATERIALS, LABOUR, TRANSPORT ETC. COMPLETE.	MT	5.00	488.24		
30	C35	SUPPLYING, MANUFACTURING AND FIXING IN POSITION OF **STEEL WINDOWS AND VENTILATORS** INCLUDING FRAMES & IRON BARRED (GUARD BAR OF SQUARE SECTION @ 100 MM C/C) AND GLAZED WITH 4 MM PLAIN GLASS AS PER STANDARD SPECIFICATIONS & RELEVANT **IS CODE** AND INSTRUCTIONS OF BHEL ENGINEER. THE COST SHALL BE INCLUSIVE OF ALL ACCESSORIES FITTINGS, HOLD FASTS, PAINTING TWO COATS OF SYNTHETIC ENAMEL PAINT OF APPROVED COLOUR AND QUALITY OVER ONE COAT OF RED OXIDE PRIMER ETC. COMPLETE.					
A	A)	**STEEL WINDOWS**	M2	9.00	5.57		
B	B)	**STEEL LOUVERED VENTILATORS :-**	M2	16.00	5.57		
31	C36	PROVIDING AND FIXING OF METALLIC DECORATIVE TYPE **HEAVY DUTY PELMET ROD FOR DOORS AND WINDOWS.** RATE TO INCLUDE ALL NECESSARY FITTING & FIXTURE, LABOUR ETC**.** AS APPROVED BY BHEL ENGINEER.	EACH	5.00	5.23		
32	C37	PROVIDING & FIXING OF **WOODEN FRAME OF BEST QUALITY COUNTRY WOOD (2.5"x3.0")** FOR INSTALLING PORTABLE **1.5T AIR CONDITIONER** (AC) ON THE WALL OPENING, SO AS TO MAKE A FRAME OF INSIDE CLEAR DIMENSION SUITABLE FOR INSTALLATION OF **AC** WITH COMPLETE FINISHING, PAINTING, HOLD FAST ETC. RATE TO INCLUDE ALL NECESSARY FITTING & FIXTURE, LABOUR, MAKING GOOD THE DAMAGED SURFACE ETC. COMPLETE. AS APPROVED BY BHEL ENGINEER.	NOS.	6.00	7.20		
		FLOORING:		0.00			
33	C38	PROVIDING AND FIXING OF **IPS FLOORING 40MM THICK USING PPC** WITH CEMENT CONCRETE 1:2:4 (USING 12 MM DOWN AGGREGATES) AS PER STANDARD PRACTICE IN PANELS OF SIZE NOT EXCEEDING 2.0 x 2.0 SQ.M BY PROVIDING, FIXING GLASS STRIPS.INCLUDING CURING & CLEANING ETC. ALL COMPLETE	M2	1484.00	2.32		
34	C39	PROVIDING AND LAYING OF **5.5 MM THICK CERAMIC TILES** OF REQUIRED SIZE LAID OVER THE BED OF CM - 1:4 (1 CEMENT & 4 COARSE SAND) USING PPC. TILES FROM REPUTED MANUFACTURER LIKE **JONSON OR EQUIVALENT** INCLUDING ALL MATERIALS COMPLETE AS PER STANDARD PRACTICE AND SPECIFICATION.					
	A)	(I) FLOORING- 600MMX600MM	M2	0.00			
	B)	(II) FLOORING - 300MM X 300MM	M2	77.00	5.53		
	C)	(III) SKIRTING - 300MM X 150MM	M2	7.00	5.53		
35	C40	SUPPLYING AND FIXING OF **WHITE GLAZED TILES OF REQUIRED SIZES LAID OVER THE BED OF CM - 1:4 (1 CEMENT & 4 COARSE SAND) USING PPC DADO IN TOILET & PANTRY ROOM UP TO 1.5 M** ELEVATIONS INCLUDING PEREPARATION OF BASE LAYING UNDERBED, FINISHING AND ROUNDING CORNERS AND JUNCTIONS, CURING ETC. COMPLETE AS PER DRAWINGS AND SPECIFICATIONS.					
	A)	(I) FLOORING (5.0MM TO 6.0MM THICK OF SIZE 300MM X 300MM)	M2	28.00	5.45		
	B)	(II) DADO (5MM TO 6MM THICK OF SIZE 150MM X 150MM) - 1.5M HEIGHT FROM FINISHED FLOOR LEVEL	M2	32.00	5.26		
		FINISHING:					
36	C41	PROVIDING **PLASTERING WITH CEMENT MORTAR -1:6 (1 CEMENT & 6 COARSE SAND) USING PPC** OVER BOTH INTERNAL AND EXTERNAL FACES OF BRICKWORK AND CONCRETE SURFACES, PARTITION WALLS ETC. AT ALL LEVELS INCLUDING PREPARING THE SURFACE, RAKING JOINTS, SCAFFOLDING, CURING, COST OF ALL MATERIALS, LABOUR ETC. COMPLETE.					
	A)	(i) EXTERNAL PLASTERING - **18MM THICK**	M2	1611.00	1.31		
	B)	(ii) INTERNAL PLASTERING -**12MM THICK**	M2	2010.00	0.89		
37	C42	PROVIDING **2MM THICK NEAT CEMENT FINISH USING PPC** OVER CONCRETE BASE FOR FLOORING, PAVING, PLASTERED SURFACE ETC. INCLUDING CURING & CLEANING AND SCAFOLDING COMPLETE.	M2	1629.00	0.24		
38	C43	PROVIDING & APPLYING **COLOUR WASH -THREE COATS** ON NEWLY PLASTERED EXTERNAL SURFACE OF WALLS BY USING BEST **SHALE LIME** TO GIVE AN EVEN SHADE INCLUDING PREPARING THE SURFACE LIKE CLEANING AND BRUSHING & BROOMING OF WALLS AND IN ACCORDANCE WITH STANDARD SPECIFICATION. RATE INCLUDE COST OF ALL MATERIALS , COLOURING AGENT, BASE COAT OF WHITE WASH,APPROVED ADDESSIVE, SCAFFOLDING AT ALL LEVEL, BRUSH ETC. COMPLETE.	M2	1611.00	0.13		
39	C44	PROVIDING & APPLYING **WHITE WASH - THREE COATS** ON NEWLY PLASTERED INTERNAL SURFACE OF SHED (EXCLUDING INNER WALL OF OFFICE/C&I ROOM) BY USING BEST **SHALE LIME** TO GIVE AN EVEN SHADE INCLUDING PREPARING THE SURFACE LIKE CLEANING AND BRUSHING & BROOMING OF WALLS AND IN ACCORDANCE WITH STANDARD SPECIFICATION. RATE INCLUDE COST OF ALL MATERIALS , APPROVED ADDESSIVE, SCAFFOLDING AT ALL LEVEL, BRUSH ETC. COMPLETE.	M2	1502.00	0.10		
40	C45	PROVIDING & APPLYING TO INTERIOR SURFACES OF E&C INCHARGE OFFICE, COMMON ROOMS, C&I STORE, TOILET, PANTRY ETC. BY **TWO COATS OF OIL BOUND DISTEMPER (OBD)** OF APPROVED SHADE ,COLOR AND MAKE CONFIRMING TO IS : 428 TO OBTAIN A EVEN FINISH AND UNIFORM COLOR OVER A COAT OF PRIMER AS PER MANUFACTURE RECOMMENDATION INCLUDING COST OF PAINT, SURFACE PREPARATION LIKE CLEANING AND BRUSHING & BROOMING OF WALLS , SCAFFOLDING AT ALL LEVEL ETC, COMPLETE. **SURFACE PREPARATION SHALL BE DONE BY APPLYING PUTTY/PLASTER OF PARISH (POP)** INCLUDING COST OF MATERIAL, LABOUR ETC. COMPLETE. AS PER SPECIFICATIONS AND AS DIRECTED BY BHEL ENGINEER.	M2	436.00	0.53		
41	C46	PROVIDING AND FIXING **OVER HEAD HYDRAULIC DOOR CLOSER** (HEAVY DUTY) OF APPROVED BRAND AND SIZE ON NECESSARY DOORS AS DIRECTED BY BHEL ENGINEER.	NO.	7.00	3.91		
		FENCING:					
42	C47	PROVIDING AND FIXING **BARBED WIRE FENCING** AROUND BHEL ALLOTED AREA **AS PER BHEL DRAWING & AS DIRECTED BY BHEL ENGINEER**. POSTS SHALL BE SPACED AT **3M CENTRES AND STRUTS AT 30M CENTRES** AND AT ALL TURNINGS WITH FOUNDATIONS, SUPPLYING AND FIXING GI BARBED WIRES, 10 HORIZONTAL LINES, TWO DIAGONALS BETWEEN POSTS BY MEANS OF GI STAPLES AS PER STANDARD PRACTICE. THE BARBED WIRE SHALL CONFORM TO IS 278 AND BE MADE OF TWO STRANDS OF GALVANISED TWISTED 2.5MM DIA (12.5 GAUGE) STEEL WIRE WITH FOUR POINT BARS. RATE QUOTED SHALL BE INCLUSIVE OF **EXCAVATION, DISPOSAL OF SURPLUS EARTH, CONCRETE (1:3:6), FORM WORK AND ALL MATERIALS, COST OF POSTS, BARBED WIRES, TRANSPORTING, FIXING IN POSITION** ETC. INCLUDING COST OF ALL LABOUR AND TWO COATS OF ENAMEL PAINT OF APPROVED SHADE WITH A SHOP COAT OF PRIMER IN ALL STRUCTURAL MEMBERS ETC COMPLETE.	RM	350.00	4.62		
		SANITARY/ SEWAGE					

SL.NO	ITEM CODE	DESCRIPTION OF WORK	UNIT	QUANTITY	Factor (F)	Rate (A X F) / 100000	Amount
43	S1	PROVIDING AND FIXING **WHITE GLAZED VITREOUS CHINA WASH HAND BASIN** OF 55 CM X 40 CM SIZE INCLUDING COLD WATER PILLER TAP, BRACKETS, STOP TAP, CHROMIUM PLATED BOTTLE TRAP AND NECESSARY PIPE CONNECTIONS INCLUDING UPVC WASTE PIPE AND TRAP UPTO THE OUT SIDE FACE OF THE WALL, MAKING GOOD THE DAMAGED SURFACE, TESTING ETC. COMPLETE. PRIOR APPROVAL OF SAMPLE AND BRAND BY BHEL ENGINEER IS NECESSARY BEFORE USE.	NO	2.00	11.27		
44	S2	PROVIDING AND FIXING **EUROPEAN TYPE WHITE GLAZED VITREOUS CHINA W.C.PAN** WITH UPVC SEAT AND LID WITH CHROMIUM PLATED BRASS HINGES AND RUBBER BUFFERS INCLUDING UPVC VENT PIPE (APPROX. 2M. HT. WITH COWL) ON THE OUTSIDE FACE OF WALL, 10 LITRE PVC LOW LEVEL FLUSHING CISTERN WITH ALL FITTINGS, PIPE AND STOP COCK, BRACKETS FOR FIXING CISTERN, 32 MM DIA. UPVC FLUSH PIPE WITH FITTINGS AND CLAMPS, 20 MM DIA. UPVC OVERFLOW PIPE, FLOAT VALVES, CUTTING AND MAKING GOOD TO THE WALLS AND FLOORS, TESTING ETC. COMPLETE. PRIOR APPROVAL OF SAMPLE AND BRAND BY BHEL ENGINEER IS NECESSARY BEFORE USE.	NO	1.00	21.15		
45	S3	PROVIDING AND FIXING IN POSITION OF **WHITE GLAZED EARTHENWARE** FLAT BACK/CORNER TYPE LIPPED FRONT **URINALS OF 430MM X 260MM X 350MM / 340X460X265 MM** OF APPROVED MAKE AND QUALITY WITHOUT FLUSHING CISTERN, GI FLUSH PIPE AND SPREADERS WITH BRASS UNIONS, GI CLAMPS, CUTTING OF WALLS AND MAKING GOOD OF ALL DAMAGES AND FINISHING TO MATCH THE EXISTING WORK ETC. COMPLETE. RATE QUOTED SHALL INCLUDE COST OF ALL MATERIALS AND LABOUR FOR CARRYING, LAYING & FIXING AND ALL OTHER INCIDENTAL CHARGES ETC. COMPLETE.	NO	78.00	21.04		
46	S4	PROVIDING AND FIXING IN POSITION OF **HIGH CLASS BELGIUM OR SUPERIOR MAKE BEVELLED EDGE MIRROR OF SIZE 450MM X 550MM X 6MM** WITH **16 MM DIA & 550MM LENGTH NICKEL PLATED TOWEL ROD MOUNTED** ON 6 MM THICK PLYWOOD OR PLASTIC FOLDER SHEET. RATE TO INCLUDE COST OF ALL MATERIALS, LABOUR FOR FIXING THE WOODEN PLUGS WITH CP BRASS SCREWS AND WASHERS ETC. COMPLETE.	NO	1.00	5.06		
47	S5	PROVIDING AND FIXING IN POSITION OF 15 MM DIA **CONCUSSION PUSH BUTTON** TYPE BRASS/ **GUN METAL SELF CLOSING TAP** INCLUDING NECESSARY SOCKET, TESTING ETC COMPLETE FOR URINALS AS DIRECTION OF BHEL ENGINEER.	NO	2.00	0.80		
48	S6	PROVIDING AND FIXING IN POSITION OF **15 MM DIA NOMINAL SIZE SCREW DOWN TYPE CHROMIUM PLATES BRASS BIB COCKS** OF STANDARD TYPE OF APPROVED MAKE AND QUALITY (LEADER MAKE OR EQUIVALENT) AS PER STANDARD SPECIFICATION.RATE INCLUDES JOINTING MATERIALS,SOCKETS,UNION NUT,TESTING, LABOURS FOR CARRYING AND FIXING ETC. COMPLETE	NO	3.00	3.04		
49	S7	PROVIDING AND FIXING IN POSITION OF **25 MM DIA GATE VALVE. INCLUDING ALL NECESSARY FITTING & FIXTURE ETC. COMPLETE** AS PER STANDARD SPECIFICATION.	NO	1.00	2.84		
50	S8	PROVIDING AND FIXING IN POSITION OF **40 MM DIA GATE VALVE. INCLUDING ALL NECESSARY FITTING & FIXTURE ETC. COMPLETE** AS PER STANDARD SPECIFICATION.	NO	1.00	3.87		
51	S9	PROVIDING AND FIXING IN POSITION OF **15 MM DIA** NOMINAL SIZE SCREW DOWN TYPE CHROMIUM PLATES BRASS **STOP COCKS** OF APPROVED MAKE AND QUALITY (LEADER MAKE OR EQUIVALENT) AS PER STANDARD SPECIFICATION.RATE INCLUDES COST OF JOINTING MATERIALS, SOCKETS,UNION NUT,TESTING, LABOURS FOR CARRYING AND FIXING ETC. COMPLETE	NO	86.00	2.28		
52	S10	PROVIDING AND FIXING IN POSITION OF **100MM X 50MM HCI "NAHANI" TRAP** WITH HCI GRATINGS, BENDS, CONNECTING PIECES OF CI PIPE UPTO OUTSIDE FACE OF THE WALL. MAKING GOOD THE DAMAGED SURFACE,TESTING ETC **COMPLETE** AS PER STANDARD SPECIFICATIONS. RATE TO BE ALL INCLUSIVES.	NO	4.00	0.19		
53	S11	PROVIDING AND FIXING IN POSITION OF **150MM SALT GLAZED STONE WARE GULLY TRAP WITH HCI GRATINGS** AND CI COVER OF SIZE 300X300 MM OF APPROVED MAKE (WEIGHT NOT LESS THAN 2 KG) AND QUALITY AS PER STANDARD SPECIFICATIONS. RATE TO BE ALL INCLUSIVE.	NO	2.00	10.26		
54	S12	PROVIDING AND LAYING WITH REQUIRED GRADING & LEVELING IN TRENCHES **MEDIUM GRADE (TYPE) GALVANISED IRON (G I) PIPE** HAVING EMBOSSED ISI MARK ON IT, OF REQUIRED DIAMETER WITH SCREWED, SOCKETS, JOINTS, NECESSARY GALVANISED IRON FITTINGS SUCH AS SOCKETS, BACK NUTS, ELBOWS, BENDS, TEES, REDUCERS, ENLARGERS, PLUGS, CLAMPS ETC. INCLUDING ALL NECESSARY EXCAVATION / CUTTING OF WALLS, BACK FILLING/ MAKING GOOD THE WALLS, FIXING WITH CLAMPS, TESTING ETC. COMPLETE. (PRIOR APPROVAL OF SAMPLE AND BRAND BY BHEL ENGINEER IS NECESSARY BEFORE USE.) RATE TO INCLUDE EARTH WORK EXCAVATION IN ALL SOILS, INCLUDING HARD ROCK REQUIRING BLASTING , SHORING, BALLING OR PUMPING OUT OF WATER WHEREVER REQUIRED, REMOVAL OF SLUSH ETC. REMOVING AND DEPOSITING SURPLUS EARTH AS DIRECTED BY THE BHEL ENGINEER INCLUDING ALL LEADS AND LIFTS AS PER SITE CONDITIONS.					
A	A)	40MM DIA	RM	100.00	2.17		
B	B)	25MM DIA	RM	50.00	1.87		
C	C)	20MM DIA	RM	25.00	1.47		
D	D)	15MM DIA	RM	20.00	1.20		
55	S13	PROVIDING AT WORKING SITE, CARRYING AND LOWERING INTO TRENCHES, LAYING TO PROPER ALIGNMENT, LEVEL AND GRADE, JOINTING WITH CM (1:1) AND TESTING OF JOINTS ETC. OF THE FOLLOWING SIZE OF SALT **GLAZED STONEWARE PIPE** INCLUSIVE OF ALL NECESSARY SPECIALS TARRED HEMP YARN AND ALL JOINTING MATERIALS COMPLETE AS PER STANDARD SPECIFICATIONS INCLUDING ALL NECESSARY EXCAVATION ,BACKFILLING,DISPOSAL OF SURPLUS EARTH ,LEAD AND LIFT AS PER SITE CONDITIONS. RATE SHALL INCLUDE COST OF ALL MATERIALS, LABOUR CHARGES AND INCIDENTAL CHARGES ETC. COMPLETE.					
A	A)	100MM DIA **STONEWARE PIPELINE** INCLUDING ALL SPECIALS COMPLETE.	RM	50.00	1.20		
56	S17	PROVIDING AND FIXING IN POSITION OF **PVC OVERHEAD WATER TANK OF SYNTEX OR ANY APPROVED MAKE OF 1000 LITRE CAPACITY** WITH PROVISION FOR OVERFLOW ARRANGEMENT VALVES, INLET AND OUTLET ETC. COMPLETE. SUPPORTING STEEL STRUCTURE FOR FIXING THE TANK SHELL BE PAID IN THE RELEVANT ITEM.	NO	1.00	41.76		
57	S18	CONSTRUCTION OF 230MM THICK BURNT CLAY / FLY ASH LIME **BRICK CHAMBER** USING PPC OF THE FOLLOWING DIMENSIONS (INNER DIMENSION) WITH 20MM THICK INTERNAL & EXTERNAL CEMENT PLASTER OF MIX CM 1:5 (1 CEMENT & 5 COARSE SAND) , NEAT CEMENT FINISH , TOP **CI – COVER** AND CONNECTORS FOR SEWER LINES. RATE SHALL BE INCLUSIVE OF ALL NECESSARY EXCAVATION & FILLING, PCC-100 MM THICK OF 1:3:6 FOR BEDDING ON 100MM THICK OVERSIZER SOLING WITH 80 MM METAL ETC. COMPLETE.					
A	A)	600X450X450 WITH C.I COVER	NO	2.00	28.03		
B	B)	900X600X450 WITH C.I. COVER	NO	3.00	36.27		
58	S18	PROVIDING AND FIXING OF **PRECAST 80 MM THICK RCC COVER** OF MIX 1:1.5:3 FOR MAN HOLES OF VARIOUS SIZES WITH REINFORCEMENT OF 10 MM DIA BOTH WAY TIED WITH TACK WELDING @ 150 MM C/C WITH 2 HOOKS OF 12 MM DIA BARS ETC.COMPLETE.					
A	A)	750MM x 600MM	Nos.	2.00	4.64		
B	B)	1050MM x 750MM	Nos.	3.00	6.96		
59	S19	PROVIDING AND FIXING **CHROMIUM PLATED TOWEL ROD 16 MM DIA**. AND 75CM. IN LENGTH INCLUDING ALL ACCESSORIES COMPLETE. (PRIOR APPROVAL OF SAMPLE AND BRAND BY BHEL ENGINEER IS NECESSARY BEFORE USE).	NO.	1.00	2.97		
60	S20	PROVIDING & FIXING OF **LIQUID SOAP DISPENSER** AT ALL WASH BASIN LOCATION.	NO.	1.00	1.20		
61	S21	PROVIDING AND FIXING OF **AQUA-GUARD / KENT R.O. OR EQUIVALENT WATER PURIFIER (CAPACITY- 10 Litre),** ALONG WITH ALL FITTINGS. RATE TO INCLUDE ALL NECESSARY FITTINGS & FIXTURES, LABOUR ETC.AS APPROVED & DIRECTED BY BHEL ENGINEER.	NOS.	1.00	110.92		
62	S22	PROVIDING AND FIXING OF 1 No. **18"X24" SIZE STAINLESS STEEL SINK** WITH ALL FITTINGS LIKE DRAIN PIPE, STOP VALVE ETC.RATE TO INCLUDE ALL NECESSARY FITTING & FIXTURE, LABOUR ETC.AS APPROVED & DIRECTED BY BHEL ENGINEER.	NOS.	1.00	29.42		
63	S23	PROVIDING AND FIXING **40MM THICK BEST QUALITY 18 MM THICK** GANG SAW CUT, MIRROR POLISHED, PREMOULDED AND PREPOLISHED, MACHINE CUT **GRANITE SLAB** FOR KITCHEN PLATFORMS OF REQUIRED SIZE, APPROVED SHADE, COLOUR AND TEXTURE LAID OVER 20 MM THIICK BASE CM 1:4 (1 CEMENT : 4 COARSE SAND), JOINTS TREATED WITH WHITE CEMENT, MIXED WITH MATCHING PIGMENT, EPOXY TOUCHUPS, INCLUDING RUBBING, CURING, MOULDING AND POLISHING TO EDGES TO GIVE HIGH GLOSS FINISH etc.. COMPLETE OF REQUIRED SHAPE FOR FIXING SS SINK FOR KITCHEN COUNTER AND RACKS FOR KITCHEN STORE AREA ETC.COST INCLUSIVE OF MAKING OPENING AND FINISHING COMPLETE.	SQM	3.00	24.69		
64	S25	PROVIDING & FIXING IN POSITION OF **CI VENT PIPE OF DIA. 100MM (APPROX. HT. 3M) IN SEPTIC TANK.** RATE TO INCLUDE ALL NECESSARY FITTING & FIXTURE, LABOUR ETC.	RM	4.00	7.11		
		TOTAL VALUE OF SECTION- A IN Rs.					
		(B) ELECTRICALS WORKS					

SL.NO	ITEM CODE	DESCRIPTION OF WORK	UNIT	QUANTITY	Factor (F)	Rate (A X F) / 100000	Amount
65	E1	SUPPLY & INSTALLING **3 PHASE METERING AND POWER DISTRIBUTION BOARD** COMPLETE WITH : (1) INCOMING SFU TPN 400 AMPS- 1NO, (2) OUTGOING SFU TPN 200 AMPS -2NOS. (3) OUTGOING SFU TPN 100 AMPS -2NOS. (4) OUTGOING SFU TPN 32 AMPS -2NOS. 3 PHASE ELECTRONIC ENERGY METER - BHEL / L&T / GEC MAKE. AMMETER, VOLTMETER AND SELECTOR SWITCHES FOR BOTH - AE AND KAYCEE MAKE. PHASE INDICATION LAMPS, HRC FUSES FOR IC AND OG FEEDERS, CABLE GLANDS, POWER TERMINALS FOR CABLES TERMINATION, CABLE LUGS AND PROVISION FOR DOUBLY EARTHING THE PANEL ENCLOSURE. PANEL ENCLOSURE SHALL BE MADE OF SHEET METAL THICKNESS NOT LESS THAN 1.6 MM AND SUITABLE FOR OUT DOOR INSTALLATION, MODULAR CONSTRUCTION, HINGED DOOR WITH LOCKING ARRANGEMENT, BASE FRAME, SHOULD HAVE SLOPPED CANOPY, DULY PAINTED WITH FIRST COAT OF PRIMER AND TWO COATS OF SYNTHETIC ENAMEL PAINT (INTERIOR WITH WHITE PAINT AND EXTERIOR WITH LIGHT GREY AS PER SHADE 5, IS 630) INTERNAL POWER DISTRIBUTION TO DEVICES SHALL BE WITH AL BUSBARS OR COPPER FLEXIBLE SINGLE CORE PVC CABLES OF 1.1 KV GRADE, CONTROL WIRING WITH 1.5 SQMM, SUITABLE STOOL MADE OUT OF MS STRUCTURE OF 1.2 METER HIGH FOR MOUNTING OF PANEL WITH ANCHORING ARRAGEMENTAT FOUNDATION, SUITABLE FOR BOTTOM ENTRY OF CABLES.	NO.	1.00	638.68		
66	E3	SUPPLYING & INSTALLING **POWER DISTRIBUTION BOARD FOR COVERED STORAGE SHEDS** COMPLETE WITH: COMMON BOARD FOR ALL SHEDS. 1) INCOMING MCB TPH 100 AMPS. - 1 NO. 2) OUTGOING MCB TPH 32 AMPS. -3NOS. 3) RCCB DP 25/20 AMPS. - 2NOS. 4) OUTGOING MCB SP 6 AMPS - 6NOS. All RCCBs, MCBs SHALL BE MDS/INDO KOPP MAKE. DISTRIBUTION BOARDS SHALL BE SIEMENS / MDS / INDO KOPP MAKE WITH INTERNAL BUSBARS, INTERNAL WIRING, 2 NOS. EARTHING TERMINALS, EARTH CONNECTIONS, INCLUDING GLANDS, LUGS.	Set	2.00	232.65		
67	E4	SUPPLYING, PROVIDING **SUITABLE FOUNDATION FOR MOUNTING 415 VOLT AC POWER FEEDER PILLAR BOARD** AS SPECIFIED IN SL. NO.12, INSTALLATION & COMMISSIONING OF PANEL	NO	2.00	18.91		
68	E7	SUPPLYING & FIXING **WALL MOUNTING TYPE LIGHTING PANELS**, EACH WITH. (1) INCOMING MCB TPN -32 AMPS - 1NO. (2) RCCB DP 32 AMPS - 3NOS (3) MCB SP 6AMPS - 30 NOS. ALL MCBS AND RCCBS SHALL BE OF MDS / INDO KOPP MAKE. LIGHTING PANEL SHALL BE SIEMENS/MDS/INDO KOPP MAKE WITH INTERNAL BUSBARS, 2 NOS. EARTHING TERMINALS, EARTH CONNECTIONS, INCLUDING GLANDS, LUGS & WIRING FROM MAIN DB.		2.00	133.66		
69	E8	SUPPLYING, PROVIDING AND INSTALLING **WIRING USING 2.5 SQ.MM** COPPER CONDUCTOR THROUGH PVC CONDUIT OF REQUIRED SIZE WITH ACCESSORIES AND FIXTURES. WIRING SHALL BE CONCEALED TYPE FOR MAIN OFFICE, COMMON ROOMS, E&C INCHARGE OFFICE & FOR REST OF SHEDS OPEN AND WHRERVER REQUIRED IN PVC CONDUIT OF REQUIRED SIZE. THE MAKE OF THE WIRE SHALL BE ONLY FROM KEI/ POLY CAP / HAVELLS/ FINALEX/ L & T / STANDARD.	RM	240.00	0.93		
70	E9	SUPPLYING, PROVIDING AND INSTALLING **WIRING USING 4.0 SQ.MM.** COPPER CONDUCTOR THROUGH PVC CONDUIT OF REQUIRED SIZE WITH ACCESSORIES AND FIXTURES. WIRING SHALL BE CONCEALED TYPE FOR MAIN OFFICE, COMMON ROOMS, E&C INCHARGE OFFICE & FOR REST OF SHEDS OPEN AND WHRERVER REQUIRED IN PVC CONDUIT OF REQUIRED SIZE. THE MAKE OF THE WIRE SHALL BE ONLY FROM KEI / POLY CAP/ HAVELLS/ FINOLEX/L&T/STANDARD.	RM	99.00	1.13		
71	E10	SUPPLYING, PROVIDING AND INSTALLING **WIRING USING 6.00 SQ.MM** COPPER CONDUCTOR THROUGH PVC CONDUIT OF REQUIRED SIZE WITH ACCESSORIES AND FIXTURES OF ISI MAKE. WIRING SHALL BE CONCEALED TYPE FOR WHEREVER REQUIRED AS PER INSTRUCTION OF BHEL ENGINEER IN PVC CONDUIT OF REQUIRED SIZE. THE MAKE OF THE WIRE SHALL BE ONLY FROM KEI / POLY CAP/ HAVELLS/ FINOLEX/L&T/STANDARD.	RM	83.00	1.43		
72	E11	SUPPLYING, PROVIDING AND INSTALLING **WIRING USING 16.00 SQ.MM** COPPER CONDUCTOR THROUGH PVC CONDUIT OF REQUIRED SIZE WITH ACCESSORIES AND FIXTURES OF ISI MARK WIRING SHALL BE CONCEALED TYPE FOR WHRERVER REQUIRED AS PER INSTRUCTION OF BHEL ENGINEER IN PVC CONDUIT OF REQUIRED SIZE. THE MAKE OF THE WIRE SHALL BE ONLY FROM KEI / POLY CAP/ HAVELLS/ FINOLEX/L&T/STANDARD..	RM	59.00	2.92		
73	E12	SUPPLYING, PROVING AND INSTALLATION OF **WIRING FANS/COOLERS USING 2.5 SQ.MM** COPPER CONDUCTOR OF ISI MARK THROUGH PVC CONDUITS WITH ACCESSORIES AND FIXTURES. THIS INCLUDES ALL MODULAR FITTINGS ETC. COMPLETE.	RM	48.00	4.82		
74	E13	SUPPLYING, POVIDING AND INSTALLATION OF **PLUG POINT OF 5A SOCKET** (ANCHOR OR EQUV.) OUTLET INCLUDING WIRING TERMINATION. THIS INCLUDES TUBE LIGHT FITTINGS ETC. COMPLETE.	NO	17.00	2.12		
75	E14	SUPPLYING, POVIDING AND INSTALLATION OF **PLUG POINT OF 15A SOCKET** (ANCHOR OR EQUV.) OUTLET INCLUDING WIRING TERMINATION. THIS INCLUDES TUBE LIGHT FITTINGS ETC. COMPLETE.	NO	9.00	2.72		
76	E15	SUPPLYING AND FIXING **ORDINARY TUBELIGHT WITH FRAME** OF STANDARD MANUFACTURER LIKE PHILIPS/BAJAJ OR EQUIVALENT AS APPROVED BY BHEL. THIS INCLUDES TUBE LIGHT FITTINGS ETC. COMPLETE.	NO.	44.00	2.49		
77	E16	SUPPLYING AND FIXING **EXHAUST FANS 12" DIAMETER** WITH FRAME OF STANDARD MANUFACTURER LIKE CROMPTAN GREEVES OR EQUIVALENT AS APPROVED BY BHEL.	N0.	9.00	14.76		
78	E17	SUPPLYING & FIXING **HEAVY DUTY PLUG POINT 15 AMPS (** ANCHOR MAKE OR EQUV.) WITH ONE SWITCH FOR COMPUTER ,ONE FOR AC CONNECTION WITH BOARD ETC COMPLETE.	NO.	7.00	2.83		
79	E18	SUPPLYING AND FIXING METAL CLAD PLUG AND **MCB** OF 30AMPS. (CROMPTON/MDS MAKE) FOR AIR CONDITIONER WITH BOARD ETC COMPLETE.	NO.	4.00	3.93		
80	E19	SUPPLYING AND FIXING **CEILING FAN 48" DIAMETER** OF APPROVED COMPANY SUCH AS CROMPTAN GREEVES OR ANY OTHER STANDARD MANUFACTURER AS DIRECTED BY BHEL. THIS INCLUDES TUBE LIGHT FITTINGS ETC. COMPLETE.	NO	6.00	9.77		
81	E21	PROVIDING AND FIXING **CALLING BELLS** (WITH INDICATOR LIGHT) OF STANDARD MANUFACTURER OR EQUIVALENT AS APPROVED BY BHEL INCLUDING ALL FITTINGS.	NO	2.00	0.40		
82	E22	SUPPLYING, INSTALLATION & COMMISSIONING OF **WEATHER PROOF FLOOD LIGHT LUMINIARIES**, (FBD 1425/40-WITH HIGH PRESSURE SODIUM VAPOUR LAMP 1X 400 WATT ALONG WITH NON- INTEGRAL TYPE CONTROL GEAR BOX HAVING ADEQUATE NUMBER OF TERMINAL CONNECTORS FOR TERMINATING TWO CABLE OF 3X 10 SQMM AL AND SUITABLE FOR OUT DOOR APPLICATION) INCLUDING SUPPLY & FIXING CABLES BETWEEN THE CONTROL GEAR BOX AND LIGHT LUMINIARIES AND MOUNTING FIXTURE WITH HARDWARE FOR MOUNTING OF LIGHT LUMINIARIES AND CONTROL GEAR BOX ON POLE TYPE 410 SP-28. CONTROL GEAR BOX, CABLING & TERMINATION.	NOS.	3.00	34.11		
83	E23	SUPPLY, INSTALLATION & COMMISSIONING OF **SODIUM VAPOUR LAMP STREET LIGHT FITTING 150 WATT** SSG-2315 IH OF CROMPTON OR SIMILAR PHILIPS MAKE, COMPLETE WITH ONE PIECE CANOPY, INTEGRAL CONTROLGEAR COMPRISING OF COPPER WOUND CHOKE , IGNITOR , HPF CAPACITOR, HPSV LAMP AND SUITABLE FOR DIRECTLY SLIPPING OVER LIGHT MOUNTING BRACKET MADE OUT OF 40 MM OD PIPE AND SUITABLE FOR LAMPS, CONTROL GEAR BOX CABLING & TERMINATION OF ITEMS SUPPLIED (TO BE MOUNTED ON 9 MTR POLE - ITEM CODE NO. E24).	NOS.	7.00	29.76		
84	E24	SUPPLYING AND ERECTING **STEEL TUBULAR SWAGED POLES, 9 MTR** LONG MADE OF SHEET STEEL HAVING ULTIMATE TENSILE STRENGTH 42 KG F/SQ.MM CONFIRMING TO BIS :2713 (RPART-II) COMPLETE WITH 300X300X6 MM THICK M. S. BASE PLATE FOR WELDING AT SITE AND SIZE AS PER CONFIGURATION GIVEN IN BIS FOR 410 SP-28 (113 KG- POLE WEIGHT) WITH 1.5 MTR. DEEP EXACAVATION, CONCRETING IN 1:4:8 RATIO SIZE 45 CMS X 45 CMS X 150 CMS AND POLE PLINTH IN 1:3:6 CEMENT CONCRETING HAVING 300 MM HEIGHT AND 300 MM DIA .INCLUDING DOUBLE EARTHING OF POLE WITH SUITABLE ARRANGEMENT, DULY PAINTED WITH TWO COATS OF RED OXIDE PAINT AND ONE COAT OF ALUMINIUM PAINT TO BE APPLIED AFTER ERECTION; THE LENGTH OF POLE BELOW GROUND TO BE PAINTED WITH TWO COATS OF BLACK BITUMINUS PAINT. THE POLE SHALL BE COMPLETE WITH JB, FUSE AND MINOR FABRICATION AS BELOW : **I)** DRILING 20 MM DIA HOLE AT ABOUT 2.5 MTR FROM GROUND LEVEL FOR WIRE LEADS FROM JUNCTION BOX TO LIGHT FIXTURE . **II)** DRILING 15MM DIA HOLES AT ABOUT 0.7 AND AT 2.5 MTR FROOM GROUND LEVEL AND WELDING 12 MM NUTS FOR USING A 12 MM G.I BOLT FOR FASTENING EARTH CONDUCTERS. **III)** WELDING REQUIORED HOLES FOR FIXING POLE CAP OF STREET LIGHT BRACKET. **IV)** WELDING DIAMETRALLY 10 MM M.S. ROUND 30 MM BELOW POLE TOP EDGE FOR CLIPPING WIRE LEADS .	NOS.	10.00	71.58		
85	E25	PROVIDING **EARTHING PITS WITH** 2 " DIA , 2 M LONG GI PIPES WITH FLANGE & GI WIRES WITH CHARCOAL, SALT AND AS PER THE STANDARD PRACTICE FOR ELECTRICAL CONNECTION.RATE SHALL BE INCLUSIVE OF ALL MATERIALS, LABOURS, ETC COMPLETE.	NO	4.00	8.19		
86	E26	SUPPLY AND FIXING **ALUMINIUM DISPERSIVE LUMINAIRE** ENAMELED GREEN AND WHITE WITH CAST ALUMINIUM FLANGE AND NIPPLE SUITABLE FOR USE WITH GLS LAMP, DOME 12" DIAMETER, WITH HANGING BRACKET AND **200W GLS LAMP** OF CROMPTON OR EQUIVALENT **BAJAJ/PHILIPS** MAKE, COMPLETE.	Nos.	63.00	9.12		
87	E27	**WIRING WITH 2.5 SQ MM** ISI MARK COPPER WIRE FOR ABOVE IN PVC CONDUIT ALONG WITH GI EARTH WIRE INCLUSIVE OF ALL MATERIAL, LABOUR ETC. COMPLETE	Per Point	67.00	7.42		
88	E28	SUPPLY OF CABLES 3 -1/2 CORE X 185 SQMM ALUMINIUM ARMOURED PVC INSULATED CABLE (THREE AND HALF CORE) CONFIRMING TO IS 1554 (PART -I)	RM	90.00	0.98		

SL.NO	ITEM CODE	DESCRIPTION OF WORK	UNIT	QUANTITY	Factor (F)	Rate (A X F) / 100000	Amount
89	E29	INSTALLATION OF **CABLES 3 -1/2 COREX 185 SQMM ALUMINIUM ARMOURED** PVC INSULATED CABLE CONFIRMING TO IS 1554 (PART -I) INCLUDING LAYING OF CABLE BELOW GROUND , EXCAVATION OF TRENCH OF 600 MM DEPTH IN ALL KIND OF SOIL, TERMINATION OF CABLES CORES WITH CRIMP TYPE LUGGS, PROVIDING SAND LAYER BELOW/ ABOVE THE CABLE, BRICK LAYING BOTH SIDE /ABOVE THE ABOVE THE CABLE AND BACK FILLING ETC. CABLES ARE TO BE LAID FROM TRANSFORMER SUB STATION TO 415 VOLT AC DISTRIBUTION BOARD.	RM	90.00	1.29		
90	E30	SUPPLY OF CABLES 3 -1/2 CORE X 95 SQMM ALUMINIUM ARMOURED PVC INSULATED CABLE (THREE AND HALF CORE) CONFIRMING TO IS 1554 (PART -I)	RM	72.00	23.89		
91	E31	INSTALLATION OF **CABLES 3 -1/2 CORE X 95 SQMM ALUMINIUM ARMOURED** PVC INSULATED CABLE CONFIRMING TO IS 1554 (PART -I) INCLUDING LAYING OF CABLE BELOW GROUND, EXCAVATION OF TRENCH OF 600 MM DEPTH IN ALL KIND OF SOIL, TERMINATION OF CABLES CORES WITH CRIMP TYPE LUGGS, PROVIDING SAND LAYER BELOW/ ABOVE THE CABLE, BRICK LAYING BOTH SIDE /ABOVE THE ABOVE THE CABLE AND BACK FILLING ETC COMPLETE. CABLES ARE TO BE LAID FROM 415 VOLT AC DISTRIBUTION BOARD TO	RM	72.00	1.25		
92	E32	SUPPLY OF CABLES 3 -1/2 COREX 35 SQMM ALUMINIUM ARMOURED PVC INSULATED CABLE (THREE AND HALF CORE) CONFIRMING TO IS 1554 (PART -I)	RM	108.00	0.84		
93	E33	INSTALLATION OF **CABLES 3 -1/2 COREX 35 SQMM ALUMINIUM** ARMOURED PVC INSULATED CABLE CONFIRMING TO IS 1554 (PART -I) INCLUDING LAYING OF CABLE BELOW GROUND , EXCAVATION OF TRENCH OF 600 MM DEPTH IN ALL KIND OF SOIL, TERMINATION OF CABLES CORES WITH CRIMP TYPE LUGGS, PROVIDING SAND LAYER BELOW/ ABOVE THE CABLE, BRICK LAYING BOTH SIDE /ABOVE THE ABOVE THE CABLE AND BACK FILLING ETC.	RM	108.00	1.20		
94	E34	SUPPLY OF CABLES 2 CORE X 10 SQMM ALUMINIUM ARMOURED PVC INSULATED CABLE CONFIRMING TO IS 1554 (PART -I)	RM	180.00	0.54		
95	E35	INSTALLATION OF **CABLES 2 CORE X 10 SQMM ALUMINIUM ARMOURED** PVC INSULATED CABLE CONFIRMING TO IS 1554 (PART -I) INCLUDING LAYING OF CABLE BELOW GROUND , EXCAVATION OF TRENCH OF 600 MM DEPTH IN ALL KIND OF SOIL, TERMINATION OF CABLES CORES WITH CRIMP TYPE LUGGS, PROVIDING SAND LAYER BELOW/ ABOVE THE CABLE, BRICK LAYING BOTH SIDE /ABOVE THE ABOVE THE CABLE AND BACK FILLING ETC COMPLETE. CABLES ARE TO BE LAID FROM 415 VOLT AC POWER FEEDER PILLAR BOARD TO LIGHTING POLES & POLE TO POLE.	RM	180.00	1.20		
		TOTAL VALUE OF SECTION- B IN Rs.					
		TOTAL VALUE OF SECTION A + SECTION- B IN Rs.					
		GROSS TOTAL					

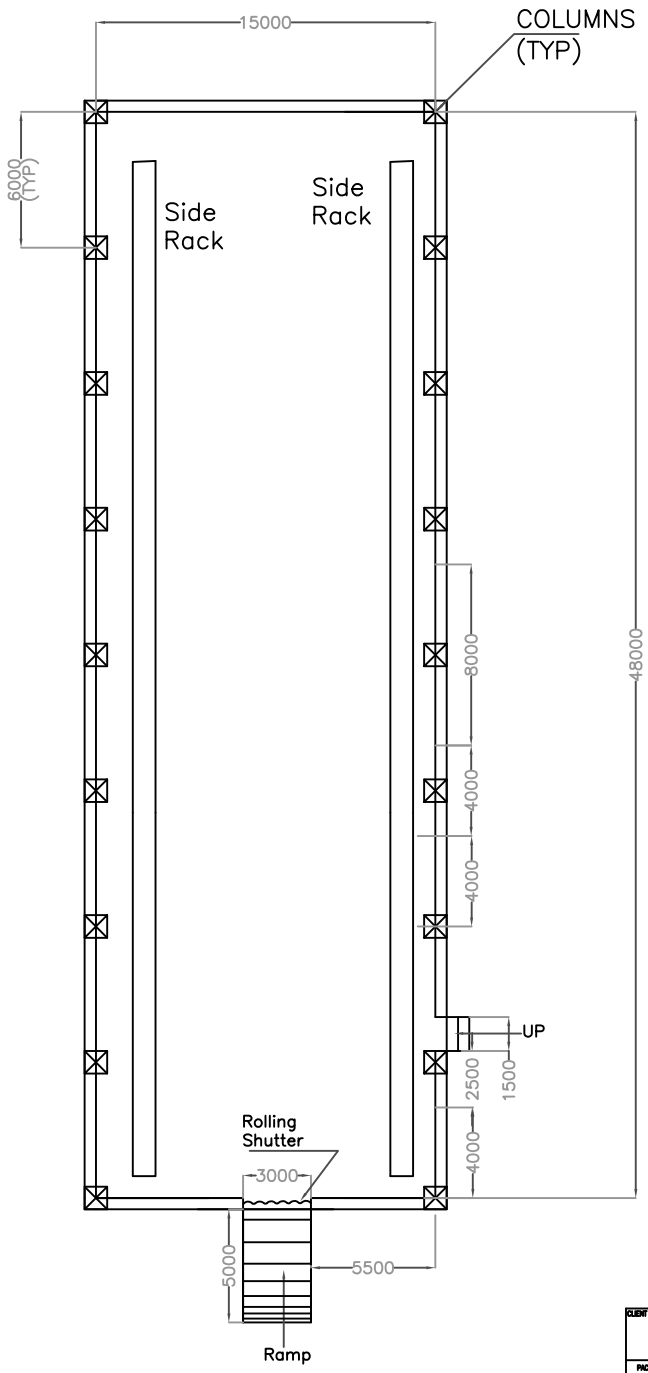


PLAN OF CLOSED SHED
(WITH OFFICE)

CLIENT	NUCLEAR POWER CORPORATIOON OF INDIA
PACKAGE	CCIP
PROJECT	2X700MW RAPP, KOTA
	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR NORTHERN REGION NOIDA (U.P.)
DEPT CODE	C

	NAME	SIGN	DATE
DRN	MAYANK		15.09.2014
DESN	MAYANK		15.09.2014
CHD	MAYANK		15.09.2014
APPD	MAYANK		15.09.2014

TITLE	PLAN OF CLOSED SHED (WITH OFFICE)
DEPT.	
SIGN	
DATE	
SCALE	NTS
SHEET	1 OF 1
REV.	0



PLAN OF CLOSED SHED

Closed shed without office

CLIENT	NUCLEAR POWER CORPORATIOON OF INDIA
PACKAGE	CCIP
PROJECT	2X700MW RAPP, KOTA
	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR NORTHERN REGION NOIDA (U.P.)
TITLE	PLAN OF CLOSED SHED
DEPT.	SCALE NTS
SIGN	
DATE	
SHEET 1 OF 1	REV. 0

TECHNICAL SPECIFICATIONS FOR BLASTING:-

REFERENCES

- Explosive Rule 2008
- Explosive Act 1884
- IS 4081
- BHEL Specification No.- PE-TS-392-600-001, Sec- D, Vol- IIB

PRE- REQUISITE:

1. Approved Work Procedure / Blasting Procedure.
2. Excavation Work Permit
3. Blasting Work Permit
4. Certificate of Qualified and Licensed blaster.

TERMINOLOGY IN BLASTING

- **Blaster: -** The person assigned the duty of loading and blasting the explosives.
- **Blasting Cap** - A shell closed at one end and containing a charge of detonating compound, which is ignited from a spark. It is used for detonating explosives.
- **Detonator** - Any device containing a detonating charge that is used for initiating detonation in an explosive. The term includes, but is not limited to, electric blasting caps of instantaneous and delay type blasting caps for use with safety fuse and detonating cord delay connectors.
- **Electric Blasting Cap** - A shell containing a charge of detonating compound which is ignited by an electric current from two projecting insulated leg wires.
- **Explosive** - Any mixture or chemical compound which is capable of producing an explosion by its own energy. This includes black powder, dynamite, nitroglycerine compounds, fulminate, or explosive substance having explosive power equal to or greater than black powder.
- **Magazine** - Any building or other structure used for the storage of explosives.
- **Missed Hole** - A drilled hole containing an explosive charge that failed to explode.
- **Permanent Blasting Wires** - Wires between the firing switches, for use in blasting where the power source is an electric circuit.
- **Primer** - An explosive cartridge with a detonator or igniting agent inserted therein.
- **Safety Fuse/Detonating Fuse** - A medium manufactured especially for firing explosive charges that conveys a flame at uniform rate rather than one that is in itself a detonator or one that operates on some other principle.
- **Stemming** - Material used for confining a charge of explosives in a hole or to cover explosives in mud capping.

BLASTING: -

A. **INITIATION & ROUTING OF WORK PERMIT FOR ROCK BLASTING**.

(i) BHEL Engineer and NPCIL Engineer shall initiate the blasting work permit by filling the blasting work permit format (as per Annexure-2). Contractor shall depute the one representative as a work permit holder for carrying out the rock blasting work. After ensuring the requirements as mentioned in work permit format, Contractor shall authorize the rock blasting work permit. After authorization of work permit, the permit format shall be forwarded to Safety Engineer for guidance regarding safety precautions to be taken while carrying out blasting work.

(ii) BHEL/ NPCIL Safety Engineer shall describe the safety precautions, which shall be taken care by Contractor before starting the work, during carrying out the work and after completion of the work. BHEL/ NPCIL Safety engineer shall forward the work permit to Contractor for ensuring the described precautions.

(iii) Contractor shall confirm / ensure the all precautions as described by Safety Engineer. After confirming / ensuring the said safety precautions & responsibilities, permit shall be forwarded to Safety Officer authorised by NPCIL.

B. **JOB HAZARDS ANALYSIS**:

Contractor Engineer shall ensure the completion of the Job Hazards analysis of the work prior to initiating the work permit. According to the outcome of job hazard analysis safety precautions / corrective actions shall be taken by Contractor Engineer and the same shall be mentioned in the work permit.

C. **ENTRY OF EXPLOSIVES**:

The number of explosives, detonators, safety fuses, arc chords etc brought from the magazine, shall be recorded at Safety Officer authorised by NPCIL. Commandant (Security) or available Security Officer shall depute a Security representative for witnessing the blasting

.

D. LOADING OF EXPLOSIVES :

The explosives shall be loaded in presence of the representatives of Contractor and Safety Officer authorised by NPCIL. Work permit holder shall ensure the shutdown of electrical installation (if required) before loading of the explosives.

E. **CARRY OUT THE BLASTING PROCESS**:

A licensed blaster should carry out the blasting process only after compliance of necessary safety precautions.

F. **POST- BLASTING ACTIVITIES**:

The number of unused explosives, detonators and safety fuses shall be recorded in the prescribed form (Annexure-1). All unused explosives, detonators and safety fuses shall be taken back to the magazine. The permit holder, & Security shall certify the safe completion of the blasting in the prescribed form (Annexure-1).

DUTIES & RESPONSIBILITY OF VARIOUS AGENCIES:

I. CONTRACTOR ENGINEER

Before authorizing the blasting work permit, the Engineer shall ensure the safety of man, material, public utilities System, if present in the vicinity of the blasting zone by taking appropriate steps. He shall ensure the implementations of job hazards analysis outcome. He shall also ensure that the blaster has got a valid license. He shall send Blasting Notice to all concerned agencies well in advance.

II. PERMIT HOLDER (REPRESENTATIVE OF CONTRACTOR):

The permit holder shall accompany the explosives from the magazine to the loading site. He shall ensure that all necessary precautions are taken during transportation, loading and blasting of explosives. He shall ensure that charging of explosive in holes shall be done in presence of Security representatives & him. Quantity of charge (explosive) per hole shall be as recommended in the work permit. He shall also ensure that shut down of any electrical installation, if so mentioned in the permit, is taken before loading of the explosives. After the blasting, he shall check for any misfired holes and if found, shall do necessary arrangements for exploding them. He shall also check for any damages caused to any electrical or public utility systems and then shall certify the completion of blasting process.

III. CONTRACTOR SAFETY ENGINEER

Safety Engineer shall inspect the blasting zone before forwarding the permit .He shall indicate the precautions to be taken for carrying out the rock blasting work.

IV. REPRESENTATIVE OF SAFETY SECTION:

The representative of Safety Section shall carry out the verification of the compliance of safety precautions, which are to be taken by the permit holder on sample basis as per the advice of Safety Engineer.

V. **REPRESENTATIVE OF SAFETY OFFICER AUTHORISED BY NPCIL**.

The representative of Safety officer shall check the amount of explosives, detonators, fuses, arc chords etc. brought from the magazine. He shall also ensure that all the unused explosives, detonators, fuses, arc chords etc are taken back to the magazine after completion of blasting and the same entries shall be made in records. Explosives shall be handled up to blasting site in explosive department certified van only. Charging of explosive in the holes shall be done in presence of Engineer & Security representatives. Blasting zone should be properly barricaded & RED flagged and restriction of entry of the Vehicles /Public/ animals etc. to blasting zone shall be ensured at all entry points by Safety Officer & work permit holder.

VI. ON DUTY ELECRICAL SUBSTATION OFFICER:

The On duty electrical substation Officer shall provide shut down of electrical system, as and when required, on request of the Contractor as per prevailing procedure. He shall energize the system again, only after clearance from the Contractor representative.

VII. RECORDS:

All records pertaining to the blasting shall be maintained by the Contractor and shall be produced for auditing as and when required.

PRECAUTIONS TO BE FOLLOWED:

1. **PRECAUTIONS AT MAGAZINE AND DURING TRANSPORTATION**:

The specification of the magazine should comply with latest provisions in Explosives Act/ Rules.
(a) Transportation should be done between sunrise & sunset.
(b) A Tarpaulin should suitably cover the packages containing the explosives.
(c) Red flags should be displayed on the vehicle authorized by explosive Dept.
(d) Explosive should be stored in such a manner that during transportation they should not move and should be protected against bumping and friction.

2. **PRECAUTION DURING LOADING OF EXPLOSIVES**:

Permit holder shall follow the precautions as stipulated in the explosive Act / Rules.

- Explosives should be thoroughly checked before loading.
- Drilling of the holes and loading of explosives should not be done simultaneously at the same blasting site.
- Detonator leads should be kept short circuited till all explosives are loaded and it should be opened only at the time of the connection.

- No work other than that associated with the loading operation shall be carried out within 10m of the holes.
- Loading should be avoided during thunderstorm, lightening and when stray current passes through the ground. Loading should also be avoided when high voltage line is passing above the blasting area.
- Use of synthetic clothes by the persons handling detonators and explosives should be avoided.
- Due care should be taken while pulling / untwisting the lead wires of the detonator and while doing so one hand should hold the terminals of wire coming out from detonator.
- Jerks, impacts and friction on detonator should be avoided. Detonator should not be pressed.
- Smoking should be completely prohibited within blasting zone. Fire fighting tools / material (Water, Sand & CO_2 Cylinder) shall be made available at the blasting site.
- After the completion of the loading, left over explosives, detonators and fuses must be immediately removed from blasting area.
- Care should be taken to ensure that fuses or wires connected to detonators are not damaged during the loading.
- If muffled blasting is being carried out, the cover plates should be covered with gunny bags filled with fine sand.

Blasting Procedure:

- Valid License holder blasting foreman/ blaster shall be engaged for executing blasting. Prior to any operation, permission for blasting shall be taken from NPCIL.
- Blasting permits duly signed by above shall be submitted to Security department for their permission to take this explosive inside the plant site.
- It is proposed to carryout blasting operation in mutually agreed time between nearly 5.00 to 8.00 AM , 12.00 to 2.00PM and 5.00 to 7.00 PM.
- M/s NPCIL and M/s BHEL safety group shall be informed prior to loading and charging, it shall be done in presence of them. Authorized person of blasting must be ensured that nearly structure is safe.
- Detail of explosives, detonator, detonating fuse and card delay used shall be recorded and the unused explosives, detonators shall also be recorded after completing of all blasting activities.
- After loading operation, entire area shall be evacuated 15 minutes prior to blasting by blowing supervisor.
- Blasting operation should be carried out in presence of site engineer and authorized blasting supervisor.
- Vibration monitoring meter shall be installed for monitoring of vibration at the nearby location as per site requirements.
- Communication will be done through a notice to all agencies to proceed in safe manner.
- A blasting coordinator will be deputed for coordinating blasting work.

- Blasting Coordinator will have white, green and red flag with him along with a whistle.
- Blasting operator will have yellow and red colour flags along with a whistle.
- After loading the explosives by the agency, blasting coordinator will send the persons with red flag and whistle to restrict entry of vehicles/ persons at all entry points

STORAGE OF EXPLOSIVES

Storage of Explosives shall be carried out as per IS Code 4081

Annexure- 1

BLASTING COMPLETION CERTIFICATE

1. Date & time of blasting:
2. Location of blasting:
3. Name of Engineer
4. Name of blaster:
5. Name of Permit holder:
6. Name of the Contractor:
7. Detail of Explosives

Item Quantity brought in Quantity Used Balance

Item	**Qty brought In**	**Qty Brought Out**	**Balance**
Gelatin rods			
Detonators			
Safety fuse			
C/R			
D Fuse			
No. of holes Blasted			

(Strike out which ever inappropriate)

A. The blasting has been carried out as per our satisfaction. No damage has been caused to person or property.

B. The following deficiencies/damages were observed during/after blasting:

(i) ……..

(ii) ……..

(Name & Signature of Contractor representative) (Name & Signature of Safety representative (Name & Signature of M/s BHEL

Authorised by NPCIL

Annexure - II

BLASTING WORK PERMIT

Permit no. **Dated:**

1. Name of the Blaster:
2. License No. :
3. Place & location where blasting is to be carried out:
4. Time & Date when to be carried out:
5. No. of holes/amount of explosive:
6. Type of detonator to be used:
7. Type of blasting to be carried out: Open / Muffled
8. Name of permit holder (NPCIL), deputed by Contractor for blasting:
9. Job hazards analysis of the job carried out:
(Attached the report)
10. If any civil structures/public utility: system/ O.H.
Electric lines are present in the premises of blasting.
If so, give details. (If yes, clearance required):
11. Blasting Notification letter No & Date:
12. Name of the Company:

Signature
(Name & Desig. of contractor

Signature
Name & Desig. of Permit Holder

All Control measure has been taken as per the outcome of job hazards analysis. Precautionary measure has been taken for safety of electrical installations & public utilities systems presents in the vicinity of the blasting zone. Blaster has got a valid license. Blasting Notice sent and acknowdgement received from all concerned agencies / required authorities / local Police well in advance and work Permit is authorized.

Name & Desig. of BHEL Engineer

GOVERNMENT OF INDIA

AERB SAFETY GUIDE

SAFETY GUIDE FOR WORKS CONTRACT

ATOMIC ENERGY REGULATORY BOARD

SAFETY GUIDE

FOR

WORKS CONTRACTS

Government of India
Atomic Energy Regulatory Board
Bombay – 400 095

August 1991

I

C O N T E N T S

II

III

F O R E W O R D

Generally the number of accidents are more during construction phase of a Project. These accidents involve mostly contractor workers. A need for a single document in the form of a guide or a manual defining the work situations during construction phase and the required safety precautions/procedures/equipment to be taken/followed/used was recognized by DAE SRC. In its meeting No. 259 held on 5th February, 1986, a Committee with Shri K.S. Somayaji as the Convenor was constituted to look into the type of accidents occurring during construction phase and also to evolve a guide to contain safety precautions that are required to be taken in the construction activities.

This Sub-Committee's report was discussed by DAE SRC in its meeting No. 271 held on 18th June 1986 but unfortunately could not be finalized. On January 3, 1990, this document was circulated to all the units of DAE and also to members of SARCOP for their comments. Several units and members of SARCOP have given their comments and these comments were further reviewed by another Group in consultation with Shri K.S. Somayaji. This Group eventually finalized the guide in its present form taking note of the comments from all the agencies.

In this guide certain qualitative terms like adequate, minimum, near, suitable, good quality, sufficient, etc. have been used, since it is not possible to quantify them for the varied nature of jobs that are being handled at the construction sites. It is recommended that the Safety Engineer and the concerned Engineer In-Charge may be consulted for their better judgment on meeting the qualitative requirements.

IV

This guide was finally discussed at SARCOP Meeting No. 88 held on 22nd August, 1990 and was approved. Every unit of DAE and its Undertakings are required to use the document as a guide to be followed in the award of works contracts to the contractors for compliance with the safety precautions laid down. It is incumbent that this guide be included as part of the tender document for effective compliance.

SARCOP places on record its appreciation for the interest shown by various agencies and individuals in scrutinizing the draft and sending their comments. SARCOP also places on record its appreciation of the time and effort put in by the Committee and the Group to bring this guide in its final form.

(S.D. Soman)
Chairman, AERB

Bombay
August 1991

SAFETY GUIDE FOR WORKS CONTRACT

1. INTRODUCTION

Many of the works of Department of Atomic Energy at its various sites are executed by the contractors. During these works, contractors personnel are likely to be exposed to different types of hazards. Similarly, unsafe acts of contractors personnel may generate hazards for Departmental staff and/or workmen of other contractors working at the site. Such unsafe acts may also pose danger to the existing installations and even to members of public. This guide is prepared to facilitate safe working during execution of contract works. It is hoped that units of DAE may issue this guide as a part of contract documents while awarding contracts.

2. GENERAL SAFETY PROVISIONS

2.1 The Contractor shall take all safety precautions during the execution of awarded work and shall maintain and leave the site safe at all times. At the end of each working day and at all times when the work is temporarily suspended, he shall ensure that all materials, equipment and facilities will not, cause damage to existing property, personal injury or interfere with the other works of the Project or Station. The Contractor shall comply with all applicable provisions of the safety regulations, clean up programme and other measures that are in force at the site.

2.2 The Contractor shall provide and maintain all lights, guards, fencing, warning signs, caution boards and other safety measures and provide for vigilance as and where necessary or as required by the Engineer-in-charge or by any duly constituted authority for the protection of workers or for the safety of others. The caution boards shall also have appropriate symbols.

2.3 Adequate lighting facilities such as flood lights, hand lights and area lighting shall be provided by the Contractor at the site of work, storage area of materials and equipment and temporary access roads within his working area. The Contractor shall obtain written approval of the Engineer-in-charge to the lighting scheme and place of tapping prior to its installation.

2.4 The Contractor shall plan his operations so as to avoid interference with the other Departmental works, other Contractors or sub-Contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the Department for safe and smooth working.

2.5 The Contractor and his sub-contractor, if any shall comply with the instructions given by the Safety Engineer or his authorized nominee regarding safety precautions, protective measures, house keeping requirements, etc. The Safety Engineer with due intimation to Engineer-in-Charge shall have the right to stop the work of the Contractor, if in his opinion proceeding with the work will lead to an unsafe and dangerous condition. Engineer-In-Charge shall get the unsafe condition removed or provide protective equipment at the contractors cost. The contractor can employ his own Safety Engineer or nominate one of his officers for liaison with Departmental Safety Engineer for ensuring compliance of all safety rules. Contractor shall ensure that all his workmen are aware about the nature of risk involved in their work and have adequate training for carrying out their work safely.

2.6 The contractor shall be held responsible for non-compliance of any of the safety measures and delays, implications, injuries, fatalities and compensation arising out of such situations or incidents.

3. TRAFFIC

3.1 The Contractor shall conduct his operations so as to interfere as little as possible with the use of existing roads at or near locations where the work is being performed.

3.2 When interference to traffic is inevitable, notice of such interference shall be given to the Engineer-in-charge well in advance (atleast 48 hours) with the details of start of the work and time required, storage of materials, and details of the proposed methods of providing the required facilities for safe and continuous use of roads and obtain his clearance.

3.3 The Contractor shall, at his own expense, make such approved temporary provisions as are required to maintain atleast one lane of traffic by bridging the excavation, providing ramps over surface obstructions or providing suitable temporary bye-pass around the obstructions. The Contractor shall exercise full care to ensure that no damage is caused by him or his workmen, during the operation, to the existing water supply, sewerages, power or telecommunication lines or any other services or works. The Contractor shall be required to provide and erect before construction, substantial barricades, guard-rails, and warning signs. He shall furnish, place and maintain adequate warning lights, signals, etc., as required by Engineer-in-charge.

4. SAFE MEANS OF ACCESS

4.1 Adequate and safe means of access and exit shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevations shall not be permitted.

4.2 Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal and all ladders shall be maintained well for safe working condition. An extra mazdoor shall be engaged for holding the ladder if ladder is not securely fixed. If the ladder is used for carrying materials as well, suitable foot holds and hand holds shall be provided on the ladder. The ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical). Ladders shall not be used for climbing carrying materials in hands. While climbing both the hands shall be free.

4.3 Scaffolding or staging more than 3.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a standard guard rail properly attached, bolted, braced or otherwise secured at least 1.0 m high above the floor or platform of such scaffolding or staging. The guard rail shall extend along the entire exposed length of the scaffolding with only such opening as may be necessary for the delivery of materials. Standard railing shall have posts not more than 2 m apart and an intermediate rail halfway between the floor or platform of the scaffolding and the top rail. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure. Scaffolding and ladder shall conform to relevant IS specification (IS 3696-1966). Timber/Bamboo scaffolding shall not be used.

4.4 Working platforms of scaffolds shall have toe boards atleast 15 cm in height to prevent materials from falling down.

4.5 A sketch of the scaffolding proposed to be used shall be prepared and approval of the Engineer-in-charge obtained prior to start of erection of scaffolding. All scaffolds shall be examined by Engineer-In-Charge before use.

4.6 Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally and if the height of the platform or gangway or stairway is more than 3.5 m above ground level or floor level, they shall be closely boarded, shall have adequate width for easy

movement of persons and materials and shall be suitably guarded as described in 3.3 above.

4.7 The planks used for working platform shall not project beyond the end supports to a distance exceeding four times the thickness of the planks used. The planks shall be rigidly tied at both ends to prevent sliding and slippage. The thickness of the planks shall be adequate to take load of men and materials and shall not collapse.

4.8 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing, the minimum height of which shall be 1.0 m, along with 15 cm high sheet obstruction at floor level along the railing.

4.9 Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9 m in length. For ladders upto 3m in length the width between side rails in the ladder shall in no case be less than 300 mm. For longer ladders this width shall be increased by atleast 20 mm for each additional meter of length. Step spacing shall be uniform and shall not exceed 300 mm.

4.10 Adequate precautions shall be taken to prevent danger from electrical lines and equipment. No scaffolding, ladder, working platform, gangway runs, etc. shall exist within 3 meters of any uninsulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipments are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

5. EXCAVATION, TRENCHING AND EARTH REMOVAL

All trenches 1.2 m or more in depth shall at all times be supplied with at least one ladder for each spacing of 30 m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 m above the surface of the ground.

The sides of the trench which are 1.2 m or more in depth shall be stepped back to give suitable slope (angle of repose) or securely held by timber bracing, so as to avoid the danger of sides from collapsing. The excavated material shall not be placed within 1.5 m of the edges of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances mining or under-cutting shall be done.

The contractor shall ensure the stability and safety of the excavation, adjacent structures, services and the works.

Open excavations shall be fenced off by suitable railing and warning signals installed at night at well lit places so as to prevent slipping or falling into the excavations.

All blasting operations shall be carried out on the basis of procedures approved by Inspector of Explosives. All works in this connection shall be carried out as per IS Code of Practice. Barricades, Warning Signs etc. shall be placed on the roads/open area. Prior approval of such operation shall be obtained from Safety Engineer/Engineer-In-Charge of works.

a) For removal of earth from an earth mound a written permission shall be obtained from the Engineer-In-Charge of the work and the Engineer-In-Charge of the earth mound.

b) As far as practical, earth shall be removed mechanically.

c) Wherever manual removal of earth is involved, earth shall be removed from the top by maintaining the proper slope equal to the angle of re-pose of the earth.

d) Such work shall be constantly supervised by the contractor's responsible person and frequently inspected by the departmental representative to ensure that no under-cutting is done.

6. CONCRETING

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

7. DEMOLITION

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

(a) All roads and open area adjacent to the work site shall either be closed or suitably protected. Appropriate warning signs shall be displayed for cautioning approaching persons.

(b) Before demolition operations begin, the Contractor shall ensure that the power on all electric service lines is shut off and the lines cut or disconnected at or outside the demolition site. If it is necessary to

maintain electric power during demolition operation, the required service lines shall be adequately protected against damage. Persons handling heavy materials/equipments shall wear safety shoes.

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

(d) Entries to the demolition area shall be restricted to authorized persons only.

8. PERSONAL PROTECTIVE EQUIPMENT

All necessary personal protective equipment as considered necessary by the Engineer-In-Charge shall be kept available by contractor for the use of the persons employed on the site and maintained in a condition suitable for immediate use. Also the Contractor shall take adequate steps to ensure proper use of equipment by those concerned. The personal protective equipments are to be provided by the contractor.

(a) All persons employed at the construction site shall use safety helmets. For other types of works, persons working in that area shall also use safety helmets, if advised by Safety Engineer/Engineer-In-Charge.

(b) Workers employed on mixing asphaltic materials, cement and lime mortars shall use protective goggles, protective foot wear and hand gloves. Use of proper respirators shall be an advantage.

(c) Persons engaged in welding and gas cutting works shall use suitable welding face shields. The persons who assist the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.

(d) Stone breakers shall use protective goggles. They shall be seated at sufficiently safe intervals of distance.

(e) Persons engaged in or assisting in shot blasting operations and cleaning the blasting chamber shall use suitable gauntlets, overalls, dust-proof goggles, boots and protective hood supplied with fresh air at the minimum rate of 9 m^3 /hr.

(f) All persons working at heights more than 4.5 m above ground or floor and exposed to risk of falling down shall use safety belts, unless otherwise protected by cages, guard railings, etc. In places where the use of safety belts is impractical, suitable net of

adequate strength fastened to substantial supports shall be employed.

(g) All powered two-wheeler motorcycle and scooter drivers an their pillion riders shall wear crash helmets inside the Project/Plant sites.

(h) When workers are employed in sewers and inside manholes which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated atleast for an hour. After it has been well-ventilated, the atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the register before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

9. PAINTING

9.1 The Contractor shall not employ women on the work of painting with products containing lead in any form. Only men above the age of 18 years shall be employed on the work with lead paint. The following precautions shall be taken during the work.

* Supplied air respirators shall be provided for use by the workers when paint is applied in the form of spray, or a surface having lead paint is dry rubbed or scraped.

* Overalls shall be supplied by the Contractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.

* All painting jobs, especially those in which lead paints are used shall be kept under industrial hygiene surveillance.

9.2 Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national/regional language, “SMOKING – STRICTLY PROHIBITED” shall be displayed in the vicinity where painting is in progress or where paints are stored. Symbols shall also be used for caution boards.

Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.

When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. If adequate ventilation cannot be provided, workers shall wear suitable respirators.

9.3 Epoxy resins and their formulations used for painting shall not be allowed to come in contact with the skin. The workers shall use plastic gloves and/or suitable barrier creams.

Adequate ventilation shall be provided especially when working with hot resin mixes.

Increased personal hygiene shall be practiced to control inadvertent contact with the resin and eliminate its effects.

Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.

10. LIFTING MACHINES AND TACKLES

10.1 Use of lifting machines and tackles including their attachments, anchorage and supports shall conform to the following standards or conditions.

(a) Lifting machines and tackles shall be of good mechanical construction, sound material and adequate strength and free from any defects and shall be kept in good repair and in good working order.

Every rope used in hoisting or lowering materials or as a means of suspension shall be of good quality and adequate strength and free from any defect.

(b) Every crane operator or lifting appliance operator shall be properly qualified. No person under the age of 21 years shall be in charge of any hoisting machine or give signal to operator of such machines.

(c) In case of every lifting machine (and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or as means of suspension) the safe working load shall be ascertained and clearly marked. In case of a lifting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing. This shall be approved by the Safety Engineer.

(d) In case of departmental machines, the safe working load shall be notified by the Engineer-in-charge. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work and get it verified by the Engineer-in-charge, supported by a valid test certificate by the Competent Person.

(e) Thorough inspection and load testing of lifting machines and tackles shall be done by a competent person atleast once every 12 months and records of such inspection and testing shall be maintained.

10.2 Motors, gearing transmission, couplings, belts, chain drives and other moving parts of hoisting appliances shall be provided with adequate safeguards. Hoisting appliances shall be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced or lowered.

11. WELDING AND GAS CUTTING

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

11.2 Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.

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

11.4 Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is done in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on persons or flammable materials.

11.5 Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter glasses of appropriate shade shall be worn as face protection.

11.6 Adequate ventilation shall be provided while welding in confined space or while brazing, cutting or welding zinc, brass, bronze, galvanized or lead coated materials.

11.7 Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied, cleaned thoroughly and it is made certain that no flammable material is present.

11.8 Fire extinguisher shall be available near the location of welding operations. Fire Safety Permit shall be obtained for working at vulnerable areas and operating areas before flame cutting/welding is taken up.

11.9 For electric (Arc) welding the following additional safety precautions shall be taken :

i) When electrical welding is undertaken near pipe lines carrying flammables, such pipe lines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.

ii) Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.

iii) Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.

iv) The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that the cables are not damaged by movement of materials.

12. GRINDING

12.1. All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.

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

12.3. Goggles shall be used during grinding operation.

13. ELECTRICTY

Guidelines for providing temporary power supply at the site and general safety procedures for using electricity are given in the enclosed Annexure.

14. HOUSE KEEPING

14.1 The Contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment.

14.2 Welding and other electrical cables shall be so routed as to allow safe traffic by all concerned.

14.3 No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Engineer-in-charge may require the Contractor to remove any materials which are considered to be of danger or cause inconvenience to the public. If necessary, the Engineer-in-charge may cause them to be removed at the Contractor's cost.

14.4 At the completion of the work, the Contractor shall have removed from the work premises all scaffoldings, surplus materials, rubbish and all huts and sanitary arrangements used/installed for his workmen on the site.

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

15. FIRE SAFETY

All necessary precautions shall be taken to prevent outbreak of fires at the construction site. Adequate provisions shall be made to extinguish fires should they still break out.

(a) Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be the minimum required in order to avoid unnecessary accumulation of combustibles at site.

(b) Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.

(c) Fire extinguishers as approved by the Engineer-in-charge shall be located at the construction site at appropriate places.

(d) Adequate number of Contract workmen shall be given education and training in fire fighting and extinguishing methods.

16. SAFETY WORK PERMIT

16.1 In order to ensure safety of work for hazardous operation (such as entry into confined spaces, welding/cutting on equipment/pipes where explosion hazards is present, works on high voltage and main medium voltage lines, blasting etc.,) special Safety Work Permits (SWP) shall be raised. The SWP's shall also to be obtained for any other work as recommended by Safety Engineer.

16.2 The Contractor shall strictly ensure all the safety conditions and requirements stipulated in the Safety Work Permit. The decision of the Safety Engineer shall be final in this regard.

17. WORK IN RADIATION AREA

The Contractor shall follow the stipulated procedure regarding work in the radiation area and other works related with radiography.

18. WORK IN AND AROUND WATER BODIES

When the work is done near any place where there is risk of drowning, all necessary rescue equipment such as life buoys and life jackets shall be provided and kept ready for use and all necessary steps taken for prompt rescued of any person in danger and adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work. Persons who do not know swimming shall not be engaged alone for any work where risk of drowning exists. Sufficient number of life buoys or life jackets shall be provided.

19. MEDICAL FACILITIES

19.1 The Contractor shall arrange adequate facilities for medical aid and treatment for his staff and workers engaged on the work site including the first-aid facilities if they are not available at the Project Site.

19.2 First-aid appliances including sterilized dressing, cotton wool and antiseptic cream shall be made available at a readily accessible places at every work site. These shall be maintained in good order under the charge of a responsible person.

19.3 At large work places where hospital facilities are not available within easy reach of the works, first-aid posts shall be established and be manned by a trained compounder. An ambulance shall be available during the entire period of work for attending to injury cases.

20. SAFETY OFFICER/SAFETY COORDINATOR

The Contractor shall have a Safety Officer or a supervisor to be designated as a Safety Coordinator in order to specifically look into the implementation of different safety requirements of the contract work. The person thus designated will in general co-ordinate with the Engineer-in-charge on matters of safety and in particular ensure that the Safety Guide is complied with fully. His name shall be displayed on the Notice Board at a prominent place at the work site.

21. REPORTING OF ACCIDENT

21.1 All accidents leading to property damage and/or personnel injuries shall be reported to the Engineer-in-charge immediately who shall inform SARCOP to be followed up with detailed accident reports in prescribed form.

21.2 Contractor shall also submit a monthly statement of accidents to Engineer-in-charge by 4^{th} of every month showing details of accident, nature of injury including disability, days lost, treatment required etc., and the extent of property damage.

22. PUBLIC PROTECTION

The Contractor shall make all necessary provisions to protect the public. He shall be bound to bear the expenses for defence of every action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of any precaution required to be taken to protect the public. He shall pay any damage and cost which may be awarded in any such suit, action or proceedings to any such person, or the amount which may be fixed as a compromise by any such person.

23. OTHER STATUTORY PROVISIONS

Notwithstanding the above clauses from 1 to 21 there is nothing in these to exempt the Contractor from the provisions of any other Act or Rules in force in the Republic of India. In particular all operations involving the transport, handling, storage and use of explosives shall be as per the standing instructions and conform with the Indian Explosives Act, 1884 and The xplosives Rules, 1983. Handling, transport, storage and use of compressed gas cylinders and pressure vessels shall conform with the Gas Cylinder Rules 1981 and Static and Mobile Pressure Vessels (Unfired) Rules 1981. In addition, The Indian Electricity Act 1910 and Indian Electricity Rules 1956, the Atomic Energy Act, 1962, the Radiation Protection Rules 1971, Radiation Protection Manual of Nuclear Facilities

and the Atomic Energy (Factories) Rules 1988 and various rules and Act related to mining shall also be strictly complied with.

ANNEXURE

GUIDELINES AND GENERAL PROCEDURES FOR SUPPLY AND USE OF ELECTRICITY AT SITE

1. GENERAL

Following safety requirements shall be complied with before the Contractor uses the power supply.

1.1 The Contractor shall submit a list of licensed electrical staff to be posted at site.

1.2 It shall be the responsibility of the Contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-in-charge/Electrical Engineer.

a) Indian Electricity Act, 1910

b) Electricity (Supply) Act, 1948

c) Indian Electricity Rules, 1956

d) National Electric Code 1985

e) Other relevant rules of Local Bodies and Electricity Boards.

After installation of the electrical power wiring works by the contractor, form of completion certificate as per IS 732 (Form SGCW-1) shall be submitted by the contractor duly signed by the authorized valid licensed electrical contractor and/or supervisor along with one copy of the contractor's license and/or competency certificate of supervisor issued by the Electricity Board/Government Electricity Organization as per the enclosure.

The power supply shall be regulated as per the terms and conditions of the supply of the respective electricity boards.

1.3 (a) For purposes of electrical load and power planning by the electrical section, the contractor shall furnish along with the tender, the estimated load requirement of electric power for the execution of the contract works in terms of maximum Kilo Watt or KVA demand during various periods/months of the contract period along with the details of the construction electrical equipment/machinery with their individual load details and location/locations of power supply

required for availing temporary electric power supply in the standard proforma enclosed (Form SGCW-2).

(b) The electric power supply will be generally made available at one point in the works site of the contractor by the department.

(c) Where distribution boards are located at different places the Contractor shall submit schematic drawing indicating all details like size of wires, Over Head or cable feeders, earthing etc. The position and location of all equipment and switches shall be given.

1.4 The Contractor shall make his own arrangements for main earth electrode and tappings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant I.S. Specifications (IS-3043)

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

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

1.7 The Contractor shall not connect any additional load without prior permission of Departmental Electrical Engineer. For obtaining additional power required, test reports of the tests mentioned in (d) of Form SGCW-1 shall be submitted.

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

1.9 The entire installation shall be subjected to the following tests before energisation installation including portable equipment :

a) Insulation resistance test

b) Polarity test of switches

c) Earth continuity test

d) Earth electrode resistance

The test procedures and their results shall conform to relevant IS Specifications. The Contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.

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

2.1 Installation

a) Only persons having valid wireman's license/competency certificate shall be employed for carrying out electrical work and repair of electrical equipment, installation and maintenance at site. The job shall be supervised by a qualified licensed Supervisor.

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

c) Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards.

d) The minimum clearance to be maintained for all overhead lines along roads and across roads shall be as per the statutory requirements as listed in clause 1.2 of Annexure.

e) Grounding conductor of wiring system shall be of copper or other corrosion-resistant material. An extra grounding connection shall be made in appliances/equipment where chances of electric shock is high.

f) Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses be used in all circuits. For load of 5 KW or more earth leakage circuit breaker shall be provided in the circuits.

g) Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables/wires and earthed effectively. Metallic poles as a general rule, shall be avoided and if used shall be earthed individually. Anticlimbing guards and danger

notices shall be provided on poles. Each equipment shall have individual isolating switches.

h) Wires and cables shall be properly supported and an approved method of fixing shall be adopted. Loose hanging of wires & cables shall be avoided. Lighting and power circuits shall be kept distinct and separate.

i) Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.

j) All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid under ground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC) tile or any other approved means.

k) All armoured cables shall be properly terminated by using suitable cable glands. Multistranded conductor cables shall be connected by using cable lugs/sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.

l) All cable glands, armouring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.

m) All the Distribution Boars, Switch Fuse units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and water proof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible. Changes shall be done only after the approval of the Departmental Electrical Engineer.

n) The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all the switch board, equipment etc. against rain. Exposed live parts of all electrical circuits & equipment shall be enclosed permanently. Crane trolley wires and other conductors which cannot be completely insulated shall be placed such that they are inaccessible under normal working conditions.

o) Iron clad industrial type plug outlets are preferred for additional safety.

p) Open type Distribution Boards shall be placed only in dry and ventilated rooms; they shall not be placed in the vicinity of storage batteries or otherwise exposed to chemical fumes.

q) Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.

r) In front of distribution boards a clear space of 90 cm shall be maintained in order to have easy access during an emergency.

s) Adequate working space shall be provided around electrical equipment which require adjustment or examination during operation.

t) As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in work room where there is possibility of explosion hazards shall be explosion proof.

u) All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron frame work shall be used.

v) All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.

w) Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weather proof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.

x) The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakages.

Only 24 V supply system shall be used for hand lamps etc. while working inside metallic tanks or conducting vessels.

y) After installation of new electric system and or other extensive alterations to existing installations, thorough inspection shall be made by Departmental Electrical Engineer before the new system or new extension is put in use.

z) Contractor shall ensure that power factor for their loads shall be maintained at 0.85. In case the power factor falls below 0.85, necessary capacitor units shall be provided by the contractor.

2.2 Operation & Maintenance

a) All persons who work with electrical installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques.

b) The supervisor shall instruct the workers in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden ladders shall be used to reach the heights in electrical work.

c) No material or earth work shall be allowed to be dumped below or in the vicinity of the bare overhead line conductors.

d) Separate work permits shall be issued for individual group leaders working on the same system which shall be returned after the completion of the work to Safety Supervisor and no system shall be energized without the clearance of Safety Supervisor.

e) Before any maintenance work is commenced on electrical installations/equipment, the circuits shall be de-energized and ascertained to be dead by positive test with an approved voltage testing device. Switches shall be tagged or the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects viz.

i) That there shall be no danger from any adjacent live parts and

ii) That there shall be no chances of re-energisation of the equipments on which the persons are working.

f) While working on or near a circuit, whenever possible the use of one hand may be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.

g) When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not 'freeze' to the conductor.

h) Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet.

i) Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.

j) When two persons are working within reach of each other, they shall never work on different phases of the supply.

k) When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment/circuit.

l) It shall be ensured that the insulation and wire size of extension cords are adequate for the voltage and current to be carried.

m) While tapping electricity from the socket, plug top must be used. It shall be ensured that no extension boards are over loaded while tapping. Only standard three pin plugs shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with goods ones. Only joint free cables shall be used for connecting equipment/apparatus.

n) Floors shall be kept free from trailing electrical cables to avoid tripping hazard.

o) Power supply to all the machines and lighting fixture, shall be switched off when not in use.

p) Temporary electrical connections shall be removed as soon as the stipulated work is over. After completion of the works, the Contractor shall dismantle the distribution boards and the other facilities he may have erected.

q) Unauthorized tapping of power by others from distribution boards under the control of the contractor shall be prohibited at all circumstances.

r) No flammable materials shall be stored in any working area near the switch boards.

s) Safety work permits shall be used for switching off the main feeder and equipment by the contractor.

t) “MEN ON LINE” “DO NOT SWITCH ON” “DANGER” or “CAUTION” board as applicable shall be used during maintenance works on the electrical equipment.

2.3 Portable electrical equipment

a) Portable electrical equipment shall be regularly examined, tested and maintained to ensure that the equipment and its leads are in good order. Register shall be maintained for inspection recording the testing dates and results of the equipments.

b) All portable appliances shall be provided with three core cable and three pin plug. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.

c) All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wire in one length. No joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.

d) Flexible cables for portable lamps, tools, and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.

FORM NO. SGCW – 1

FORM FOR COMPLETION CERTIFICATE

(Prescribed under cl. 1.2 of Annexure)

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 1956 as well as IS:732-1963 code of practice for Electrical Wiring Installations. (System voltage not exceeding 650 Volts (Revised).

Electric installation at ……

Voltage and system of supply ……..

a)	Particulars of work	Number	Total load	Type of system of wiring
		---	---	---
	i) Light Points			
	ii) Fan points			
	iii) Plug points (3 pin)			
	iv) Motors			

b) If the work involves installation of overhead lines and/or underground cable _____

c) Earthing:

Description of earthing electrode, size of earth wire and number of electrodes provided:

d) Test results:

1. Insulation resistance for the whole installation:

   i) Between conductors
   ii) Between each conductor and earth

2. Resistance of earthing electrode or earthing system.
3. Maximum earthing resistance of installation

Signature of Supervisor
Name and address
of Supervisor.

Signature of Contractor
Name and address
of Contractor.

FORM NO. SGCW – 2

‘A’ APPLICATION FOR SERVICE CONNECTION BY CONTRACTOR

(Prescribed under cl. 1.3 of Annexure)
(to be filled in triplicate)

1. Name & Address of Contractor :

2. Reference to Tender & Work Order :

3. Completion period :

4. Connected load details (please attach details in a separate sheet) :

5. Max. demand anticipated :

6. Nature of service connection required (whether single or three phase) :

7. Place where service required :

   a) Works :

   b) Colony :

8. If supply of electricity is free or chargeable (please enclose extract of conditions from the tender) :

9. Details of meter provided :

   a) If meter required from the Department, whether SD is paid :

   b) Details of SD (Security Deposit) :

   c) Whether meter is tested or not, if tested, attach test report, if not, details of testing fee deposited :

10. Name of Supervisor/Electrician in charge of installation and maintenance :

11. Electrical license No. of person mentioned against col. 10 :

12. Electrical safety appliances available for use :

13. Fire extinguishers available for use :

14. First Aid facility/box available for use, if any. :

(Signature of the Contractor)

Date: Name:

‘B’ CERTIFICATE BY THE CONTRACTOR

Certified that my/our installations have been carried out in accordance with I.E. Rules and that I/We have employed competent persons to handle the installations.

I/we am/are agreeable to the bills, in respect of this service connections being raised on the basis the connected load furnished above, in case the actual consumption falls below the one stipulated by the tender conditions.

(Signature of the Contractor)

Name :

Address:

Date :

……

‘C’ CERTIFICATE BY THE CONTRACT CONTROL ENGINEER

Verified the particulars and forwarded to the Engineer-in-charge.

(Signature of Contract control Engineer)

Name:

Section: Civil/Electrical/Mechanical.

……

‘D’ CERTIFICATE BY THE ENGINEER IN CHARGE

Certified that the particulars furnished by the Contractor are true to the best of my knowledge and belief and that I have satisfied myself as to the safe conditions of electrical installations for which the service connection is applied for.

Signature :

Name:

Date: Designation with section:

‘E’ CERTIFICATE BY THE SAFETY ENGINEER

Certified that I have inspected the electrical installations referred herein and after satisfying myself about the safe conditions of the installation, I hereby recommend that the service connection be given to the Contractor.

Signature of Safety Engineer.

Name:

Date:

……

‘F’ AUTHORIZATION BY THE ELECTRICAL ENGINEER

Service connection may be/may not be given for the reasons noted hereunder.

Signature of Electrical Engineer.

Name:

Date: Designation:

‘G’ “REPORT OF COMPLIANCE”

Service connection is given by me on

a) Meter Nos. 1.

2.

3.

b) Initial readings: 1.

2.

3.

c) Locations: 1.

2.

3.

d) Meter sealings

Signature of Electrical Engineer
(Metering and Billing)

Name:

Date: Designation:

Note:

1st copy to Contract Control Engineer
2nd copy to Safety Engineer
and 3rd copy to Electrical Engineer

) After all the formalities are completed and Report of Compliance in (G) are filled up by the Electrical Engineer after power supply is given.

IMPORTANT RULES OF ATOMIC ENERGY

(FACTORIES) RULES, 1996

APPLICABLE TO

ENGINEERING, PROCUREMENT
&
CONSTRUCTION CONTRACTS

CHAPTER III

HEALTH

8. RECORD OF WHITEWASHING, ETC.- The record of dates on which whitewashing, colourwashing, varnishing, etc. are carried out shall be entered in a register maintained in a manner specified in Form 2.

9. CLEANLINESS OF WALLS, CEILINGS AND COMPOUND AREA.-

(1) Clause (d) of sub-section (1) of section 11 of the Act shall not apply to the class or description of factories or parts of factories specified in the Table to this rule and subject to the condition that they are kept in a clean state by washing, sweeping, brushing, dusting, vacuum cleaning or other effective and adequate means:

Provided the said clause shall continue to apply-

(a) as respects units/factories or parts of units/factories specified in part A of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 14.0 m^3

(b) as respects factories or parts of factories specified in part B of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 70.0 m^3 ;

(c) to engine-houses, fitting shops, lunchrooms, canteens, shelters, creches, cloakrooms, rest-rooms and wash places; and

(d) to such parts of walls, sides and tops of passages and staircases as are less than 6 m. above the floor or stair.

(2) If it appears to the Competent Authority that any part of a factory, to which by virtue of sub-rule (1) any of the provisions of the said clause (d) do not apply or apply as modified by sub-rule (1), is not being kept in a clean state, it may, by written notice, require the occupier to whitewash or colourwash, wash, paint or varnish the same, and in the event of the occupier failing to comply with such requisition within two months from the date of the notice, sub-rule (1) shall cease to apply to such part of a factory, unless the Competent Authority otherwise determines.

(3) The compound surrounding every factory shall be maintained in a sanitary and clean condition free of rubbish, filth or debris.

TABLE

Part A

1. Chemical works.

2. The following parts of units/factories:-

   (a) Rooms used only for storage of articles.

   (b) Rooms in which the walls or ceilings consist of galvanised iron and/or asbestos cement sheets.

   (c) Rooms in which graphite articles are manufactured / processed

   (d) Parts of walls, partitions, ceilings or tops of rooms which are at least 6 m. above the floor.

Part B

1. Electric generating or transforming stations.

2. Engineering works.

3. Foundries other than foundries in which brass casting is carried on.

10. DISPOSAL OF WASTES AND EFFLUENTS.- The arrangements made in every factory after the treatment of wastes and effluents due to the manufacturing processes carried on therein shall be in accordance with those approved by the relevant Water and Air pollution Boards appointed under Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environmental Protection Act, 1986 and such other authorities as may be notified by the Central Government in this behalf.

11. ILLUMINATION, TEMPERATURE AND VENTILATION.-

(1) Illumination.-

   (a) General : Adequate lighting is necessary for all buildings and in the open area so as to-

      (i) promote work and other activities carried out in the area;

      (ii) promote safety of the people; and

      (iii) create a pleasing environment conducive for feeling of well-being.

   (b) Adequate lighting will be achieved by,-

(i) planning of brightness in relation to task itself, immediate background of the task and the general surrounding;

(ii) avoiding glare produced by excessive contrast or abrupt and large change in brightness; and

(iii) planning of lighting for movement about a building and around.

(c) The recommended values of illumination for different locations is given in the Table below:

TABLE

Sr.No.	Visual Tasks			Illumination (Lux)
1.	Industrial Buildings & Process			
	(a)	General Factory Areas -canteens, cloakrooms, entrances corridors, stairs		100-150
	(b)	Factory- outside Areas -Stockyards, main entrances		20
	(c)	Assembly, Inspection, Wood working, Welding & Soldering, Machine & Fitting Shops,		
		(i)	Rough Work - Frame assembly	150
		(ii)	Medium Work - Assembly of parts	300
		(iii)	Fine Work - Electronic assembly, inspection	700
		(iv)	Very Fine Work - Assembly of precision parts, optical aids to be provided.	1500
		(v)	Very Precise Work	3000
	(d)	Boiler Houses		
		(i)	Coal & ash handling	100
		(ii)	Boiler rooms-operating area	100
		(iii)	Boiler rooms- other areas	20-50
		(iv)	Outdoor plants	150

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(e)	Chemical Works			
	(i)	Hand furnace, boiling tanks, driers, evaporators etc.		150
	(ii)	Controls, gauges, valves etc. (Supplementary lighting for viewing)		100
	(iii)	Control rooms		200-300
(f)	Electricity Generating Station (indoor)			
	(i)	Turbine halls		200
	(ii)	Auxiliary equipment areas	100	
	(iii)	Boiler houses		70-100
	(iv)	Boiler house & Turbine house		100
	(v)	Basement areas		70
	(vi)	Conveyer areas		70-100
	(vii)	Control rooms		200-300
	(viii)	Nuclear reactors & steam generating plants		150-200
	(g)	Engraving		1000
	(h)	Foundries		
		(i) Charging floors, tumbling etc.		150
		(ii) Fine moulding, core making & inspection		300
		(iii) Repairs		300
	(i)	Garages		
		(i) Parking areas		70
		(ii) Washing, polishing etc.		150
		(iii) Repairs		300
	(j)	Gauge & Tool room (Supplementary lighting if required)		700

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(k)	Laboratories & Test Rooms			
	(i)	General Labs & balance rooms		300
	(ii)	Electronic & Instrument Labs		450
(l)	Laundries, Dry cleaning & ironing		200-300	
(m)	Paint Shops & Spraying Booths			
	(i)	Dipping, rubbing	150-300	
	(ii)	Fine painting & retouching		450-700
(n)	Plating Shops			
	(i)	Vat & baths		150
	(ii)	Final buffing & polishing		Special lighting
(o)	Structural Steel Fabrication Plants			
	(i)	General		150
	(ii)	Marking off		300
(p)	Libraries			
	(i)	Shelves		70-150
	(ii)	Reading rooms		150-700
	(iii)	Cataloguing, sorting		150-300
	(iv)	Book binding etc.		300-700
(q)	Offices			
	(i)	Entrance & Reception		150
	(ii)	Conference rooms & Gen. office		30
	(iii)	Drawing offices		300-450
	(iv)	Corridors & Lifts		70
	(v)	Stairs, Lift landing		100-150
	(vi)	Telephone exchanges		150-200

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(r)	Hospitals		
	(i)	General & Wards	150
	(ii)	Operating Theatres General	300
	(iii)	Operation table	Special lighting
	(iv)	Laboratories	300
	(v)	Radiological rooms	100
	(vi)	Other areas	100-300
(s)	Restaurants		
	(i)	Dining room tables	100
	(ii)	Self service counters	300
	(iii)	Kitchen	200
	(iv)	Cloak room & toilets	100

(2) Temperature.- It is essential to provide such temperature in work environment so that workers can be exposed to it repeatedly without adverse health effects. The nature of work can be light , moderate or heavy and the corresponding heat loads for the type of work are 200, 200-350 & 350-500 K Cal/hr. The heat stress is measured in terms of Wet Bulb Globe Temperature (WBGT) Index.* (* Note - on page 12)

The permissible WBGT index in degrees Celsius is given in the following WBGT Table.

WBGT TABLE

	Work Load		
Work-Rest Regimen in each hour	Light	Moderate	Heavy
Continuous Work	30.0	26.7	25.0
75% Work - 25% Rest	30.6	28.0	25.9
50% Work - 50% Rest	31.4	29.4	27.9
25% Work - 75% Rest	32.2	31.1	30.0

The Competent Authority shall specify the optimum working temperature & humidity and also the rest periods for specific factories & jobs.

Rule 11(Tab.)

(3) Ventilation.- Ventilation shall be provided in buildings to supply fresh air for respiration & to dilute inside air to prevent vitiation by body odours & to remove any other products of combustion or other air contaminants. Contaminants from concentrated sources such as smoke, heat & fumes shall be collected separately by local exhaust ventilation. The recommended air changes per hour for various areas is given in the Table below:

TABLE

Area	**Air Changes/hour**
Factories	3 - 6
Dining Hall	12 - 15
Garages	12 - 15
Kitchen	6 - 9
Laboratories	3 - 6
Offices	3 - 6
Bathrooms & Toilets	6 - 12

Provided that the competent authority may relax the requirements regarding the number of air changes if it is satisfied that having regard to the location of the factory, orientation of the workroom, prevailing winds, roof height and the nature of manufacturing process carried on, sufficient supply of fresh air into the workroom is afforded during most part of the working time:

Provided further that in the regions where in summer (15th March-15th July) dry-bulb temperatures of outside air in the shade during most part of the day exceed 35 degrees Celsius and simultaneous wet-bulb temperatures are 25 degrees Celsius or below and in the opinion of the Inspector the manufacturing process carried on in the workroom of a factory permits thermal environments with relative humidity of 50% or more, the Inspector may serve on the manager of the factory an order to have sufficient supply of outside air for ventilation cooled by

* (a) Outdoors with Solar load

WBGT = 0.7NWB + 0.2GT + 0.1DB

(b) Indoor or Outdoor without Solar load

WBGT = 0.7 NWB + 0.3GT

Where NWB = Natural Wet Bulb Temperature

DB = Dry Bulb Temperature

GT = Globe Thermometer Temperature

passing it through water sprays either by means of unit type of evaporative air coolers(desert coolers) or, where supply of outside air is provided by mechanical means through ducts in a plenum system, by means of central air washing plants.

12. QUANTITY OF DRINKING WATER.- The quantity of drinking water to be provided per day for the workers in every factory shall be at least 5 litres per worker employed in the factory and such drinking water shall be readily available at all times during working hours.

13. SOURCE OF SUPPLY.- The water provided for drinking shall be supplied,-

(a) from the public water supply system, or

(b) from any other source approved in writing by the local Health Officer concerned.

14. MEANS OF SUPPLY.- If drinking water is not supplied directly from taps either connected with public water supply system or any other water supply system of the factory approved by the local Health Officer concerned, it shall be kept in suitable vessels, receptacles or tanks fitted with taps and having dust proof covers, and placed on raised stands or platforms in shade and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water renewed at least once every day. All practicable measures shall be taken to ensure that the water is free from contamination.

15. CLEANLINESS OF WELL OR RESERVOIR.-

(1) Drinking water shall not be supplied from any open well or reservoir unless it is so constructed, situated, protected and maintained as to be free from the possibility of pollution by chemical, or bacterial and extraneous impurities.

(2) Where drinking water is supplied from such a well or reservoir, the water in it shall be sterilised once a week or more frequently if the inspector by written order so requires, and the date on which sterilising is carried out shall be recorded:

Provided that this requirement shall not apply to any such well or reservoir if the water therein is filtered and treated to the satisfaction of the local Health Officer concerned before it is supplied for consumption.

16. REPORT FROM LOCAL HEALTH OFFICER CONCERNED.- The Inspector may by order in writing direct the manager to obtain, at such time or at such intervals as he may direct, a report from the local Health Officer concerned as to the fitness for human

consumption of the water supplied to the workers, and to submit to the Inspector a copy of such report as soon as it is received from the local Health Officer.

17. COOLING OF WATER.- In every factory wherein more than two hundred and fifty workers are ordinarily employed,-

(1) The drinking water supplied to the workers shall be cooled by an effective method for the period specified by the Inspector;

(2) The cool drinking water shall be supplied in every canteen, lunchroom and rest-room and also at conveniently situated points throughout the factory which for the purpose of the rules shall be called "water centres";

(3) The water centres shall be sheltered from the weather and adequately drained and shall be located outside the work-places where toxic materials are handled or processed;

(4) The number of water centres to be provided shall be one "centre" for every 150 persons employed at any one time in the factory:

Provided that in the case of a factory where the number of persons employed exceeds 500 it shall be sufficient if there is one such "centre" as aforesaid for every 150 persons up to the first 500 and one for every 500 persons thereafter:

Provided further that its distance between the place of work shall be such as may be specified by the Inspector.

(5) Every water centre shall be maintained in a clean and orderly condition; and

(6) The means of supply of cooled drinking water shall be either directly through taps connected to water coolers or any other system for cooling of water, or by means of vessels, receptacles or tanks fitted with taps and having dust proof covers and placed on raised stands or platforms in shade, and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water refilled at least once every day.

18. LATRINE ACCOMMODATION.- Latrine accommodation shall be provided in every factory on the following scale, namely:-

(a) where females are employed, there shall be at least one latrine for every 25 females;

(b) where males are employed, there shall be at least one latrine for every 25 males;

Provided that where the number of males exceeds 100, it shall be sufficient if there is one latrine for every 25 males up to the first 100 males, and one for every 50 males thereafter.

Note:- In calculating the number of latrines required under this rule, any odd number of workers less than 25, or 50 as the case may be, shall be reckoned as 25 or 50.

19. **TOILET BLOCKS .**- The toilet block shall consist of wash basins, latrines and urinals (in case of male workers). The number of wash basins will the same as number of latrines. Each wash basin shall be provided with mirror and liquid/cake soap. Each toilet block shall be provided with clean towel or electric hand drier. The number, size and location of the toilet block shall be as per the decision of Inspector & Public Health Authority.

20. **PRIVACY OF TOILET.**- Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings, which shall be maintained in good working order at all time.

21. **SIGN BOARDS TO BE DISPLAYED**.- Where workers of both sexes are employed, there shall be displayed outside each latrine block a notice "For Men Only" or "For Women Only" as the case may be, in the language understood by the majority of the workers. The notice shall also bear the figures of a man or of a woman as the case may be.

22. **URINAL ACCOMMODATION.**- Urinal accommodation shall be provided for the use of male workers and there shall be at least one urinal for every 50 males:

Provided that where the number of males employed exceeds 500, it shall be sufficient if there is one urinal for every 50 males up to the first 500 employed, and one for every 100 thereafter.

Note:- In calculating the urinal accommodation required under this rule any odd number of workers less than 50, or 100, as the case may be, shall be reckoned as 50 or 100.

23. **URINALS TO CONFORM TO PUBLIC HEALTH REQUIREMENTS.**- Urinals other than those connected with an efficient water-borne sewage system, and urinals in a factory wherein more than two hundred and fifty workers are ordinarily employed shall comply with the requirements of the Public Health Authorities.

24. **CERTAIN LATRINES AND URINALS TO BE CONNECTED TO SEWERAGE SYSTEM.**- When any general system of underground sewerage with an assured water supply for any particular locality is provided in a municipality, all latrines and urinals of a factory situated in

such locality shall, if the factory is situated within 30 metres of an existing sewer, be connected with that sewerage system suitably.

25. WHITEWASHING, COLOURWASHING OF LATRINES AND URINALS.- The walls, ceilings and partitions of every latrine and urinal shall be whitewashed or colourwashed and the whitewashing or colourwashing shall be repeated at least once in a period of four months. The dates on which the whitewashing or colourwashing is carried out shall be entered in the prescribed register (Form 2):

Provided that this rule shall not apply to latrines and urinals, the walls, ceilings or partitions of which are laid in glazed tiles or otherwise finished to provide a smooth, polished, impervious surface and that they are washed with suitable detergents and disinfectants at least once in every period of four months.

26. CONSTRUCTION AND MAINTENANCE OF DRAINS.- All drains carrying waste or sullage water shall be constructed in masonry or other impermeable material and shall be regularly flushed and the effluent disposed of by connecting such drains with a suitable drainage line:

Provided that where there is no such drainage line, the effluent shall be deodorized and rendered innocuous and then disposed of in a manner suitable to the satisfaction of the local Health Officer concerned.

27. WATER TAPS IN LATRINES.- Where piped water supply is available, a sufficient number of water taps, conveniently accessible, shall be provided in or near latrine accommodation. A tap per each latrine is to be preferred. There shall be at least one tap for every ten latrines or part thereof. The water taps shall be connected to the Municipal water supply or to an overhead storage tank of sufficient capacity, so that water is available from the taps during all hours when the workers are in the factory. Wherever commode type of latrines are provided arrangements shall be made for providing toilet paper and soap solution, in addition to the water tap. The toilet paper and soap solution shall be regularly replenished.

28. NUMBER AND LOCATION OF SPITTOONS.- The number and location of the spittoons to be provided shall be to the satisfaction of the Inspector. Such spittoons shall be placed on a stand or a bracket 90 cm. high.

29. TYPE OF SPITTOONS.- The spittoons shall be of either of the following types, namely:-

(a) a galvanized iron container with a conical funnel-shaped cover. A layer of suitable disinfectant liquid shall always be

maintained in the container; or

(b) a container filled with dry clean sand, and covered with a layer of bleaching powder; or

(c) any other type approved by the Competent Authority.

30. CLEANING OF LATRINES, URINALS, WORKPLACES & SPITTOONS.- Latrines, urinals, washplaces & spittoons shall be maintained in clean & sanitary conditions by employing adequate number of sanitary staff.

31. Qualifications of competent person with reference to various Sections of the Act are given in the schedule below.

SCHEDULE

The Competent Person is a person who is having a degree in the discipline mentioned or equivalent followed by experience as specified, in responsible position in the field and designated by the Competent Authority.

Sl. No.	Rules made under section of the Act requiring competency	Type of work	Discipline	Experience
1	2	3	4	5
1.	Section(6)	Civil construction structural work.	Civil or & structural engineering	Minimum 10 yrs in design, construction testing or repairs of structures, knowledge of various codes pertaining to the non destructive testing methods.
2.	Section21(2)	Operation of dangerous machines	Electrical or mechanical engineering or equivalent	Minimum 7 yrs in design, operation maintenance, testing of relevant machinery, guards, safety devices etc.
3.	Section 28	Lifts & Hoists	- do -	Min. 7 yrs. in design, erection maintenance, inspection and test procedures of Hoists & lifts.

Rule 31(Sch.)

1	2	3	4	5
4.	Section 29	Lifting Machinery Lifting tackles	Electrical, Mechanical or Metallurgical	Min.7 yrs. in design, erection maintenance, inspection. testing of lifting machinery or lifting tackle
5.	Section 31	Pressure plant	Chemical, Electrical or mechanical or metallurgical Engineering or equivalent	Min. 10 yrs experience in design, erection, maintenance, testing examination, inspection of pressure plants and knowledge of non destructive testing & codes of safety requirement of pressure vessels.
6.	Section 36	Dangerous fumes	Chemical engineering or masters degree in chemistry	Min.7 yrs. experience in collection and analysis of environmental samples and calibration of monitoring equipment.
7.	Section 41-C (b)	Supervision of handling of hazardous substances	Chemical engineering or masters degree in chemistry	Min. 7 yrs. experience on the shop floor in handling & disposal of hazardous chemicals.
8.	Section 87	Ventilation system	Electrical or mechanical engg.	Min.7 yrs. in design, fabrication, installation, testing of ventilation systems and systems used for collection of dusts, fumes etc.

Rule 32(Sch.)

CHAPTER IV

SAFETY

32. Without prejudice to the provisions of sub-section (1) of section 21 of the Act in regard to fencing , the further precautions specified in Schedules annexed here to shall apply to machines mentioned in each Schedule.

SCHEDULE I

WOODWORKING MACHINERY

1. Definitions.-For the purposes of this schedule -

(a) "woodworking machine" means a circular saw, band saw, planing machine, chain mortising machine or vertical spindle moulding machine operating on wood or cork;

(b) "circular saw" means a circular saw working in a bench (including a rack bench), but does not include a pendulum or similar saw which is moved towards the wood for the purpose of cutting operation;

(c) "band saw" means a band saw, the cutting portion of which runs in a vertical direction but does not include a log saw or band re-sawing machine; and

(d) "planing machine" means a machine for overhead planing or for thicknessing or for both operations.

2. Stopping and starting device.- An efficient stopping and starting device shall be provided on every woodworking machine. The control of this device shall be in such a position as to be readily and conveniently operated by the person in charge of the machine.

3. Space around machines.- The space surrounding every woodworking machine in motion shall be kept free from obstruction.

4. Floors.-The floor surrounding every woodworking machine shall be maintained in good and smooth condition, and shall not be allowed to become slippery, and as far as practicable shall be kept free from chips or other loosely scattered material.

5. Training and supervision.-

(a) No person shall be employed at a woodworking machine unless he has been sufficiently trained to work that class of machine, or unless he works under the adequate supervision of a person who has a thorough knowledge of the working of the machine.

(b) A person who is being trained to work a woodworking machine shall be fully and carefully instructed as to the dangers of the machine and the precautions to be observed to secure safe working of the machine.

6. Circular saws.-Every circular saw shall be fenced as follows:-

(a) behind and in direct line with the saw there shall be a riving knife, which shall have a smooth surface, shall be strong, rigid and easily adjustable, and shall also conform to the following conditions:-

(i) the edge of the knife nearer the saw shall form an arc of a circle having a radius not exceeding the radius of the largest saw used on the bench;

(ii) the knife shall be maintained as close as practicable to the saw, having regard to the nature of the work being done at the time, and at the level of the bench table. The distance between the front edge of the knife and the teeth of the saw shall not exceed 12 millimeters; and

(iii) for a saw of a diameter of less than 60 cm., the knife shall extend upwards from the bench table to within 25 mm. of the top of the saw, and for a saw of a diameter 60 cm. or over shall extend upwards from the bench table to a height of at least 23 cm.

(b) the top of the saw shall be covered by a strong and easily adjustable guard, with a flange at the side of the saw farthest from the fence. The guard shall be kept so adjusted that the said flange shall extend below the roots of the teeth of the saw. The guard shall extend from the top of the riving knife to a point as low as practicable at the cutting edge of the saw; and

(c) the part of the saw below the bench table shall be protected by two plates of metal or other suitable material, one on each side of the saw; such plates shall not be more than 15 cm. apart, and shall extend from the axis of the saw outwards to a distance of not less than 5 cm. beyond the teeth of the saw. Metal plates, if not beaded, shall be of a thickness of at least 2.5 mm., or if beaded, be of a thickness of at least 1.25 mm.

7. Push Sticks.-A push stick or other suitable appliance shall be provided for use at every circular saw and at every vertical spindle moulding machine to enable the work to be done without unnecessary risk.

8. Band saws.-Every band saw shall be guarded as follows:-

(a) both sides of the bottom pulley shall be completely encased by sheet or expanded metal or other suitable material;

(b) the front of the top pulley shall be covered with sheet or expanded metal or other suitable material; and

(c) all portions of the blade shall be enclosed or otherwise securely guarded, except the portion of the blade between the bench table and the top guide.

9. Planing machines.-

(a) A planing machine (other than a planing machine which is mechanically fed) shall not be used for overhand planing unless it is fitted with a cylindrical cutter block.

(b) Every planing machine used for overhand planing shall be provided with a "bridge" guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjusted both in a vertical and horizontal direction.

(c) The feed roller of every planing machine used for thicknessing, except the combined machine for overhand planing and thicknessing, shall be provided with an efficient guard.

10. Adjustment and maintenance of guards.-The guards and other appliances required under this schedule shall be -

(a) maintained in an efficient state;

(b) constantly kept in position while the machinery is in motion; and

(c) so adjusted as to enable the work to be done without unnecessary risk.

11. Exemptions.-Paragraphs 6, 8, 9 and 10 shall not apply to any woodworking machine in respect of which it can be proved that other safeguards are provided, maintained and used which render the machine as safe as it would be if guarded in the manner prescribed in this schedule.

SCHEDULE II

CENTRIFUGAL MACHINES

1. Definition.-"Centrifugal machines" include centrifugal extractors, separators and driers.

2. Every part of centrifugal machine shall be

(a) of good design and construction and of adequate strength;

(b) properly maintained; and

(c) examined thoroughly by a competent person at regular intervals to check for unbalance & in case unbalance at high speeds is observed steps to restore the balance shall be taken before commissioning the machine.

3. Interlocking guard for drum or basket.-

(a) The cage housing the rotating drum or basket of every centrifugal machine shall be provided with a strong lid. The design and construction of the cage as well as the lid shall be such that no access is possible to the drum or basket when the lid is closed.

(b) Every centrifugal machine shall be provided with an efficient interlocking device that will effectively prevent the lid referred to in sub-paragraph (a) from being opened while the drum or basket is in motion and prevent the drum or basket being set in motion while the lid is in the open position.

4. Braking arrangement.-Every centrifugal machine shall be provided with an effective braking arrangement capable of bringing the drum or basket to rest within as short a period of time as reasonably practicable after the power is cut off.

5. Operating speed.-No centrifugal machine shall be operated at a speed in excess of the manufacturer's rating which shall be legibly stamped at easily visible places both on the inside of the basket and on the outside of the machine casing.

SCHEDULE III

POWER PRESS

1. Application.- The Schedule shall apply to all types of power presses including press brakes, except when used for working hot metal.

2. Definition.- For the purpose of this Schedule -

(a) "approved" means approved by the Competent Authority;

(b) "fixed fencing" means fencing provided for the tools of a power press being fencing which has no moving parts associated with or dependent upon the mechanism of a power press and includes that part of a closed tool which acts as a guard;

(c) "power press" means a machine used in metal or other industries for moulding, pressing, blanking raising drawing and similar purposes;

(d) "safety device" means the fencing and any other safeguard provided for the tools of a power press.

3. Starting and stopping mechanism.- The starting and stopping mechanism shall be provided with a safety stop so as to prevent

over running of the press or descent of the ram during tool setting, etc.

4. Protection of tool and die.-

(a) Each press shall be provided with a fixed guard with a slip plate on the underside enclosing the front and sides of the tool.

(b) Each die shall be provided with a fixed guard surrounding its front and sides, and extending to the back in the form of a tunnel through which the pressed article falls to the rear of the press.

(c) The design, construction and mutual position of the guards referred to in (a) and (b) such as to preclude the possibility of the worker's hand or fingers approaching the danger zone.

(d) The machine shall be fed through a small aperture at the bottom of the die guard, but a wider aperture may be permitted for second or subsequent operations if feeding is done through a chute.

(e) Notwithstanding anything contained in sub-clauses (a) and (b) an automatic or an inter-locked guard may be used in place of a fixed guard, but where such guards are used they shall be maintained in an efficient working condition and if any guard develops a defect, the power press shall not be operated unless the defect of the guard is removed.

5. Appointment of persons to prepare power presses for use .-

(a) Except as provided in paragraph (4), no person shall set, re-set, adjust or try out the tools on a power press or install or adjust any safety device thereon, being installation or adjustment preparatory to production of die proving, or carry out an inspection and test of any safety device thereon required by paragraph 8 unless he-

(i) has attained the age of eighteen;

(ii) has been trained in accordance with the sub-paragraph (b); and

(iii) has been appointed by the occupier of the factory to carry out those duties in respect of the class or description of power press or the class or description of safety device to which the power press or the safety device (as the case may be) belongs; and the name of every such person shall be entered in a register in Form 1.

(b) The training shall include suitable and sufficient practical instruction in the matters in relation to each type of power press & safety device in respect of which it is proposed to appoint the person being trained.

6. Examination and testing of power presses and safety devices.-

(a) No power press or safety device shall be taken into use in any factory for the first time in that factory, or in case of a safety device for the first time on any power press, unless it has been thoroughly examined and tested, in the case of a power press, after installation in the factory, or in the case of a safety device, when in position on the power press in connection with which it is to be used.

(b) No power press shall be used unless it has been thoroughly examined and tested by a competent person within the immediately preceding period of 12 months.

(c) No power press shall be used unless every safety device (other than fixed fencing) thereon has within the immediately preceding period of six months when in position on that power press, been thoroughly examined and tested by a competent person.

(d) The competent person carrying out an examination and test under the foregoing provisions shall make a report of the examination and test containing the following particulars and every such report shall be kept readily available for inspection:

(i) name of the occupier of the factory;

(ii) address of the factory;

(iii) identification number or mark sufficient to identify the power press or the safety device;

(iv) date on which the power press or the safety device was first taken into use in the factory;

(v) the date of each periodical thorough examination carried out as per requirements of sub-paragraph (b) above;

(vi) particulars of any defects affecting the safe working of the power press or the safety device found at any such thorough examination and steps taken to remedy such defects;

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7. Defects disclosed during a thorough examination and tests .-

(a) Where any defect is disclosed in any power press or in any safety device by any examination and test under paragraph 6 and in the opinion of the competent person carrying out the examination and test, either-

(i) the said defect is a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used until the said defect has been remedied; or

(ii) the said defect may become a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used after the expiration of a specified period unless the said defect has been remedied.

Such defect shall, as soon as possible after the completion of the examination and test, be notified in writing by the competent person to the occupier of the factory and, in the case of a defect falling within clause (ii) of this sub-paragraph such notification shall include the period within which, in the opinion of the competent person, the defect ought to be remedied.

(b) In every case where notification has been given under this paragraph, a copy of the report made under paragraph 6(d) shall be sent by the competent person to the inspector for the area within fourteen days of the completion of the examination and test.

(c) Where any such defect is notified to the occupier in accordance with the foregoing provisions of this paragraph the power press or safety devise (as the case may be) having the said defect shall not be used -

(i) in the case of a defect falling within clause(i) of sub- paragraph (a) until the said defect has been remedied; and

(ii) in the case of defect falling within clause (ii) of sub-paragraph (a), after the expiration of the specified period.

(d) As soon as is practicable after any defect of which notification has been given under sub-paragraph(a) has been remedied, a record shall be made by or on behalf of the occupier stating the measures by which and the date on which the defect was remedied.

8. Inspection and test of safety devices.-

(a) No power press shall be used after the setting, resetting or adjustment of the

tools thereon unless a person appointed or authorised for the purpose under Paragraph 5 has inspected and tested every safety device thereon while it is in position on the said power press:

Provided that any inspection, test and certificate as aforesaid not be required where any adjustment of the tools has not caused or resulted in any alteration to or disturbance of any safety device on the power press and if, after the adjustment of the tools, the safety devices remain, in the opinion of such a person as aforesaid, in efficient working order.

(b) Every power press and every safety device thereon while it is in position on the said power press shall be inspected and tested by a trained person every day.

9. Defects disclosed during an inspection and test.-

(a) Where it appears to any person as a result of any inspection and test carried out by him under paragraph 8 that any necessary safety device is not in position or is not properly in position on a power press or that any safety device which is in position on a power press is not in his opinion suitable, he shall notify the manager forthwith.

(b) Except as provided in sub-paragraph (c) where any defect is disclosed in a safety device by any inspection and test under paragraph 8, the person carrying out the inspection and test shall notify the manager forthwith.

(c) Where any defect in a safety device is the subject of a notification in writing under paragraph 7 by virtue of which the use of the safety device may be continued during a specified period without the said defect having been remedied, the requirement in sub-paragraph (b) of this paragraph shall not apply to the said defect until the said period has expired.

10. Identification of power presses and safety devices.- For the purpose of identification every power press and every safety device provided for the same shall be distinctively and plainly marked.

11. Training and instructions to operators.- The operators shall be trained and instructed in the safe method of work before starting work on any power press. It shall be ensured by adequate supervision that correct operating procedures are being followed.

12. Exemptions.-

(a) If in respect of any factory, the Competent Authority is satisfied that owing to the circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this Schedule are not necessary for the

protection of the workers employed on any power press or any class or description of power press or in the factory, the Competent Authority by a certificate in writing(which he may in his discretion revoke at any time), exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.

(b) Where such exemption is granted, a legible copy of the certificate, showing the conditions (if any) subject to which it has been granted, shall be kept posted in the factory in a position where it may be conveniently read by the persons employed.

SCHEDULE IV

WELDING AND GAS CUTTING

1. Arc Welding.-

(a) Definition.- Arc welding is a welding process wherein coalescence is produced by heating with an electric arc, with or without application of pressure and with or without the use of filler metal.

(b) Correct and proper electric earthing shall be provided for the welding machine, the casing and the job to be welded. These shall be electrically checked for any leakage of current by an authorised and trained electrician.

(c) The welding machine shall be kept at a dry place and materials shall not be kept around it.

(d) The welding cable shall be in good condition. The metal wire shall not be in an exposed state anywhere. The welding cable connections shall be tight. The cable shall not lie on wet surface nor shall it pass through water. Building structure, fuel tanks, railings etc., shall not be used to support welding cables. As far as possible cable shall not be laid across the passages.

(e) The welder shall not wear any wet dresses, footwear, hand gloves etc. These articles must be dry before working with welding machines. The welder shall wear rubber shoes, hand gloves and use welding screens while doing welding jobs. Welding screen shall be used around the welding area to stop welding flashes from affecting others. The welder must check the welding holder thoroughly before starting the job and shall also see that the insulation of the holder is proper.

(f) The welding cable and holder etc., shall be fastened to the overhead structures with non-conductors to prevent these from dropping down.

(g) Scaffolding made of corrugated sheets shall be used below the areas where welding is to be done to prevent sparks dropping down below.

(h) While welding in confined areas like inside of tanks, pipes etc., proper ventilation shall be provided with the help of a fan.

(i) Welding on a gas or fuel line shall never be done without a special approved procedure written specially for the particular job.

(j) All welding work shall be started only after obtaining a welding permit from authorised agency indicating special precautions including the fire fighting details.

(k) For welding work on overhead equipment such as crane etc. a separate earth cable shall be run up to the work place and shall be connected to work piece.

2. Gas Cutting.-

(a) Definition.- Gas cutting is a process used for cutting mild steel by a flame torch using compressed gases Hydrogen/Acetylene and oxygen to preheat the metal and cutting it by forcing oxygen at higher pressure.

(b) The gas cylinders shall be kept well away from any fire or hot areas. The rubber pipes, joints, gas torches, valve connections shall be thoroughly checked for leakage of gas.

(c) The gas cutter shall use proper safety appliances viz. gas cutters goggles, hand gloves, safety shoes, helmets and safety belts.

(d) The rubber hose shall not come in contact with any hot material and it shall not be taken through hot areas.

(e) The gas torch shall be fastened to a fixed overhead structural or with the body of the gas cutter to stop it from dropping down.

(f) The rubber hose shall not obstruct the movement of others. When necessary to lower the rubber hose with fittings, a fibre rope should be used. A metal sheet shall be used below the job to arrest any sparks/hot slags from falling down.

(g) Before starting any gas cutting, a written permit clearance shall be obtained from authorised person which will indicate all Safety precautions including fire fighting details.

(h) Gas cutting at or near fuel line/hazardous area etc., shall be done only after obtaining a special approved procedure for that job.

(i) Provisions of Gas Cylinder Rules shall be complied with.

Rule 32 (Sch.V)

SCHEDULE V

SHEARS, SLITTERS AND GUILLOTINE MACHINES

1. Definition.- For the purpose of this Schedule -

(a) "guillotine" means a machine ordinarily equipped with straight, bevel-edged blade operating vertically against a stationery resisting edge and used for cutting metallic or non- metallic substances;

(b) "shears" or "shearing machine" means a machine ordinarily equipped with straight, bevel-edged blades operating vertically against resisting edges, or with rotary, overlapping cutting wheels, and used for shearing metals or non-metallic substances; and

(c) "slitter" or "slitting machine" means a machine ordinarily equipped with circular disc-type knives, and used for trimming or cutting into metal or non-metallic substances or for slitting them into narrow strips; for the purpose of this Schedule, this term includes bread or other food slicers equipped with rotary knives or cutting discs.

2. Guillotine and Shears.-

(a) Where practicable, a barrier metal guard of adequate strength shall be provided at the front of the knife, fastened to the machine frame and shall be so fixed as would prevent any part of the operator's body to reach the descending blade from above, below or through the barrier guard or from the sides:

Provided that in case of machines used in the paper printing and allied industries, where a fixed barrier metal guard is not suitable on account of the height and volume of the material being fed, there shall be provided suitable starting devices which require simultaneous action of both the hands of the operator or an automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade.

(b) At the back end of such machines, as inclined guard shall be provided over which the slit pieces would slide and be collected at a safe distance in a manner as would prevent a person at the back from reaching the descending blade.

(c) Power-driven guillotine cutters, except continuous feed trimmers, shall be equipped with -

(i) starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or

(ii) an automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the non-starting position after each complete cycle of the knife.

(d) Where two or more workers are employed at the same time on the same power-driven guillotine cutter equipped with two- hand control the device shall be so arranged that each worker shall be required to use both hands simultaneously on the safety trip to start the cutting motion, and at least one hand on a control to complete the cut.

(e) Power-driven guillotine cutters, other than continuous trimmer, shall be provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position.

3. Slitting Machines.-

(a) Circular disc-type knives on machines for cutting metal and leather, paper, rubber, textiles or other non-metallic substances shall, if within reach of operators standing on the floor or working level, be provided with guards enclosing the knife edges at all times as near as practicable to the surface of the material, and which may either-

(i) automatically adjust themselves to the thickness of the material; or

(ii) be fixed or manually adjusted so that the space between the bottom of the guard and the material will not exceed 6 mm (1/4 in.) at any time.

(b) Portions of blades underneath the tables or benches of slitting machines shall be covered by guards.

4. Index Cutters and Vertical Paper Slotters.- Index cutters, and other machines for cutting strips from the ends of books, and for similar operations, shall be provided with fixed guards, so arranged that the fingers of the operators cannot come between the blades and the tables.

5. Corner Cutters.- Corner cutters, used in the manufacture of paper boxes, shall be equipped with -

(a) suitable guard fastened to the machines in front of the knives and provided with slots or perforations to afford visibility of the operations; or

(b) other guards equally efficient for the protection of the fingers of the workers.

Rule 32(Sch.V-VI)

6. Band Knives.- Band wheels on band knives, and all portions of the blades except the working side between the sliding guide and the table on vertical machines, or between the wheel guards on horizontal machines, shall be completely enclosed with hinged guards of sheet metal not less than 1 mm(0.04 in) in thickness or of other material of equal strength.

SCHEDULE VI

AGITATORS AND MIXING MACHINES

1. Definition.- "Agitators and Mixing Machines" means a tank or other container equipped with power-driven mixing arms, blades or paddle wheels fixed to revolvable shafts or other simple mechanical devices for blending stirring liquids with other liquids or with solid substances or combinations of these.

2. When the top of an open agitator tank, beater tank or paddle tank or similar vessel is less than 1 M above the adjacent floor or working level, adequate standard railings shall be installed on all open sides.

3. Agitators and mixing machines shall be provided with an efficient inter-lock arrangement for the top lid, to prevent access to the agitating, stirring or similar devices, whilst in motion and would prevent restart under power with the lids in open position.

4. When other inspection or examination openings are provided at the top or sides of the containers vessels of the agitator and mixing machines, such openings shall be provided with standard grill guards as would prevent access of any part of the operator's body coming in contact with agitator stirring or similar devices whilst in motion.

5. When discharge holes, openings, chutes or similar arrangements are provided at bottom or at the sides of the container vessels of the agitator and mixing machines, they shall, be so designed, shaped guarded, or situated as would prevent access of any part of operator's body coming in contact with agitating, stirring or similar devices, whilst in motion inside the vessel.

Rule 32 (Sch. -VII)

SCHEDULE VII

CONVEYORS

1. Application.- The schedule shall apply to all types of conveyors.

2. Definition.- Conveyor means a horizontal, inclined or vertical device for moving or transporting bulk materials, packages & objects in a path predetermined by the design of device and having points of loading or discharge fixed or selective.

3. General.- The conveyors shall be so designed installed, operated & maintained as per the national code & standards. Safe procedures shall be laid down to include the following, namely:-

   (a) All moving parts of conveyors such as gears, sprockets, sheaves etc. shall be guarded;

   (b) The starting switch of conveyor shall be located at such a place so that the operator shall have clear view of the entire conveyor length;

   (c) The entire system shall be so interlocked by electrical or mechanical means that it can stop automatically if there is a blockage at any place along the length;

   (d) Conveyors operating in series shall have controls so designed that if one of the conveyor stops others shall automatically stop;

   (e) Electrical machines operating the conveyors equipped with brakes which are mechanically applied or released by movement of operating device, shall be so designed that if the electrical power is interrupted with brakes in OFF position, load can descend only at controlled speed;

   (f) Antirunaway or backstop devices shall be provided on reversible type of conveyors where reversing can cause hazard;

   (g) Overload protecting devices shall be provided on conveyors which shall disconnect the electrical power. All restarting devices shall remain locked till the cause of overload is removed;

   (h) For conveyors feeding the hopper at or near level of floor, the hopper shall be provided with screen or railing and toe-board;

   (i) Conveyors handling flammable material or fine powders shall have only explosion proof electrical fixtures. The dust levels in the area shall be restricted to PLE Limits by suitable means; and

   (j) Conveyors running in tunnels & pits shall have sufficient clearance at sides for workers engaged in lubricating or repair works.

4. Conveyors at height.-

   (a) Conveyors at elevated locations shall be provided with access platform with toe-board & guard rails.

(b) Conveyors installed within 2 metres of floor or walkway surface shall be provided with crossovers or passages

(c) Overhead conveyors shall be provided with sideboards along the edges & screen guards underneath. Underpasses shall be provided with sheet metal ceiling for protection of the persons crossing.

(d) Conveyors passing through building floors, walls shall have interlocks installed in such a way that all will have to operate at one time to start the system. These switches shall be clearly marked & area near them shall be kept clean and free of obstructions. The openings shall be guarded with hand rails, toe-boards etc.

5. Maintenance.- The operation, maintenance of conveyors shall be done under work permit system keeping in mind the nature of materials handled. The entire mechanism of conveyors, electrical switches, interlocks etc. shall be inspected and maintained regularly especially for brakes, back stops, anti-runaway devices, overload releases and such other safety devices.

6. Fire Fighting.- The entire length of the conveyor shall be covered by installation of fire detection and warning system. Wherever conveyor passes through wall or floor openings, automatic system shall be installed for closing of them to stop the passage of flame through them. Wherever necessary automatic water sprinkler system shall also be provided.

33. Register of workers employed for work on or near machinery in motion.-In every factory a register shall be maintained in Form 1 in which the name and other particulars of every such worker as may be employed for such examination or operation as referred to in the proviso to sub-section (1) of section 21 shall be entered.

34. HOISTS AND LIFTS.-

(1) A register shall be maintained to record particulars of examination of hoists and lifts and shall give particulars as shown in Form 3.

(2) In pursuance of the provisions of sub-section (4) of Section 28, in respect of any class or description of hoist or lift specified in the first column of the following Schedule, the requirements of section 28 specified in the second column of the said Schedule and set opposite to that class or description of hoist or lift shall not apply.

SCHEDULE

Class or description of hoist or lift	**Requirements which shall not apply**
Hoists or lifts mainly used for raising materials for charging blast furnaces or lime kilns.	Sub-section 1(b) in so far as it requires a gate at the bottom landing; sub-section1(d); sub-section 1(e)
Hoists not connected with mechanical power and which are not used for carrying persons.	Sub-section 1(b) in so far as it requires the hoistway or liftway enclosure to be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part; sub-section 1(e)

35. LIFTING MACHINES, CHAINS, ROPES AND LIFTING TACKLES.-

(1) No lifting machine and no chain, rope or lifting tackle, except a fibre rope or fibre rope sling, shall be taken into use in any factory for the first time in that factory unless it has been tested and all parts have been thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load or loads and signed by the person making the test and the examination, has been obtained and is kept available for inspection.

(2) Every jib-crane so constructed that the safe working load may be varied by the raising or lowering of the jib, shall have attached there to either an automatic indicator of safe working loads or an automatic jib angle indicator and a table indicating the safe working load at corresponding inclinations of the jib or corresponding radii of the load. An audio-visual alarm be preferably provided in addition, to give alarm wherever the limits given in table are exceeded.

(3) A table showing the safe working loads of every kind and size of chain, rope or use, and, in the lifting tackle in case of a multiple sling, the safe working loads at different angles of the legs, shall be pasted in the store in which the chains, ropes or lifting tackles are kept, and in prominent positions on the premises, and no chain, rope or lifting tackle not shown in the table shall be used:

Provided that this sub-rule shall not apply in respect of such lifting tackle if the safe working load thereof, or in the case of a multiple sling, the safe working load at different angles of the legs, is plainly marked upon it.

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(4) The register to be maintained under clause (a)(iii) of sub-section (1) of Section 29 of the Act shall contain the report as given in Form - 4, giving following particulars and shall be kept readily available for inspection:-

(a) Name of occupier of factory.

(b) Address of factory.

(c) Distinguishing number or mark, if any, and description sufficient to identify the lifting machine, chain, rope, or the lifting tackle.

(d) Date when the lifting machine, chain, rope or lifting tackle was first taken into use in the factory.

(e) Date and number of the certificate relating to any test and examination made under sub-rules (1) and (15) together with the name and address of the person who issued the certificate.

(f) Date of each periodical thorough examination made under clause (a) (iii) of sub-section(1) of Section 29 of the Act and sub-section (3) and by whom it was carried out.

(g) Date of annealing or other heat treatment of the chain and other lifting tackle made under sub-rule (7) and by whom it was carried out.

(h) Particulars of any defects affecting the safe working load found at any such thorough examination or after annealing and of the steps taken to remedy such defects.

(5) All rails on which a travelling crane moves and every track on which the carriage of a transporter or runway moves shall be of proper size and adequate strength and have an even running surface; and every such rail or track shall be properly laid, adequately supported and properly maintained.

(6) To provide access to rail tracks of overhead travelling cranes suitable passage-ways of at least 50 centimeters width with toeboards and double hand rails 90 centimeters high shall be provided alongside, and clear of, the rail tracks of overhead travelling cranes, such that no moving part of the crane can strike persons on the ways, and the passage-way shall be at a lower level than the crane track itself. Safe access ladders shall be provided at suitable intervals to afford access to these passage-ways, and from passage-ways to the rail tracks:

Provided that the Competent Authority may, for reasons to be specified in writing, exempt any factory in respect of any overhead travelling crane from the operation of any provision of this sub-rule subject to such conditions as it may specify.

(7) All chains and lifting tackles except a rope sling shall, unless they have been subjected to such other heat treatment as may be approved by the Competent Authority of Factories, be effectively annealed under the supervision of a competent person at the following intervals:-

(a) all chains, slings, rings, hooks, shackles and swivels used in connection with molten metal or molten slag or when they are made of 12.5 millimeters bar or smaller, once at least in every six months; and

(b) all other chains, rings, hooks, shackles and swivels in general use, once at least in every twelve months:

Provided that chains and lifting tackle not in frequent use shall, subject to the Competent Authority's approval, be annealed only when necessary. Particulars of such annealing shall be entered in a register prescribed under sub-rule (4).

(c) Slinging-

(i) Chains shall not be joined by bolting or wiring links together. They shall not be shortened by tying knots. A chain in which the links are locked, stretched or do not move freely shall not be used. The chain shall be free of kinks and twists. Proper eye splices shall be used to attach the chain hooks.

(ii) Pulley blocks of the proper size shall be used to allow the rope free play in the sheave grooves and to protect the wire rope from sharp bends under load. Idle sling shall not be carried on the crane hook along with a loaded sling. When idle slings are carried they shall be hooked.

(iii) While using multileged slings, each sling or leg shall be loaded evenly and the slings shall be of sufficient length to avoid a wide angle between the legs.

(iv) Sling hitches on loads shall be made under the supervision of experienced persons.

(8) Nothing in the foregoing sub-rule (7) shall apply to the following classes of chains and lifting tackles, namely:-

(a) chains made of malleable cast iron;

(b) plate link chains;

(c) chains, rings, hooks, shackles and swivels made of steel or of any non-ferrous metal;

(d) pitched chains, working on sprocket or pocketed wheels;

(e) rings, hooks, shackles and swivels permanently attached to pitched chains, pulley blocks or weighing machines;

(f) hooks and swivels having screw threaded parts or ball bearing or other case hardened parts;

(g) socket shackles secured to wire ropes by white-metal capping; and

(h) bordeaux connections:

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Provided that such chains and lifting tackles shall be thoroughly examined by a competent person once at least in every twelve months, and particulars entered in the register kept in accordance with sub-rule (4).

(9) Cranes shall be operated only by authorised persons who are well trained and experienced, operators shall ensure that all safety devices are functioning properly before crane is put into operation.

(10) A mobile crane shall be operated so that none of its parts can approach live electric lines closer than 3 m. While lifting loads such a crane shall be located on level ground.

(11) Standard signals shall be used and operators shall recognise signals from only one person during crane operation. Signal men shall direct equipment movement at fills, quarries, pits, intersections or any other place where necessary to prevent possible accidents.

(12) No person shall be permitted to work or walk under a load.

(13) Thorough inspection and load testing of a crane shall be done by a competent person at least once every 12 months. The load to be used for the purpose of testing shall be as follows:

Safe working load Test load

Up to 20 tons 25% in excess

20 - 50 tons 5 tons in excess

Over 50 tons 10% in excess

(14) All lifting machines, ropes, chains and lifting tackles, except a fibre rope or fibre sling, which have been lengthened, altered or repaired by welding or otherwise, shall, before being again taken into use, be adequately re-tested and re-examined by a competent person and certificate of such test and examination be obtained, and particulars entered in the register kept in accordance with sub-rule (4).

(15) No person under 18 years of age and no person who is not sufficiently competent and reliable shall be employed as driver of a lifting machine whether driven by mechanical power or otherwise, or to give signals to a driver.

(16) Where the Competent Authority is satisfied that in a factory due to shutdown or for any other reasons it is not practicable to maintain a minimum distance of 6 metres between the person employed or working on or near the wheel track of a travelling crane and the crane, it may on the request of the manager reduce the distance to such extent as it may consider necessary and also prescribe further precautions indicating appointment of suitable number of supervisors to ensure the safety of the persons while they are employed or working on or near the track.

36. PRESSURE VESSELS OR PLANTS.-

(1) Interpretation.-In this rule-

(a) "design pressure" means the maximum pressure that a pressure vessel or plant is designed to withstand safely when operating normally;

(b) "maximum permissible working pressure" means the maximum pressure at which a pressure vessel or plant is permitted to be operated or used under this rule and is determined by the technical requirement of the process;

(c) "plant" means a system of piping that is connected to a pressure vessel and is used to contain a gas, vapour or liquid under pressure greater than the atmospheric pressure, and includes the pressure vessel;

(d) "pressure vessel" means a vessel that may be used for containing, storing, distributing, transferring, distilling, processing or otherwise handling any gas, vapour or liquid under pressure greater than the atmospheric pressure and includes any pipeline fitting or other equipment attached thereto or used in connection therewith; and

(e) "competent person" means a person as defined in Sr.No. 5. of schedule to rule 31.

(2) Exceptions.-Nothing in this rule shall apply to -

(a) vessels made of ferrous materials having an internal operating pressure not exceeding 1 kilogram per square centimeter;

(b) steam boilers, steam and feed pipes and their fittings coming under the purview of the Indian Boilers Act, 1923;

(c) metal bottles or cylinders used for storage or transport of compressed gases or liquefied or dissolved gases under pressure covered by the Gas Cylinder Rules, 1981 framed under the Indian Explosives Act, 1884;

(d) vessels in which internal pressure is due solely to the static head of liquid;

(e) vessels with a nominal water capacity not exceeding 500 litres connected in a water-pumping system containing air that is compressed to serve as a cushion;

(f) vessels for nuclear energy application shall be covered by rules framed by Competent Authority;

(g) refrigeration plant having a capacity of 3 tons or less of refrigeration in 24 hours; and

(h) working cylinders of steam engines or prime movers, feed pumps and steam traps; turbine casings; compressor cylinders; steam separators or dryers; steam strainers; steam de-super- heaters; oil separators; air receivers for fire sprinkler installations; air receivers of monotype machines provided the maximum working pressure of the air receiver does not exceed 130 kPa (1.33 kg/sq.cm) and the capacity 85 litres; air receivers of electrical circuit breakers; air receivers of electrical relays; air vessels on pumps, pipe coils, accessories of instruments and appliances such as cylinders and piston assemblies used for operating relays and interlocking type of guards; vessels with liquids subjected to static head only; and hydraulically operating cylinders other than any cylinder communicating with an air loaded accumulator.

(3) Design and construction.-Every pressure vessel or plant used in a factory -

(a) shall be properly designed on sound engineering practice;

(b) shall be of good construction, sound material, adequate strength and free from any patent defects; and

(c) shall be properly maintained in a safe working condition:

Provided that the pressure vessel or plant in respect of the design and construction of which there is an Indian standard or a standard of the country of manufacture or any other law or regulation in force, shall be designed and constructed in accordance with the said standards, law or regulation, as the case may be, and a certificate thereof shall be obtained from the manufacturer or from the competent person which shall be kept and produced on demand by an Inspector.

(4) Safety devices.-Every pressure vessel shall be fitted with-

(a) a suitable safety valve or other effective pressure relieving device of adequate capacity to ensure that the maximum permissible working pressure of the pressure vessel shall not be exceeded. It shall be set to operate at a pressure not exceeding the maximum permissible working pressure and when more than one protective device is provided, only one of the devices need be set to operate at the maximum permissible working pressure and the additional device shall be set to discharge at a pressure not more than 5 percent in excess of the maximum permissible working pressure;

(b) a suitable pressure gauge with a dial range not less than 1.5 times the maximum permissible working pressure, easily visible and designed to show at all times the correct internal pressure and marked with a prominent red mark at the maximum permissible working pressure of the pressure vessel;

(c) a suitable nipple and globe valve connected for the exclusive purpose of attaching a test pressure gauge for checking the accuracy of the pressure gauge referred to in clause (b) of this sub-rule;

(d) a suitable stop valve or valves by which the pressure vessel may be isolated from other pressure vessels or plant or source of supply of pressure. Such a stop valve or valves shall be located as close to the pressure vessel as possible and shall be easily accessible;

which shall be 1.5 times the maximum permissible working pressure:

Provided that the pressure vessel or plant which is so designed and constructed that it cannot be safely filled with water or liquid or is used in service when even some traces of water cannot be tolerated, shall be pneumatically tested at a pressure not less than the design pressure or maximum permissible working pressure as the case may be:

Provided further that the pressure vessel or plant which is lined with glass shall be tested hydrostatically or pneumatically as required at a pressure not less than the design pressure or maximum permissible working pressure as the case may be.

Explanation:- Design pressure shall be not less than the maximum permissible working pressure and shall take into account the possible fluctuations of pressure during actual operation.

(b) No pressure vessel or plant shall be used in a factory unless there has been obtained from the maker of pressure vessel or plant or from the competent person a certificate specifying the design pressure or maximum permissible working pressure thereof, and stating the nature of tests to which the pressure vessel or plant and its fittings (if any) have been subjected, and every pressure vessel or plant so used in a factory shall be marked so as to enable it to be identified as to be the pressure vessel or plant to which the certificate relates and certificate shall be kept available for perusal by the Inspector.

(c) No pressure vessel or plant shall be permitted to be operated or used at a pressure higher than its design pressure, or the maximum permissible working pressure as shown in the certificate.

(7) In-service test and examinations.-

(a) Every pressure vessel or plant in service shall be thoroughly examined by a competent person -

(i) externally, once in every period of six months; and

(ii) internally, once in every period of twelve months:

Provided that if by reason of the construction of a pressure vessel or plant, a thorough internal examination is not possible, this examination may be replaced by a hydrostatic test which shall be carried out once in every period of two years:

Provided further that for a pressure vessel or plant in continuous process which cannot be frequently opened, the period observations, findings and conclusions with other relevant remarks with reasons and may authorise the pressure vessel or plant to be used and kept in operation subject to a lowering of maximum permissible working pressure, or to more frequent or special examination or test, or subject to both of these conditions.

(b) A report of every examination or test carried out shall be completed in Form 5 and shall be signed by the person making the examination or test, and shall be kept available for perusal by the Inspector at all hours when the factory or any part thereof is working.

(c) Where the report of any examination under this rule specified any condition for securing the safe working of any pressure vessel or plant, the pressure vessel or plant shall not be used unless the specified condition is fulfilled.

(d) The competent person making report of any examination under this rule, shall within seven days of the completion of the examination, send to the Competent Authority a copy of the report in every case where the maximum permissible working pressure is reduced or the examination shows that the pressure vessel or plant or any part thereof cannot continue to be used with safety unless certain repairs are carried out or unless any other safety measure is taken.

(10) Application of other laws.-

(a) The requirements of this rule shall be in addition to and without any prejudice to and not in derogation of the requirements of any other law in force.

(b) Certificates or reports of any examination, or test of any pressure vessel or plant to which sub-rules (7) to (9) do not apply, conducted or required to be conducted under any other law in force and other relevant record relating to such pressure vessel or plant, shall be properly maintained as required under the said law and shall be produced on demand by the Inspector.

38. EXCESSIVE WEIGHTS.-

(1) No person, unless aided by another person or any mechanical device, shall carry or move by hand or head any material, article, tool or appliance exceeding the maximum limit in weight set out in the following Table:-

TABLE

Persons	Max. weight of material, article, tool or appliance in kg
a) Adult Male	55
b) Adult female	30

Provided that the dimensions of material, tool or appliance shall be such as not to make worker unstable and not to hurt others:

Provided further that pregnant females shall not be engaged for lifting loads.

(2) No female worker shall engage in conjunction with others, in lifting carrying or moving by hand or on head any material article, tool or appliance if the weight thereof exceeds the lowest weight fixed by Table to sub rule (1) above for any of the persons engaged multiplied by the persons engaged.

Rules -39

39. PROTECTION OF EYES.- Effective screens or suitable goggles shall be provided for the protection of persons employed in or in the immediate vicinity of the following processes, namely:-

(1) The processes specified in Schedule I to this rule, being processes which involve risk of injury to eyes from particles or fragments thrown off in the course of the processes.

(2) The processes specified in Schedule II to this rule, being processes which involve risk of injury to eyes by reason of exposure to excessive light or infra-red or ultra-violet radiations.

SCHEDULE I

INJURY TO EYE FROM PARTICLES

1. Breaking, cutting, dressing or carving of bricks, stone, concrete, slag or similar materials by means of a hammer, chisel, pick or similar hand tool, or by means of a portable tool driven by mechanical power, and the dry grinding of surfaces of any such materials by means of a wheel or disc driven by mechanical power, where in any of the foregoing cases, particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

2. Dry grinding of surfaces of metal by applying them by hand to a wheel, disc or band driven by mechanical power, and of surfaces of metal by means of a portable tool driven by mechanical power.

3. Dividing into separate parts of metal, bricks, stone, concrete or similar materials by means of a high speed saw driven by mechanical power or by means of an abrasive cutting-off wheel or disc driven by mechanical power.

4. Turning of metals or articles of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

5. Drilling by means of portable tools, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

6. Welding and cutting of metals by means of an electric, oxy- acetylene or similar process.

7. Hot fettling of steel castings by means of a flux-injected burner or air torch, and de-seaming of metal.

8. Fettling of metal castings involving the removal of metal, including runners, gates and risers, and removal of any other material during the course of such fettling.

9. Chipping of metal, and chipping, knocking out, cutting out or cutting off of cold rivets, bolts, nuts, lugs, pins, collars or similar articles from any structure or plant, or from part of any structure or plant, by means of a hammer, chisel, punch or similar hand tool, or by means of a portable tool driven by mechanical power.

10. Chipping or scurfing of paint, scale, slag, rust or other corrosion from the surface of metal and other hard materials by means of a hand tool or by a portable tool driven by mechanical power.

Rule 39(Sch.I-II)

11. Breaking of scrap metal by means of a hammer or by means of a tool driven by mechanical power.

12. Routing of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

13. Work with drop hammers and power hammers used in either case for the manufacture of forgings, and work by any person not working with such hammers, whose work is carried on in such circumstances and in such a position that particles or fragments are liable to be thrown off towards his face during work with drop hammers or power hammers.

14. Work at a furnace where there is risk to the eyes from molten metal.

15. Pouring or skimming of molten metal.

16. Work involving risk to the eyes from hot sand being thrown off.

17. Truing or dressing of an abrasive wheel.

18. Handling in open vessels or manipulation of strong acids or dangerous corrosive liquids or materials, and operation, maintenance or dismantling of plant or any part of plant being plant or part of plant which contains or has contained such acids, liquids or materials, unless the plant or part of plant has been so prepared (by isolation, reduction of pressure, or otherwise), treated, or designed and constructed as to prevent risk of injury.

19. Any other process wherein there is a risk of injury to eyes from particles or fragments thrown off during the course of the process.

SCHEDULE II

INJURY TO EYE FROM LIGHT AND RADIATION

1. Welding or cutting of metals by means of an electrical, oxy- acetylene or similar process.

2. All work on furnaces where there is risk of exposure to excessive light or infra-red radiations.

3. Process such as rolling, casting or forging of metals, where there is risk of exposure to excessive light heat or infra-red radiations.

4. Any other process wherein there is a risk of injury to eyes from exposure to excessive light or infra-red or ultra-violet radiations.

40. MINIMUM DIMENSIONS OF MANHOLES.- Every chamber, tank, vat, pipe, flue or other confined space, which persons may have to enter and which may contain dangerous fumes to such an extent as to involve risk of the persons being overcome thereby, shall unless there is other effective means of egress, be provided with a manhole which may be rectangular, oval or circular in shape, and shall have the following dimensions as minimum, namely:-

Rectangular shape- 50 cm X 30 cm

Oval shape - Major & minor axis diameters 50 cm. and 30 cm. respectively.

Circular shape - 50 cm diameter

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41. EXEMPTIONS.- The requirements of sub-section (4) of section 37 of the Act shall not apply to the following processes carried on in any factory, namely:-

(1) the operation of repairing a water sealed gasholder by the electric welding process, subject to the following conditions, namely:-

(a) the gasholder shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture:

Provided that this exemption shall not apply to any gasholder containing acetylene or mixture of gases to which acetylene has been added intentionally; and

(b) welding shall only be done by the electric welding process and shall be carried out by experienced operatives under the constant supervision of a competent person;

(2) the operations of cutting or welding steel or wrought iron gas mains and services by the application of heat, subject to the following conditions, namely:-

(a) the main or service shall be situated in the open air, and it shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture;

(b) the main or service shall not contain acetylene or any gas or mixture of gases to which acetylene has been added intentionally;

(c) the operation shall be carried out by an experienced person or persons and at least 2 persons (including those carrying out the operations) experienced in work on gas mains and over 18 years of age shall be present during the operation;

(d) the site of the operation shall be free from any flammable or explosive gas or vapour;

(e) where acetylene gas is used as a source of heat in connection with an operation, it shall be compressed and contained in a porous substance in a cylinder; and

(f) prior to the application of any flame to the gas main or service, this shall be pierced or drilled and the escaping gas ignited.

45. PLANNING OF BUILDING CONSTRUCTION & ROADS, SIDEWALKS.-

(1) General.- All constructions shall conform to National Building Code of Indian Standards Institution now Bureau of Indian Standards.*

(2) Means of access for industrial buildings.-

(a) Means of access for industrial buildings & those buildings which attract large crowd shall be adequate.

The length of the main access shall be determined by the distance from the farthest building to the public street. The length of the subsidiary accessories shall be measured from the point of its' origin to the next wider road on which it meets.

(b) Pathways: The approach to the buildings from road/street/internal means of access shall be adequate and through paved pathways.

(c) Intersection of Roads: For intersection junction of roads meeting at right angles as well as other than right angles, the rounding off or cut off or splay or similar treatment shall be done, depending upon the width of the roads, traffic, sighting angle etc. to provide clear sight distance.

(d) Speed Breakers & Pedestrian Passage: Speed breakers shall be provided on all roads which lead to main road near the junction. The pedestrian crossings shall be marked.

(e) Sign Boards & Signs: Sign boards displaying information on maximum permissible speeds and appropriate road signs wherever required shall be provided. The maximum permissible speed on internal roads shall be decided by the manager of the factory depending on the traffic, size and number of vehicles, number of persons working in a particular building etc. The sign boards, road signs & pedestrian crossings shall be of fluorescent paint. The speed limit on various roads shall be decided by the factory manager.

(3) Guarding of pits, sumps, trenches, manholes etc.-Pits, sumps, trenches, manholes and any other openings in the wall or floor shall be adequately covered or guarded. these shall be periodically checked and record maintained.

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* Note-The Code covers aspects of administrative regulations, development control rules & general building & fire protection requirements; rules for design of electrical, etc. installations; regulation for ventilation etc. & plumbing services; measures to ensure safety of workers & public during construction etc.

Rule - 46

46. CONSTRUCTION & ERECTION.-Manager shall take appropriate measures with the approval of the Inspector to minimise the effects of occupational hazards arising out of animals, reptiles, rodents, poisonous plants and weeds, weather conditions and living conditions.

(1) General.-

(a) Site preparation - While preparing the site for construction, bush and other wood, debris, etc, shall be removed and promptly disposed of so as to minimize the attendant hazards.

Temporary buildings for construction offices and storage shall be so located as to cause the minimum fire hazards and shall be constructed from non-combustible materials as far as practicable.

(b) Access for Fire Fighting Equipment & Vehicles - Access for fire fighting equipment shall be provided to the construction site at the start of construction and maintained until all construction work is completed:

(i) Free access from the street to fire hydrants/static water tanks, where available, shall be provided and maintained at all times;

(ii) No materials for construction shall be placed within 3m of hydrants/static water tanks; and

(iii) During building operations, free access to permanent, temporary or portable first-aid fire fighting equipment shall be maintained at all times.

(c) Access to the Upper Floors During Construction- In all buildings over two storeys high, at least one stairway shall be provided in usable condition at all times. This stairway shall be extended upward as each floor is completed. As far as possible, there shall be a handrail on the staircase.

(2) Storage, Stacking & Handling of Materials.-Construction of Plant and Building: Construction requires various kinds of materials such as cement; lime; masonary units; aggregate;. fly ash; timber; protective clothing; electrical fittings etc. These shall be stored and handled as per prevalent good practices & relevant national standards in order to ensure quality & quantity of materials used in the construction and safety of personnel handling these materials.

(3) Safety Requirements for Erection of Structural Steel Work.-

(a) Organization of Work - The agency responsible for erecting the steel work shall analyze the proposed erection scheme for safety. The erection scheme shall cover safety aspects right from the planning stage up to the actual execution of the work and make provision for personnel protective equipments.

(b) Safety of Men:

(i) General - Skilled workers trained in relevant jobs shall only be employed in jobs requiring skills.
(1) All personnel protective equipments like helmets, goggles, safety shoes, gloves, aprons etc. shall be suitable for the job & shall conform to relevant Indian Standards

(2) When the work is in progress, the area shall be cordoned off by barricades to structural components, or falling into excavated trenches or getting injured by falling objects.

(3) Warning signs shall be displayed where necessary to indicate hazards, for example (a) '440 VOLTS', (b) 'DO NOT SMOKE', (c) 'MEN WORKING AHEAD', etc.

(4) All electrically operated hand tools shall be provided with proper earthing.

(5) Hand lamps shall be of low voltage preferably 24 V to prevent electrical hazards.

(ii) Anchors for guys or ties shall be checked for proper placement. The weight of concrete in which the anchors are embedded shall be checked for uplift and sliding:

(1) Split-end eye anchors shall only be used in good, solid rock.

(2) The first load lifted by a guy derrick shall be kept at a small height for about 10 minutes and the anchors immediately inspected for any signs or indications of failure.

(3) When a number of trusses or deep girders are loaded in one car or on one truck, all but one being lifted shall be tied back unless they have been tied or braced to prevent their falling over and endangering men unloading.

(4) The erection gang shall have adequate supply of bolts, washers, rivets, pins, etc. of correct size. Enough number of bolts shall be used in connecting each piece using a minimum of two bolts in a pattern to ensure that the joint will not fail due to dead load and erection loads.

All splice connections in columns, crane girders, etc., shall be completely bolted or riveted or welded as specified in the drawing before erection.

(5) Safety belts shall always be provided & used for working at heights. The ropes shall be chemically treated to resist dew and rotting. These shall not be tied on sharp edges of steel structures. They shall be tied generally not more than 2 to 3 m. away from the belt.

(6) On a guy derrick or climbing crane job, the tool boxes used by the erection staff shall be moved to the new working floor each time the rig is changed. On a mobile crane job, the boxes shall be moved as soon as the crane starts operating in a new area too far away for the men to reach the boxes conveniently.

(7) Baskets or containers to hold small materials such as bolts and drift pins shall be provided to men working on floats or scaffolds. Men shall be trained to use such containers, and to keep small tools gathered up and put away in tool boxes when not in use. Material shall not be dumped overboard when a scaffold is to be moved. Rivet heaters shall have safe containers or buckets for hot rivets left over at the end of the day.

(8) During the erection of tall buildings, nylon nets at a height of 3 to 4 m. shall be provided to ensure safety of men if there is a fall from heights.

In case of industrial buildings the height of which is in excess of 4 m a temporary strong net shall be provided below the roof, at a height of 3 m to 4 m above the floor, over which workers are working.

(9) Safety Against Fire - A fire protection procedure shall be set up if there is to be any flame cutting, burning, heating, riveting or any operation that could start a fire. Following precautions shall be observed during welding and cutting operations.

(a) The workers shall be instructed not to throw objects like hot rivets, cigarette stubs, etc, around.

(b) Sufficient number of fire extinguishers, preferably of soda acid type shall be placed at strategic points. Extinguishers shall always be placed in cranes, hoists, compressors and similar places. Where electrical equipments are involved, CO2 or dry powder extinguishers shall be provided.

(10) Riding on a load, tackle or runner shall be prohibited.

(11) The load shall never be allowed to rest on wire ropes. Ropes in operation shall not be touched. Wire ropes/manila ropes conforming to acceptable standards shall be used for guying.

(12) Lifting Appliances - Necessary precautions as laid down in rule 37 shall be followed.

(c) Safety of Structure: General -The structure itself shall be safeguarded during its erection & erection of columns shall be immediately followed by vertical bracing between columns before the roof structure is erected.

(4) Excavation.-

(a) Excavation shall be planned in advance so that hazards due to falling and things falling are avoided. Accident prevention measures shall be adopted and effectively carried out on each job because of inherent dangers.

(b) Underground utilities such as water mains, drainage lines, electrical cables, gas lines etc. shall be located and protected wherever necessary.

(c) Adequate measures shall be taken to prevent dislodgement of loose or unstable earth, rock or other material from falling into the excavation by proper timbering.

(d) Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

(e) No excavation below the level of any foundation of a building or structure (if the excavation is liable to effect the building) shall be commenced unless adequate shoring has been provided to prevent any danger to the building.

(f) In every excavation work along sloping ground, sides and slopes of ground shall be maintained in a safe condition by scaling, benching or barricading. Loose earth and loose rock shall be scaled continuously. To ensure safety of workers engaged on such work, each worker shall be provided with safety belt attached to a safety line. On steep slopes workers shall not be permitted to work one above the other. All such scaling work shall be done under good supervision.

(g) All trenches, 120 cm or more in depth, shall at all times be supplied with at least one ladder for each 30 meters in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least one metre above the surface of the ground.

(h) Every accessible part on an excavation or an opening in the ground into which a person is liable to fall vertically through a height of 2 meters, shall be barricaded to a height of one metre.

(i) Measures shall be taken to prevent spectators and other workmen who are not engaged in excavation work, from approaching excavation areas by placing warning signals etc. near the site of the excavation. Provisions shall also be made to prevent animals from falling into excavation areas.

(5) Shoring.-

(a) Additional precautions by way of shoring and bracing shall be taken to prevent slides, slips or caveins when excavations or trenches are made in locations subject to vibrations from railway or road traffic, the operation of machinery or any other source of vibration.

(b) Excavation over 1.2 m in depth, unless in solid rock or hard soil shall be shored and braced or sloped to the angle of repose of the material when consolidated. All shoring and bracing shall extend to the bottom of the excavation when necessary.

(c) No person shall work in an excavation shaft, earth work of tunnel unless all timbering or planks used therein has been inspected by a competent person before the commencement of the work.

(6) Night work. –

(a) Excavated area shall be adequately lighted up for night work.

(b) During night, a red danger light shall be displayed at a conspicuous place near the excavation site to warn approaching traffic and men.

(7) Disposal of soil

The excavated material shall be dumped sufficiently away from the edge of the excavated trench to avoid the excavated material slipping and falling into the trench. The excavated materials and any other material or load shall not be dumped or placed within 1.5m of the edges of the trench or half of the depth of the trench whichever is more.

(8) Scaffolding:

(a) Suitable scaffolds shall be provided for workmen for all works that cannot be done safely from the ground.

(b) All the members of a scaffold such as planks, braces, vertical supports, horizontal supports shall be of sound material, good construction and of adequate strength. They shall be properly maintained.

(c) No plank shall be kept loose so that levering of the plank is avoided. Nails of proper size shall be used for construction of scaffolds in sufficient numbers and driven fully in.

(d) Scaffolding or staging more than 3.5 meters above the ground floor swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least one metre high above the the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

(e) On unprotected scaffolds at high elevations the men must wear life belts suitably anchored to some substantial part of the structure.

(f) Side screens shall be provided on scaffold erected along passageways.

(g) The platform of a suspended scaffold shall not be less than 45 cm. wide and points of suspension not more than 3 m apart and so arranged, that, at the working position, the edge is as close as practicable to the working face when persons have to work in a sitting position. Suspended scaffolds shall be tested as before use to ensure that minimum safety factors are maintained. The test will be made by raising the working surface 30 cm. above the ground and loading it with at least three times the maximum weight that will be imposed upon it.

(h) A safe and convenient means of access shall be provided to the platform or scaffold. Means of access may be a portable ladder, fixed ladder, ramp or a stairway. The use of cross braces or frame work as means of access to the working surface shall not be permitted.

(i) All scaffolds, before use, shall be examined by the engineer in charge.

(j) Every working place and approach thereto, every place where raising or lowering operations with the use of lifting appliance are in progress and all openings dangerous to persons employed shall be adequately and suitably lighted.

(k) During dismantling of scaffolds necessary precautions shall be taken to prevent injury to persons due to fall of loose materials.

(l) Bracings and other members of the scaffolds shall not be removed prematurely while dismantling the entire scaffold which shall be maintained stable and rigid so as to avoid the danger of collapse.

(m) Care shall be taken to see that no uninsulated electric wire exists within 3 metres of the working platform, gangways, runs, etc. of the scaffold.

(n) Good house-keeping shall be maintained at all times upon scaffolds, platforms and ramps. Excessive storage of materials thereon shall be avoided. Care must be taken to avoid accumulation of small objects such as tools, pieces of

(c) A man shall be specially employed as signalman to watch the movement of the bucket and warn the crew and vibrator operators of the approaching bucket so that all workers may clear out of the area affected by the bucket. Signalman shall be so stationed in a safe place that they can see the entire area where concrete is being placed.

(12) Work in open areas and specially at height shall be stopped under adverse weather conditions such as strong winds, snowfall, rainfall and under any other conditions specified by Safety Officer/Inspector.

47. TEMPORARY ELECTRICAL WIRING.-

(1) Frayed and / or bare wires shall not be used for temporary electrical connections during construction. All temporary wiring shall be installed and supervised by a competent electrician. Adequate protection shall be provided for all electrical wiring laid on floor which may have to be crossed over by construction machinery or by the workmen. All flexible wiring connecting the electrical appliances shall have adequate mechanical strength and shall preferably be enclosed in a flexible metal sheath. Overhead wires/cables shall be so laid that they leave adequate head room. Clearance for the above shall be obtained from the competent person.

(2) All electrical circuits, other than those required for illumination of the site at night, shall be switched off at the close of day's work. The main switch board from which connections are taken for lighting, power operated machinery, etc, shall be located in an easily accessible and prominent place. No article of clothing nor stores shall be kept at the back of or over the board or anywhere near it. One 3-kg/4.5-kg CO2 extinguisher or one 5-kg dry powder extinguisher shall be provided near the switch board.

48. BUILDINGS & STRUCTURES.- No building, wall, chimney, bridge, tunnel, road, gallery, stairway, ramp, floor, platform, staging, or other structure, whether of a permanent or temporary character, shall be constructed, situated or maintained in any factory in such a manner as to cause risk of bodily injury.

49. MACHINERY AND PLANT.- No machinery, plant or equipment shall be constructed, situated, operated or maintained in any factory in such a manner as to cause risk of bodily injury or adverse effect on health. The Safety Officer shall have authority to stop the work if he finds that unsafe practices are being followed and/or unsafe conditions exist.

50. METHODS OF WORK.- No process or work shall be carried in any factory in such a manner as to cause risk of bodily injury. Schedule for Hand Tools & Portable Power Tools is given below.

SCHEDULE

HAND TOOLS & PORTABLE POWER TOOLS

1. Hand tools:-

   (a) Definition: Hand tool means any tool which is used without any external motive power.

   (b) Hand tools shall be of good quality materials, conforming to relevant BIS standards and shall be used only for the job it is designed for. Non sparking tools such as that made of Beryllium Copper alloy shall be used for working in explosive areas.

   (c) Workers shall be trained & instructed for proper use of tools such as files, hammers, hacksaws etc.

   (d) Proper tool bags shall be provided to workers to carry the tools and not leaving them on floors, passages etc.

   (e) Protective equipments such as gloves, goggles etc. shall be provided to and worn by the workers.

   (f) The tools shall be inspected regularly, repaired and maintained.

2. Portable Power Tools.-

   (a) Definition: Portable Power Tool means a tool powered by electric or pneumatic power, operated by a single operator and which is transportable from place to place.

   (b) Portable power tools shall conform to the relevant BIS standards and shall be used for the job it is designed for. Starting switches shall be located at such places where accidental starting cannot take place.

   (c) Electrically operated tools shall be used only with 3 core cable with proper earthing provided. This should be checked before use.

(d) Electrically operated tools shall not be used where flammable vapours, gases or dusts are present, unless they are specially designed for use in such environment.

(e) Proper guards shall be provided for tools such as grinders, saws etc. and operators shall be provided with personal protective equipments wherever required.

(f) In case of pneumatic tools a short chain shall be provided for attaching the air hose and tools housings securely to prevent it from whipping in case of breaking of the coupling.

(g) Periodic inspection and maintenance shall be carried out for electrical insulation, earthing, integrity etc.

51. STACKING AND STORING OF MATERIALS, ETC.- No materials or equipment shall be stacked or stored in such a manner as to cause risk of bodily injury.

52. LADDERS.-

(1) Every ladder shall be of good construction, sound material and of adequate strength for the purpose for which it is used. The rungs shall be parallel, level and uniformly spaced at 30 cm.

(2) Ladders shall be inspected regularly and repaired immediately. No ladder with defective or missing rungs shall be used. Wooden ladders shall not be painted. For preserving the material from deterioration linseed oil or clear varnish shall be used.

(3) No portable single ladder shall be over 9 m in length while the width between side rails in rung ladder shall in no case be less than 28 cm for ladder up to and including 3 m in length. For longer ladders this width shall be increased at least 20 mm for each additional metre of length. Uniform step spacing shall not exceed 30 cm.

(4) All ladders with spreading bases such as step and trestle ladders shall be equipped with rigid spreads or some other means to prevent their premature opening or closing.

(5) Ladders shall be in a safe position before being climbed. The best angle for a ladder is 75 with the horizontal i.e., the distance of the base of the ladder from the wall, pole structure etc., as the case may be shall be 1/4th its length.

(6) A ladder shall be stored upon brackets and in sheltered locations.

(7) A ladder shall not be placed upon a box, barrel, or other movable insecure object and against a round or angular pillar such as pipe or narrow steel section etc.

(8) Two ladders must not be spliced together as far as possible. When it is inevitable they shall be tied together properly to ensure rigidity. Extra parallel members at the point of splicing may be added to each of the main members of the ladder. Two ladders shall not be spliced together to provide access to a greater height than when a single ladder is used.

(9) Bamboo ladders shall be provided with twisted wire loops enclosing both longitudinal members to prevent them from opening outwards. However, such ladders where longitudinal members are reinforced with metal/wire loops shall not be used when working on electrical circuits.

(10) Metal ladders with insulating rubber shoes shall only be used for working with electrical lines or in places where they may come in contact with such wires.

(11) No worker shall work from a plank placed on the rungs of ladders.

(12) All permanently installed vertical ladders above a height of 3 m shall have manguards provided.

53. OVENS AND DRIERS.-

(1) Application - This rule shall apply to ovens and driers, except those used in laboratories or kitchens of any establishment and those which have a capacity below 325 litres.

(2) Definition:- For the purpose of this rule, "oven or drier" means any enclosed structure, receptacle, compartment or box which is used for baking, drying or otherwise processing of any article or substance at a temperature higher than the ambient temperature of the air in the room or space in which explosive mixture of air and a flammable substance is likely to be evolved within the enclosed structure, receptacle, compartment or box or part thereof on account of the article or substance which is baked, dried or otherwise processed within it.

(3) Separate electrical connection.- Electrical power supplied to every oven or drier shall be by means of a separate circuit provided with an isolation switch.

(4) Design, Construction, examination and testing.-

(a) Every oven or drier shall be properly designed on sound engineering practice and be of good construction, sound materials and adequate strength, free from any patent defects and safe if properly used.

(b) No oven or drier shall be taken into use in a factory for the first time unless a competent person has thoroughly examined all its parts and carried out the tests as are required to establish that the necessary safe systems and controls provided for safety in operation for the processes for which it is to be used and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.

55. EXAMINATION OF EYE SIGHT OF CERTAIN WORKERS.-

(1) No person shall be employed to operate a crane, locomotive or fork-lift truck, or to give signals to a crane or locomotive operator unless his eyesight and colour vision have been examined and declared fit by a qualified ophthalmologist to work whether with or without the use of corrective glasses.

(2) The eye sight and colour vision of the person employed as referred to in clause 1 shall be examined at least once in every period of 12 months up to the age of 45 years and once in every 6 months beyond that age.

(3) Any fee payable for an examination of a person under this sub-rule shall be paid by the contractor/occupier and shall not be recoverable from that person.

(4) The record of examination or re-examination carried out as required under sub-rule 1 shall be maintained in Form-1.

57. QUALITY OF PERSONAL PROTECTIVE EQUIPMENT.-

All Personal Protective Equipment provided to workers as required under any of the provisions of the Act or the Rules shall conform to the relevant Indian Standards.

58. PROTECTIVE EQUIPMENT.- The Inspector may, having regard to the nature of the hazards involved in work and process being carried out, order the occupier or the manager in writing to supply to the workers exposed to particular hazard any personal protective equipment as may be found necessary.

59. THERMIC FLUID HEATERS.-

(1) All heaters shall be of such construction that coils are removable for periodic cleaning, visual inspection and hydraulic test.

(2) Suitable arrangements shall be made for cooling the furnace effectively in case of power failure.

(3) Before restarting the furnace, it shall be effectively purged.

(4) Velocity of flow of the thermic fluid shall not be allowed to fall below the minimum recommended by the manufacturers while the heater is in operation.

(5) The thermic fluid shall be circulated in a closed circuit formation with an expansion cum deaerator tank. This tank shall be located outside the shed where the heater is installed.

(6) Every heater shall be provided with a Photo-resistor actuated audio-visual alarm to indicate flame failure and automatic burner cut off.

(7) The stack temperature monitor-cum-controller with audio- visual alarm shall be provided so as to warn the operator in case the outlet temperature exceeds the specified minimum.

(8) Where inspection doors are provided on the furnace they shall be interlocked with the burner itself so that they cannot be opened until burner is shut off and furnace is cooled sufficiently.

(9) All heaters shall also be provided with the following safety devices:-

(a) level control in the expansion tank;

(b) temperature control of thermic fluid;

(c) differential pressure switch on the outlet line of the heater tubes; and

(d) temperature control device for the fuel oil supply to the burner.

(10) All evices mentioned in sub-rule (9)shall have interlocking arrangement with burner so that in case of any predetermined limits being crossed the supply of fuel and air to burner shall automatically be cut-off.

(11) All safety interlocks when operated shall be indicated on the control panel of the heater by a suitable audio visual alarm.

(12) Every heater unit shall be provided as a standard accessory an arrangement for sniffing with low pressure steam or nitrogen for putting out the fire.

(13) Electric panel for the heater shall be located near the heater but not so close as to be exposed to spilling or leaking oil.

(14) The heater shall be located in a place segregated from other manufacturing activities.

(15) Explosion vent shall be so installed that release takes place at safe location.

(16) The heater oil shall be subjected to pressure test by competent person once at least in every 12 months. The test pressure shall not be less than twice the operating pressure.

(17) If repairs are carried out to the coil, it shall be tested before taking it into use.

(18) The thermic fluid shall conform to the specifications prescribed by the manufacturer and shall be tested by competent person for suitability at least once in every three months period. Such tests shall include test for acidity, suspended matter, ash contents, viscosity and flash point.

(19) Cleaning of the internal surface of the heater or soot and check up of refractory surface on the inside shall be carried out every month or as often as required depending upon working conditions. The coils shall be removed and surface of the coils cleaned thoroughly once at least in a period of six months. The burner, nozzles, oil filters and pumps shall be cleaned once a week during the period of use.

(20) A separate register containing the following information shall be maintained,-

(a) weekly checks carried out confirming the effectiveness of the interlock;

(b) weekly checks confirming that all accessories are in good state of repairs; and

(c) information regarding fuel oil temperature, pressure, thermic fluid inlet/outlet pressure and temperature, fuel gas temperature, recorded at 4 hourly interval.

(21) The heater when in operation shall always be kept in charge of a trained operator.

60. RECORD KEEPING & ANNUAL REVIEW.-Each factory shall maintain a record of field equipment failures and Failure Mode, Effect & Criticality Analysis in prescribed Forms 7 & 8 respectively. This data and analysis shall be used for preparation of preventive maintenance schedules and prevention of potential hazards. In addition, the factory shall conduct an annual review of unusual occurrences and accidents occurred and submit the report to the Competent Authority.

61. COLOUR CODING OF SERVICE LINES.-

(1) Pipelines for water, air, oil and gases shall be colour coded as per Indian Standard: 2379-1963 & Indian Standard: 5-1978.

(2) Electrical conduit panels shall be colour coded as per Indian Standard: 375-1951 & Indian Standard: 5-1978.

62. HAZARDOUS CHEMICALS.- The occupier of every factory involving hazardous process shall fill the Form 9 entitled `Material Safety Data Sheet' and inform all employees of the factory, and the Competent Authority about the hazards involved. The Competent Authority may, on the basis of Material Safety Data Sheet mentioned above direct the Manager in writing to supply the workers exposed to particular hazard any necessary personal protective equipment conforming to relevant Indian Standards and prescribe the information and manner in which this information is to be passed on to the general public residing in the vicinity of the factory.

Rule 63

CHAPTER V

WELFARE

63. WASHING FACILITIES.-

(1) There shall be provided and maintained, in every factory for the use of employed persons adequate and suitable facilities for washing which shall include soap and nail brushes or other suitable means of cleaning and the facilities shall be conveniently accessible and shall be kept in a clean and orderly condition.

(2) Without prejudice to the generality of the foregoing provisions, the washing facilities shall include-

(a) a trough with taps or jets at intervals of not less than 60 cm.; or

(b) wash basins with taps attached there to;or

(c) taps on stand-pipes; or

(d) showers controlled by taps; or

(e) circular troughs of fountain type:

Provided that the Inspector may having regard to the needs and habits of the workers, fix the proportion in which the aforementioned types of facilities shall be installed.

(3) (a) Every trough and basin shall have a smooth, impervious surface and shall be fitted with a waste-pipe and plug.

(b) The floor or ground under and in the immediate vicinity of every trough, tap, jet, wash-basin, stand-pipe, and shower shall be so laid or finished as to provide a smooth impervious surface and shall be adequately drained.

(4) For persons whose work involves contact with any injurious or noxious substance there shall be at least one tap for every fifteen persons, and for persons whose work does not involve such contact the number of taps shall be as prescribed in the Schedule given below.

SCHEDULE

Number of workers	Number of taps
(1)	**(2)**
Up to 20	1
21 to 35	2
36 to 50	3
51 to 150	4
151 to 200	5

(1)	(2)
Exceeding 200 but not exceeding 500	5 plus one tap for every 50 or fraction of 50
Exceeding 500	11 plus one tap for every 100 or fraction there of 100

(5) If female workers are employed, separate washing facilities shall be provided and so enclosed or screened that the interiors are not visible from any place where persons of other sex work or pass. The entrance to such facilities shall bear conspicuous notice "For Women Only" in the language understood by the majority of the workers and shall also be indicated pictorially.

(6) The water supply to the washing facilities shall be capable of yielding at least 27 litres a day for each person employed in the factory and shall be from a source approved in writing by the Medical Officer if the source of supply is not the same as for drinking water:

Provided that where the Competent Authority is satisfied that such an yield is not practicable he may by certificate in writing permit the supply of a smaller quantity not being less than 5 litres per day for every person employed in the factory.

64. FACILITIES FOR KEEPING CLOTHING.- All classes of factories mentioned in the Schedule to this rule shall provide facilities for keeping clothing not worn during working hours. Such facilities shall include the provision of arrangements approved by the Competent Authority. The Competent Authority shall have powers to add other factories under the Schedule given below:-

SCHEDULE

Chemical works.

Engineering workshops.

Glass works.

Automobile workshops.

Power Plants.

5. FIRST-AID AND FIRST-AID APPLIANCES.- The first-aid oxes or cupboards shall be distinctively marked with a red cross on white background and shall contain the following equipments, namely :-

(1) The manager of the factory shall lay down procedures for First-Aid and medical services

so that injured or ill person receives prompt attention or aid. The person here means, a worker of the factory, contractor's labour or even a visitor.

(2) For factories in which the number of persons employed does not exceed ten, or in the case of factories in which mechanical power is not used & the number of persons does not exceed fifty each first-aid box or cupboard shall contain the following equipments, namely:-

(a) Six small size sterilised dressings.

(b) Three medium size sterilised dressings.

(c) Three large size sterilised dressings.

(d) Three large size sterilised burn dressings.

(e) One (60 ml) bottle of centrimide solution (1%) or a suitable antiseptic solution.

(f) One (60 ml) bottle of mercury chrome solution (2%) in water.

(g) One (30 ml) bottle containing sal-volatile having the dose and mode of administration indicated on the label.

(h) One pair of scissors.

(i) One roll of adhesive plaster (2 cm X 1 m).

(j) Six pieces of sterilised eye pads in separate sealed packets.

(k) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(l) Polythene wash bottle (1/2 litre, i.e. 500 cc) for washing eyes.

(m) A snake-bite lancet.

(n) One (30 ml) bottle containing potassium permanganate crystals.

(o) One tourniquet.

(p) A supply of suitable splints, and

(q) One copy of First-Aid leaflet issued by the Competent Authority.

(3) For factories in which mechanical power is used and in which the number of persons employed exceeds ten but does not exceed fifty, each first-aid box or cupboard shall contain the following equipments, namely:-

(a) Double of the quantity as indicated in respect of items (a) to (g) of sub-rule (2) above.

(b) Six (15 gms) packets of sterilized cotton wool.

(c) One pair of scissors.

(d) Two rolls of adhesive plaster (2 cm X 1 m).

(e) Eight pieces of sterilized eye pads in separate sealed packets.

(f) One tourniquet.

(g) A supply of suitable splints.

(h) One dozen safety pins.

(i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(j) One polythene wash bottle (1/2 litre i.e., 500 cc) for washing eyes.

(k) A snake-bite lancet.

(l) One(30 ml) bottle containing potassium permanganate crystals.

(m) One copy of the first-aid leaflet issued by the Competent Authority.

(4) For factories employing more than fifty persons, each First-Aid box or cupboard shall contain the following equipments, namely:-

(a) Double of the quantity as indicated in respect of items (a) to (e) of sub-rule (2) above.

(b) One (200 ml) bottle of centrimide solution(1%) or a suitable antiseptic solution.

(c) One (200 ml) bottle of mercury chrome (2%) solution in water

(d) One (120 ml) bottle of sal-volatile having the dose and mode of administration indicated on the label.

(e) One pair of scissors.

(f) One roll of adhesive plaster (6 cm X 1 m).

(g) Two rolls of adhesive plaster (2 cm X 1 m).

(h) Twelve pieces of sterilized eye pads in separate sealed packets.

(i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(j) One polythene wash bottle (500 cc) for washing eyes.

(k) Twelve roller bandages 10 cm wide.

(l) Twelve roller bandages 5 cm wide.

(m) Six triangular bandages.

(n) One tourniquet.

(o) A supply of suitable splints.

(p) Two packets of safety pins.

(q) Kidney tray.

(r) A snake-bite lancet.

(s) One(30 ml) bottle containing potassium permanganate crystals.

(t) One copy of first-aid leaflet issued by the Competent Authority:

Provided that items (j) to (q) inclusive, need not be included in the standard first-aid box or cupboard where there is a properly equipped ambulance room, or if at least one box containing such items placed and maintained in accordance with the requirements of section 45 is separately provided:

Provided further that the medical officer of the factory may alter the type and quantity of the contents at his discretion. The list of contents shall, however, be pasted inside the first aid box.

(5) In lieu of the dressings required under items (a) and (b), these may be substituted by adhesive wound dressings approved by the Competent Authority and other equipment or medicines that may be considered essential and recommended by the Competent Authority from time to time.

66. NOTICE REGARDING FIRST-AID.- A notice containing the names of the persons working within the precincts of the factory who are trained in first-aid treatment and who are in charge of the first-aid boxes or cupboards shall be posted in every factory at a conspicuous place and near each such box or cupboard. The notice shall also indicate workroom where the said person shall be available. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.

67. AMBULANCE ROOM.-

(1) Every ambulance room shall be under the charge of at least one whole-time qualified medical practitioner (hereinafter referred to as medical officer) who shall be assisted by at least one qualified nurse or dresser-cum-compounder and one nursing attendant in each shift. The medical officer shall be readily available on call during working hours of the factory:

Provided that where a factory works in more than one shift, the Competent Authority, if it is satisfied that on account of the size of the factory, nature of hazards or frequency of accidents, it is necessary to employ a whole time medical officer for each shift separately, may, order so in writing.

(2) There shall be displayed in the ambulance room a notice giving the name, address and telephone number of the medical practitioner in charge. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.

(3) No medical officer shall be required or permitted to do any work which is inconsistent with or detrimental to his responsibilities under this rule.

(4) The ambulance room shall be separate from the rest of the factory and shall be used only for the purpose of first-aid treatment and rest. It shall have a floor area of at least 24 sq.m. and smooth, hard and impervious walls and floors, and shall be adequately ventilated and lighted by both natural and artificial means. There shall be attached to it at least one latrine & urinal of sanitary type. An adequate supply of wholesome drinking water shall be laid on and the room shall contain at least the following, namely:-

(a) A glazed sink with hot and cold water always available.

(b) A table with a smooth top at least 180 cm X 105 cm.

(c) Means for sterilizing instruments.

(d) A couch.

(e) Two stretchers.

(f) Two buckets or containers with close fitting lids.

(g) Two rubber hot water bags.

(h) A kettle and spirit stove or other suitable means of boiling water.

(i) Twelve plain wooden splints 900 mm X 100 mm X 6 mm.

(j) Twelve plain wooden splints 350 mm X 75 mm X 6 mm.

(k) Six plain wooden splints 250 mm X 50 mm X 12 mm.

(l) Six woolen blankets.

(m) Three pairs of artery forceps.

(n) One bottle of spiritus ammoniac aromaticus (120 ml)

(o) Smelling salts (60 gm).

(p) Two medium size sponges.

(q) Six hand towels.

(r) Four "Kidney" trays.

(s) Four cakes of toilet, preferably antiseptic soap.

(t) Two glass tumblers and two wine glasses.

(u) Two clinical thermometers.

(v) Two tea spoons.

(w) Two graduated (120 ml) measuring glasses.

(x) Two minim measuring glasses.

(y) One wash bottle (1000 cc) for washing eyes.

(z) One bottle (one litre) carbolic lotion 1 in 20.

(aa) Three chairs.

(bb) One screen.

(cc) One electric hand torch.

(dd) Four first-aid boxes or cupboards stocked to standards prescribed under(c)of rule 59.

(ee) An adequate supply of anti-tetanus toxiod.

(ff) Injections - morphia, pethidrine, atropine, adrenaline, coramine, novocain (6 each).

(gg) Coramine liquid (60 ml).

(hh) Tablets -25 each of antihistaminic, antispasmodic.

(ii) Syringes with needles - 2 cc, 5 cc, 10 cc and 50 cc.

(jj) Three surgical scissors.

(kk) Two needle holders, big and small.

(ll) Suturing needles and materials.

(mm) Three dissecting forceps.

(nn) Three dressing forceps.

(oo) Three scalpels.

(pp) One stethoscope.

(qq) Rubber bandage - pressure bandage.

(rr) Oxygen cylinder with necessary attachments.

(5) The occupier of every factory to which these rules apply shall for the purpose of removing serious cases of accidents or sickness, provide in the premises and maintain in good condition a suitable conveyance unless he has made arrangements for obtaining such a conveyance from a hospital.

(6) The Competent Authority may, by an order in writing exempt any factory from the requirements of this rule, subject to such conditions as it may specify in that order, if a hospital, ambulance room or dispensary is maintained at or within 200 m. of the precincts of the factory and such arrangements are made as to ensure the immediate treatment of all injuries sustained by workers within the factory and for providing rest to the workers so injured.

Explanation:- For the purpose of this rule, "qualified medical practitioner" means a person holding a qualification granted by an authority specified in the schedule to the Indian Medical Degrees Act, 1916 (7 of 1916), or in the schedules to the Indian Medical Council Act, 1956 (102 of 1956).

68. CANTEENS.-

(1) The occupier of every factory where in more than two hundred and fifty workers are ordinarily employed shall provide in or near factory an adequate canteen according to standard prescribed in these rules.

(2) The canteen building shall be situated not less than 15 meters from any boiler house, coal stacks, ash dumps and any other source of dust, smoke or obnoxious fumes:

Provided that the Competent Authority may in any particular factory relax the provisions of this sub-rule to such an extent as may be reasonable in the circumstances and may require measures to be adopted to secure the essential purpose of this sub-rule.

(3) The canteen building shall be constructed in accordance with the plans and shall accommodate at least a dining hall, kitchen, store room, pantry and washing places separately for workers and for utensils.

(4) In a canteen the floor and inside walls up to a height of 1.2 metres from the floor shall be made of smooth and impervious material; the remaining portion of the inside walls shall be made smooth by cement plaster or in any other manner.

(5) The doors and windows of a canteen building shall be of flyproof construction and shall allow adequate ventilation.

(6) The canteen shall be sufficiently lighted at all times when any persons have access to it.

(7) (a) In every canteen -

(i) all inside walls of rooms and all ceilings and passages and staircases shall be limewashed or colourwashed at least once in each year or painted once in three years dating from the period when last limewashed, colourwashed or painted, as the case may be;

(ii) all wood work shall be varnished or painted once in three years dating from the period when last varnished or painted; and

(iii) all internal structural iron or steel work shall be varnished or painted once in three years dating from the period when last varnished or painted:

Provided that inside walls of the kitchen shall be limewashed once every four months.

(b) Records of dates on which lime washing, colourwashing, varnishing or painting is carried out shall be maintained in the prescribed register (Form 2).

(8) The precincts of the canteen shall be maintained in a clean and sanitary condition. Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance. Suitable arrangements shall be made for the collection and disposal of garbage.

69. DINING HALL.-

(1) The dining hall shall accommodate at a time at least 30 per cent of the workers working at a time and shall be provided with adequate numbers of tables and chairs or benches:

Provided that, in any particular factory or in any particular class of factories, the Competent Authority may by a notification in this behalf alter the percentage of workers to be accommodated.

(2) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs, shall be not less than 1 sq.m per diner to be accommodated as prescribed in sub-rule (1).

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

70. EQUIPMENT.-

(1) There shall be provided and maintained sufficient utensils, crockery, cutlery, furniture and any other equipment necessary for the efficient running of the canteen. Suitable clean clothes for the employees serving in the canteen shall also be provided and maintained.

(2) The furniture, utensils and other equipment shall be maintained in a clean and hygienic condition. A service counter, if provided, shall have a top of smooth and impervious material. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

71. ANNUAL MEDICAL EXAMINATION.-

(1) Annual medical examination for fitness of each member of the canteen staff who handles foodstuffs shall be carried out by the factory medical officer or the Certifying Surgeon, which should include the following, namely:-

(a) routine blood examination;

(b) routine and bacteriological testing, of faeces and urine for germs of dysentery and typhoid fever; and

(c) any other examination including chest X-ray that may be considered necessary by the factory medical officer or the Certifying Surgeon.

(2) Any person who in the opinion of the factory medical officer or the certifying surgeon is unsuitable for employment on account of possible risk to the health of others, shall not be employed as canteen staff.

Rule 72

72. SHELTERS, REST ROOMS AND LUNCH ROOMS.-

(1) The shelters, or rest rooms and lunch rooms shall conform to the following standards, namely:-

(a) the building shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and walls to a height of 90 cm. shall be so laid or finished as to provide a smooth, hard impervious surface;

(b) the height of every room in the building shall be not less than 3.70 m from floor level to the lowest part of the roof and there shall be at least 1.10 sq.m of floor area for every person employed:

Provided that (i) workers who habitually go home for their meals during the rest periods may be excluded in calculating the number of workers to be accommodated, and (ii) in the case of factories in existence at the date of commencement of the Act, where it is impracticable owing to lack of space to provide 1.10 sq.m. of floor area for each person, such reduced floor area per person shall be provided as may be approved in writing by the Competent Authority;

(c) effective and suitable provision shall be made in every room for securing and maintaining adequate ventilation by the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting;

(d) every room shall be adequately furnished with chairs or benches with back-rest; and

(e) sweepers shall be employed whose primary duty it is to keep the rooms, building and precincts thereof in a clean and tidy condition.

(f) suitable provision shall be made in every room for supply of drinking water and facilities for washing.

(2) The lunch rooms shall -

(a) comply with the requirements laid down in clauses (a) to (f) of sub-rule (1), and

(b) be provided with adequate number of tables with impervious tops for the use of workers for taking food:

Provided that the Competent Authority may exempt any factory from the provisions of this rule subject to the provisions being complied by some other means.

73. CRECHES.-

(1) The creche shall be conveniently accessible to the mothers of the children accommodated therein and so far as is reasonably practicable it shall not be situated in close proximity to any part of the factory where obnoxious fumes, dust or odours are given off or in which excessively noisy processes are carried on.

(2) The building in which the creche is situated shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and internal walls of the creche shall be so laid or finished as to provide a smooth impervious surface.

(3) The height of the rooms in the building shall be not less than 3.70 m from the floor to the lowest part of the roof and there shall be not less than 2.00 sq.m of floor area for each child to be accommodated.

(4) Effective and suitable provision shall be made in every part of the creche for securing and maintaining adequate ventilation by the circulation of fresh air.

(5) The creche shall be adequately furnished and equipped and in particular there shall be one suitable cot or cradle with the necessary bedding for each child (provided that for children over two years of age it will be sufficient if suitable bedding is made available), at least one chair or equivalent seating accommodation for the use of each mother while she is feeding or attending to her child, and a sufficient supply of suitable toys for the older children.

(6) A suitably fenced and shady open air playground shall be provided for the older children:

Provided that the Competent Authority may by order in writing exempt any factory from compliance with this sub-rule if he is satisfied that there is not sufficient space available for the provision of such a play-ground.

74. WASHROOM.-

(1) There shall be in or adjoining the creche a suitable washroom for the washing of the children and their clothing. The washroom shall conform to the following standards, namely:-

(a) the floor and internal walls of the room to a height of 90 cm. shall be so laid or furnished as to provide a smooth impervious surface. The room shall be adequately lighted and ventilated and the floor shall be effectively drained and maintained in a clean and tidy condition;

(b) there shall be at least one basin or similar vessel for every four children accommodated in a creche at any one time together with a supply of water provided, if practicable, through taps from a source approved by the Health Officer. Such source shall be capable of yielding for each child a supply of at least 23 litres of water a day; and

(c) an adequate supply of clean clothes, soap and clean towels shall be made available for each child while it is in the creche.

(b) there shall be at least one basin or similar vessel for every four children accommodated in a creche at any one time together with a supply of water provided, if practicable, through taps from a source approved by the Health Officer. Such source shall be capable of yielding for each child a supply of at least 23 litres of water a day; and

(c) an adequate supply of clean clothes, soap and clean towels shall be made available for each child while it is in the creche.

(2) Adjoining the washroom referred to in sub-rule (1), a latrine shall be provided for the sole use of the children in the creche. The design of latrine and the scale of accommodation to be provided shall either be approved by the Public Health authorities or, where there is no such Public Health authority, by the Competent Authority.

75. SUPPLY OF MILK AND REFRESHMENT.-At least a quarter litre of clean pure milk shall be available for each child on every day if accommodated in the creche and the mother of such a child shall be allowed in the course of her daily work, four intervals of at least 15 minutes to feed the child. For children above two years of age there shall be provided in addition an adequate supply of wholesome refreshment.

76. CRECHE STAFF.- For each creche there shall be appointed a woman in-charge and an adequate number of female attendants to help the woman in-charge. No woman in-charge shall be appointed under this rule unless she possesses the qualifications prescribed for a midwife or produces a certificate that she has undergone training for a period of not less than 18 months in a hospital, maternity home or nursing home approved in this behalf by the Competent Authority or produces a certificate that she has received training for a pre-primary teacher in an institution approved by the State Government. The creche staff shall be provided with suitable clean clothes for use while on duty in the creche.

77. EXEMPTION FROM THE PROVISION OF CRECHE.-

(1) In factories where the number of married women or widows employed does not exceed 15 or where the factory works for less than 180 days in a calendar year, or where number of children kept in the creche was less than 5 in the preceding year, the Competent Authority may exempt such factories from the provisions of section 48 and the rules 73 to 76 made thereunder, if he is satisfied that alternate arrangements as stipulated under subrule (2) are provided by the factory.

(2) (a) The alternate arrangements required in sub-rule (1) shall include a creche building which has a minimum accommodation at the rate of 1.90 sq. m. per child and constructed in accordance with the plans approved by the Competent Authority.

(b) The creche building shall have -

(i) a suitable washroom for washing of the children and their clothing;

(ii) adequate supply of soap and clean clothes and towels; and

(iii) adequate number of female attendants who are provided with suitable clean clothes for use while on duty to look after the children in the creche.

(3) The exemption granted under sub-rule (1) may at any time be withdrawn by the Competent Authority if it finds after such enquiry as he may deem fit, that the factory has committed a breach of this rule.

78. WELFARE OFFICER.-

(1) Number of Welfare Officers.-

(a) The occupier of every factory employing between five hundred(500) and two thousand (2000) workers shall appoint at least one Welfare Officer, and where the number of workers exceeds 2000, there shall be an additional Welfare Officer for every additional 2000 workers or fraction thereof over 500. In a factory where both men and women workers are employed, the number of women Welfare Officers to be appointed shall be in proportion to the women workers employed provided that where the number of women employed is more than 100 and the total number of workers does not exceed 2500 an additional woman Welfare Officer shall be appointed.

(b) Where there are more than one Welfare Officer appointed, one of them shall be called the Chief Welfare Officer and the others Assistant Welfare Officers.

(2) Qualifications.- A person shall not be eligible for appointment as a Welfare Officer, unless he -

(a) possesses a degree of a University recognised by the Government in this behalf;

(b) has obtained a degree or diploma in social science with specialization in industrial relations from any institution recognised by the Government in this behalf; and

(c) has adequate knowledge of the language spoken by the majority of the workers in the factory to which he is to be attached:

Provided that the Competent Authority, may by notification grant exemption from the provisions of clause (b) in suitable cases till such time as qualified persons are available:

Provided further that, in the case of a person who is acting as a Welfare Officer at the commencement of these rules, the Competent Authority may, subject to such conditions as it may specify, relax all or any of the aforesaid qualifications.

(3) Appointment of Welfare Officers.-

(a) The appointment of welfare officers shall be done as per the extant government procedures.

(b) The appointment when made shall be notified by the occupier to the Competent Authority or such authority as the Competent Authority may specify for the purpose, giving full details of the qualifications, etc. of the officer appointed and the conditions of his service.

(4) Conditions of service of Welfare Officers.-

(a) A Welfare Officer shall be given appropriate status corresponding to the status of the other executive heads of the factory and he shall be started on a suitable scale of pay equivalent to that of group B officer, the minimum of which shall not be less than Rs.2000/- per month.

(b) The conditions of service of a Welfare Officer shall be the same as of other members of the staff of corresponding status in the factory.

(5) Duties of Welfare Officer.- The duties of a Welfare Officer shall be -

(a) to establish contacts and hold consultations with a view to maintaining harmonious relations between the factory management and workers;

(b) to bring to the notice of the factory management the grievances of workers, individual as well as collective, with a view of securing their expeditious redress and to act as a liaison officer between the management and labour;

(c) to study and understand the point of view of labour in order to help the factory management to shape and formulate labour policies and to interpret these policies to the workers in a language they can understand;

(d) to watch industrial relations with a view of using his influence in the event of a dispute between the factory management and workers and to help to bring about a settlement by persuasive effort;

(e) to advise on fulfillment by the management and the concerned departments of the factory of obligations, statutory or otherwise, concerning regulation of working hours, maternity benefit, medical care, compensation for injuries and sickness and other welfare and social benefit measures;

(f) to advise and assist the management in the fulfillment of its obligations, statutory or otherwise, concerning prevention of personal injuries and maintaining a safe work environment, in such factories where a Safety Officer is not required to be appointed under the enabling provisions under section 40 B;

(g) to promote relations between the concerned departments of the factory and workers which will bring about productive efficiency as well as amelioration in the working conditions and to help workers to adjust and adapt themselves to these working environments;

(h) to encourage the formation of Works and Joint Production Committees, Co-operative Societies and Welfare Committee, and to supervise their work;

(i) to encourage provision of amenities such as canteens, shelters for rest, creches, adequate latrine facilities, drinking water, sickness and benevolent scheme payments, pension and superannuation funds, gratuity payments, granting of loans and legal advice to workers;

(j) to help the factory management in regulating the grant of leave with wages and explain to the workers the provisions relating to leave with wages and other leave privileges and to guide the workers in the matter of submission of application for grant of leave for regulating authorised absence;

(k) to advise on provision of welfare facilities, such as housing facilities, foodstuffs, social and recreational facilities, sanitation, advice on individual personnel problems and education of children;

(l) to advise the factory management on questions relating to training of new starters, apprentices, workers on transfer and promotion, instructors and supervisors, supervision and control of notice board and information bulletins to further education of workers and to encourage their attendance at technical institutes; and

(m) to suggest measures which will serve to raise the standard of living of workers and in general promote their well- being.

(6) Welfare Officers not to deal with disciplinary cases or appear on behalf of the management against workers.- No Welfare Officer shall deal with any disciplinary cases against workers or appear before a conciliation officer in a court or tribunal on behalf of the factory management against a worker or workers.

(7) Powers of exemption.- The Competent Authority may, by notification exempt any factory or class or description of factories from the operation of all or any of the provisions of this chapter, subject to compliance with such alternative arrangements as may be approved by such Competent Authority.

Rule 88 (Sch. -X)

SCHEDULE X

FINISHING BY ABRASIVES PROPELLED BY COMPRESSED AIR/STEAM

Cleaning or Smoothening, Roughening, etc., of Articles, by a Jet of Sand, Metal Shot, or Grit, or other Abrasive Propelled by a Blast of Compressed Air or Steam:

1. Definition.- For the purposes of this Schedule

   (a) "blasting" means cleaning, smoothening, roughening, or removing of any part of the surface of any article by the use as an abrasive of a jet of sand, metal shot, or grit or other material, propelled by a blast of compressed air or steam;

   (b) "blasting enclosure" means a chamber, barrel, cabinet or any other enclosure designed for the performance of blasting therein;

   (c) "blasting chamber" means a blasting enclosure in which any person may enter at any time in connection with any work or otherwise; and

   (d) "cleaning of castings" where done as an incidental or supplemental process in connection with the making of metal castings, means the freeing of the casting from adherent sand or other substance and includes the removal of cores and the general smoothening of a casting, but does not include the free treatment.

2. Prohibition of sand blasting.- Sand or any other substance containing free silica shall not be introduced as an abrasive into any blasting apparatus and shall not be used for blasting:

   Provided further that no woman shall be employed or permitted to work at any operation of sand blasting.

3. Precautions in connection with blasting operations.-

   (a) Blasting shall not be done except in a blasting enclosure and no work other than blasting and any work immediately incidental thereto and clearing and repairing of the enclosure including the plant and appliances situated therein, shall be performed in a blasting enclosure. Every door, aperture and joint of blasting enclosure, shall be kept closed and air-tight while blasting is being done therein.

   (b) Blasting enclosure shall always be maintained in good condition and effective measures shall be taken to prevent dust escaping from such enclosure, and from apparatus connected therewith, into the air of any room.

   (c) There shall be provided and maintained for and in connection with every blasting enclosure, efficient apparatus for separating, so far as practicable, abrasive which has been used for blasting and which is to be used again as an abrasive, from dust or particles of other materials arising from blasting; and no such abrasive shall be introduced into any blasting apparatus and used for blasting until it has been so separated:

Provided that this clause shall not apply, except in the case of blasting chambers, to blasting enclosures constructed or installed before the coming into force of this schedule, if the Competent Authority is of opinion that it is not reasonably practicable to provide such separating apparatus.

(d) There shall be provided and maintained in connection with every blasting enclosure efficient ventilating plant to extract, by exhaust draught effected by mechanical means, dust produced in the enclosure. The dust extracted and removed shall be disposed of by such method and in such manner that it shall not escape into the air of any room; and every other filtering or settling device situated in a room in which persons are employed, other than persons attending to such bag or other filtering or settling device, shall be completely separated from the general air of that room in an enclosure ventilated to the open air.

(e) The ventilating plant provided for the purpose of sub-paragraph (d) shall be kept in continuous operation whenever the blasting enclosure is in use whether or not blasting is actually taking place therein, and in the case of a blasting chamber, it shall be in operation even when any person is inside the chamber for the purpose of cleaning.

4. Inspection and examination.-

(a) Every blasting enclosure shall be specially inspected by a competent person at least once in every week in which it is used for blasting enclosure, the apparatus connected therewith and the ventilating plant shall be thoroughly examined and in the case of ventilating plant, tested by a competent person at least once in every month.

(b) Particulars of the result of every such inspection, examination or test shall forthwith be entered in a register which shall be kept in Form 10 and shall be available for inspection by any workman employed in or in connection with blasting in the factory. Any defect found on any such inspection, examination or test this paragraph applies shall be deemed for the purposes of this Paragraph to have been constructed, reconstructed or converted for use as such after the making of this Schedule if the construction, reconstruction or conversion thereof was begun after the making of this Schedule.

5. Provision of protective helmets, gauntlets and overalls.-

(a) There shall be provided and maintained for the use of all persons who are employed in a blasting chamber, whether in blasting or in any work connected therewith or in cleaning such a chamber, protective helmets of a type approved by a certificate of the Competent Authority; and every such person shall wear the helmet provided for this use whilst he is in the chamber and shall not remove it until he is outside the chamber.

(b) Each protective helmet shall carry a distinguishing mark indicating the person by whom it is intended to be used and no person shall be allowed or required to wear a helmet not carrying his mark or a helmet which has been worn by another person and has not since been thoroughly disinfected.

(c) Each protective helmet when in use shall be supplied with clean and not unreasonably cold air at a rate of not less than 170 litres per minute.

(d) Suitable gauntlets and overalls shall be provided for the use of all persons while performing blasting or assisting at blasting, and every such person shall while so engaged, wear the gauntlet and overall provided.

6. Precautions in connection with cleaning and other work -

(a) Where any person is engaged upon cleaning of any blasting apparatus or blasting enclosure or of any apparatus or ventilating plant connected therewith or the surroundings thereof or upon any other work in connection with any blasting apparatus or blasting enclosure or with any apparatus or ventilating plant connected therewith so that he is exposed to the risk of inhaling dust which has arisen from blasting, all practicable measures shall be taken to prevent such inhalation.

(b) In connection with any cleaning operation referred to in paragraph 5, and with the removal of dust from filtering or settling devices all practicable measures shall be taken to dispose of the dust in such a manner that it does not enter the air of any room. Vacuum cleaners shall be provided and used wherever practicable for such cleaning operations.

7. Storage accommodation for protective wear.- Adequate and suitable storage accommodation for the helmets, gauntlets and overalls required to be provided by paragraph 5 shall be proved outside and conveniently near to every blasting enclosure and such accommodation shall be kept clean. Helmets and overalls when not in actual use shall be kept in this accommodation.

8. Maintenance and cleaning of protective wear.- All helmets, gauntlets, overalls and other protective devices or clothings provided and worn for the purposes of this schedule, shall be kept in good condition and so far as is reasonably practicable shall be cleaned on every weekday in which they are used. Where dust arising from the cleaning of such protective clothing or devices is likely to be inhaled, all practicable measures shall be taken to prevent such inhalation. Vacuum cleaners shall, wherever practicable, be used for removing dust from such clothing and compressed air shall not be used for removing dust from any clothing.

9. Maintenance of vacuum cleaning plant.- Vacuum cleaning plant used for the purpose of this schedule shall be properly maintained.

10. Medical facilities and records of examinations and tests.-

(a) The occupier of every factory to which the Schedule applies, shall

(i) employ a qualified medical practitioner for medical surveillance of the workers employed therein, and whose

employment shall be subject to the approval of the Competent Authority; and

(ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (i) above.

(b) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Competent Authority which shall be kept readily available for inspection by the Inspector.

11. Medical examination by Certifying Surgeon.-

(a) Every worker employed in any of the processes to which this schedule applies shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function test and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

(b) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every 12 calendar months and such re-examination shall, wherever the Certifying Surgeon considers appropriate, include pulmonary function test and chest X-ray once in every three years.

(c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1 .The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory. The record of each examination carried under sub-paragraphs (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

(d) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Competent Authority.

(e) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents shall also include the period for which he considers that the said person is unfit for work in the said processes. The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

(f) No person who has been found unfit to work in the said processes as said in sub-paragraph (e) above shall be reemployed or permitted to work unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

Rule 88(Sch. X)

12. Power to exempt or relax.-

(a) If the Competent Authority is satisfied that in any factory or any class of factories, the use of sand or other substance containing free silica as an abrasive in blasting is necessary for a particular manufacture or process (other than the process incidental or supplemental to making of metal castings) and that the manufacture or process cannot be carried on without the use of such abrasive or that owing to the special conditions or special method of work or otherwise any requirement of this schedule can be suspended either temporarily or permanently, or can be relaxed without endangering the health of the persons employed or that application of any of such requirements is for any reason impracticable or inappropriate, it may, with the previous sanction of the Central Government, by an order in writing exempt the said factory or class of factories from such provisions of this schedule, to such an extent and subject to such conditions and for such period as may be specified in the said order.

(b) Where an exemption has been granted under sub-paragraph (a), a copy of the order shall be displayed at a notice board at a prominent place at the main entrance or entrances to the factory and also at the place where the blasting is carried on.

89. NOTIFICATION OF ACCIDENTS.-

(1) Where any accident specified in sub-para (a) of para 1 of the Schedule to this rule or any occurrences specified in para 2 of the said schedule takes place in a factory, the Manager of the factory, in which the accident occurred, shall within four hours of the happening of such accident or occurrence, send notice there of in Form 11 by telephone, telex, telegram or special messenger to the inspector and the Competent Authority and when the accident is fatal or it is of such a nature that it is likely to prove fatal, notice as aforesaid shall also be sent to-

(a) the District Magistrate or sub Divisional Magistrate;

(b) the Officer In Charge of the nearest Police Station;

(c) the Electrical Inspector (In case of electrical accident); and

(d) the relatives of the injured or deceased person.

(2) The notice so given shall be confirmed by the Manager of the factory to the above mentioned authorities within 12 hours of the accident/occurrence by sending a written report in Form 12 and in case of electrical accidents in Form 13 to the Electrical Inspector.

(3) When any accident of a minor nature specified in sub-para (b) of the said para 1 of the schedule takes place in a factory, the Manager of the factory shall within 24 hours after the expiry of the period specified in the said sub-para (b) , send notice thereof in the Form 11 to the medical officer; & the Competent Authority.

(4) If, in case of an accident, the injured person subsequently dies due to such accident, information of his death whenever known shall be sent by the Manager of the factory by telephone, telex, telegram or special messenger within 24 hours of the occurrence to-

(a) the District Magistrate or Sub-Divisional Magistrate;

(b) the Officer In Charge of the nearest Police Station;

(c) the Competent Authority; and

(d) the Electrical Inspector (In case of Electrical accidents).

EXPLANATION: Accident of serious nature means an accident which results in either or all of the following, namely:-

(i) Immediate loss of any part of the body or any limb or part there of;

(ii) Crushed or Serious injury to any part of the body due to which loss of the same is obvious or any injury which is likely to prove fatal;

(iii) Unconsciousness;

(iv) Severe burns or scalds due to chemicals, steam or any other cause; and

(v) Any injury to man/animal due to electrical energy.

(5) The Manager of the factory shall lay down the procedures for investigation of all accidents and occupational illnesses reported as per Forms 12 and 14.

SCHEDULE

1. (a) Accidents which cause death to any person or are of a serious nature.

(b) Accidents which cause such bodily injury as prevents or will probably prevent the person injured from working for a period of 48 hours or more immediately following the accident.

2. The following classes of occurrences, whether or not they are attended by personal injury or disablement:-

(a) Bursting of a vessel used for containing steam under pressure greater than atmospheric pressure, other than plant which comes within the scope of the Indian Boilers Act.

(b) Collapse or failure of a crane, derrick, winch, hoist or other appliances used in raising or lowering persons or goods or any part thereof, or the overturning of a crane.

(c) Explosion, fire, bursting out, leakage or escape of any molten metal, or hot liquor or gas causing bodily injury to any person or damage to any room or place in which persons are employed.

(d) Explosion of a receiver or container used for the storage at a pressure greater than atmospheric pressure of any gas or gases(including air) or a liquid or solid resulting from the compression of gas.

(e) Collapse or subsidence of any floor, gallery, roof, bridge, tunnel, chimney, wall or building, forming part of a factory or within the compound or curtilage of factory.

3. Leakage or release of effluents to the outside environment above those specified by the Department of Environment and Air and Water Pollution Control Boards.

90. NOTICE OF POISONING OR DISEASE. - A notice in Form 14 shall be sent with in four hours to the Competent Authority by the manager of the factory in which there occurs a case of poisoning or disease due to items mentioned in the Third Schedule of section 45 of the Factories Act, 1948(63 of 1948).

98. REGISTER OF ACCIDENTS AND DANGEROUS OCCURRENCES. - The manager of every factory shall maintain a register of all accidents and dangerous occurrences which occur in the factory. All these shall be investigated thoroughly and causes established. Any deficiency found in respect of systems & practices shall be corrected & report thereof shall be made available to the inspector & Competent Authority.

99. MAINTENANCE OF INSPECTION BOOK.- The manager of every factory shall maintain a register of inspection reports and shall produce it when so required by the Competent Authority or Certifying Surgeon.

101. COMMUNICATION FACILITIES.- The Manager shall establish effective communication facilities so that in the normal as well as in emergency conditions the Shift-in-charge is able to contact without delay the factory manager, control room, security, fire station, dispensary, workers and the outside agencies such as police, fire brigade, hospital, district magistrate, civil defence post.

102. SPECIAL POWERS OF THE COMPETENT AUTHORITY.- The Competent Authority shall have powers to notify specific safety procedures, guides, manuals to enhance safety & health in any factory.

Form - 1

CERTIFICATE OF FITNESS TO WORK ON SPECIFIED JOB

(See rules 7(3), 32 Sch. III, 33, 55, 88)

1. Name of the Factory:

2. Name of the Person

   (In Block letters) and Employee No.

   Sex: M/F Date of birth:

3. Educational Qualifications:

4. Previous Experience :

   Field of Experience :

5. Details of Medical Examination : Date

   .1. Height... .....cm. .2. Weight..... ...kg.

   .3. Hearing (Auditory Examination): Normal/Not normal*

   .4. Eyesight : Normal/Normal with spects/Not normal*

   : Colour blindness : Yes/No

   .5. General Laboratory Investigations (Blood, urine, excreta, sputum etc.): Normal/Not normal*

   .6. Pulmonary function & Chest Examination : Normal/Not normal*

   (including X ray examination)

   .7. Nervous system: Normal/Not normal*

   .8. Overall health assessment:

* Specify the condition & remedial measures.

6. I certify that I have personally examined Dr./Shri/Smt./Kum.. …..... . and seen his/her other medical reports and my recommendations are recorded below.

7.	Work with/in/at		Recommendations
.1.	Chemicals and hazardous materials including prescribed materials		Fit/Unfit
.2.	Machines		
	.2.1	Cranes	Fit/Unfit
	.2.2	Locomotives	Fit/Unfit
	.2.3	Fork lifts	Fit/Unfit
.3.	Blasting by compressed air/steam for cleaning of articles.		Fit/Unfit
.4.	Radioactive Area		Fit/Unfit
.5.	Any other work specified by the Competent Authority...		Fit/Unfit

Signature of Certifying Surgeon

Name ……...

Date: Reg.No. ..

Note: Strike out whichever is not applicable.

Medical Examination Record

S.No.	**Date of**		**Remarks**
-----	**Last Examination**	**Next Examination**	----------

Form - 1A

HEALTH REGISTER OF WORKERS EMPLOYED ON SPECIFIED JOBS

(See rules 7(4), 88)

Name of the Factory:

S.No.	Name	Age Yrs.	Nature of job	Date of Medical Exam.	Date of Employment in present work	Date of Learning or transfer to other work	If suspended from work period of suspension	Date of resumption of duty	Signature with date of certifying surgeon

N.B. Against column Nature of job please write the applicable number as given below:

(1) Working with Chemicals & Hazardous materials.

(2) Working with-2.1 rotating machines; 2.2 lifting machines; 2.3 material handling equipment.

(3) Working with -3.1 electrical work-low & medium voltage; 3.2 electrical work-high voltage.

(4) At height.

(5) At blasting by compressed air/steam for cleaning of articles.

(6) Radioactive area.

Form - 3

REPORT OF EXAMINATION OF HOISTS & LIFTS

(See Rule 34)

1. Name of the Factory :

2.1 Type of hoist or lift and identification No. or description :

2.2 Date of construction/reconstruction :

3. Are all parts of the hoist or lift, of good mechanical construction, sound material and adequate strength (so far as ascertainable) :

4. Are the following parts of the hoist or lift properly maintained and in good working order? If not, state what defects have been found. :

.1. Enclosure of hoistway or liftway :

.2. Landing gates and cage gate(s) :

.3. Interlocks and the landing gates and cage gate(s) :

.4. Other gate fastenings :

.5. Cage and platform and fittings, guides, buffers, interior of the hoistway or liftway. :

.6. Overrunning devices :

.7. Suspension ropes or chain and their attachments. :

.8. Safety gear i.e. arrangement for preventing fall of platform or cage brakes. :

.9. Brakes :

.10. Worm or spur gearing :

.11. Other electrical equipment :

.12. Other parts :

5. What parts(if any) were inaccessible :

6. Repairs, renewals :

7. Maximum safe work load :

8. Is any of the lift made as per requirements of fire lift & if so its location & identification No. :

9. Other particulars :

I/we certify that on (date) ... . I/we thoroughly examined this hoist or lift and that the above is a correct report of the result.

Signature:

Date: **Name :**

Form - 4

REPORT OF EXAMINATION OF LIFTING MACHINES

Ropes & Lifting Tackles

(See rule 35(4))

1.	Name of the Factory	:
2.	Distinguishing number or mark (if any) and description sufficient to identify the lifting machine, chains, rope or lifting tackle.	:
3.	Date when lifting machine chain, rope or lifting tackle was first used in the factory.	:
4.	Date and number of certificate of last examination made under section 29(1)a (iii) and by whom it was carried out.	:
5.	Date and number of certificate relating to any test & examination made, under rules 35.1 & 35.15 together with the name & address of the certifying person.	:
6.	Date & certificate of annealing or other heat treatment of the chain and lifting tackle carried out as per rule 35.7 and by whom it was carried out.	:
7.	Particulars of any defect found at any such examination or after annealing and affecting the safe working load and steps taken to remedy such defect.	:

I/We certify that on .....…….... I/We thoroughly examined the above mentioned lifting machine/chain rope/lifting tackle and that the above is a correct report of the result.

Signature:

Date: **Name:**

Form - 7

ITEM FIELD PERFORMANCE REPORT

(See rule 60)

1.	Name of the Factory		:
2.	Item		:
	.1	Identification	:
	.2	Manufacturer	:
	.3	Number of items of the type	:
	.4	Date of manufacture	:
	.5	Date of modification/reconditioning	:
	.6	Date first placed in use	:
	.7	Cumulative operating time since above	:
	.8	Date & place where used after 2.5	:
	.9	Date/ cumulative operating time since above	:
	.10	Cumulative time-Non use (Storage/Maintenance)	:
4.	Operating environment		:
	.1	Temperature Range	:
	.2	Relative humidity range	:
	.3	Nature of atmosphere A.C./Clean/Dusty/Corrosive/...	:
	.4	Vibration level	:
5.	Mode of operation Continuous/Intermittent/Standby/...		:

(2)

6.	Item failure information		:
	.1	Symptoms of failure	:
	.2	Failure detected during Operation / Periodic check / Preventive maintenance	:
	.3	Functions affected by failure	:
	.4	Failure cause	:
		Inherent/Misuse/ Maintenance induced/	:
		External to item/ Secondary/Unknown	:
7.	Item failure analysis and correction		:
	.1	List of failed parts	:
	.2	List of replaced parts	:
	.3	Adjustments made	:
8.	Total active downtime		:
9.	Total downtime		:
10.	Any other information		:

Signature:

Date:

Name :

Designation:

Form - 8

FAILURE MODE, EFFECT & CRITICALITY ANALYSIS

[F M E C A]

(See rule 60)

Name of the Factory:

System : ...

Sub System: ... Page _____of _____

Code No. : ...

No.	Part No.	Part		Failure Mode		Detection Method	Effect on System Plant	Remarks
		Name	Function	No.	Description			
1	2	3		4		5	6	7

Prepared By ... Checked By ... Approved By ...

Form - 11

PRELIMINARY REPORT OF ACCIDENT OR DANGEROUS OCCURRENCES

(See rules 89(1), 89(3))

1. Name of the Factory :
2. Name of injured person & address :
   Official :
   Residential :
3. a) Sex : M/F b) Age:
   c) Designation : d) Pay:
4. Date and hours of accident/dangerous occurrence :
5. Cause & Nature of accident/dangerous occurrence :

Date: **Manager** **Signature:**

Place: **Name :**

1. District/Sub Divisional Magistrate
2. Officer in charge of nearest police station
3. Inspector concerned.
4. Competent Authority.
5. Relatives of the injured/deceased.
6. Electrical Inspector.[In case of Electrical Accidents.]

In case of fatal accident or if it is of such a nature that it is likely to be

Form -12

NOTICE OF ACCIDENTS OR DANGEROUS OCCURRENCE

(See rules 89(2), 89(5))

1. Name of the Factory :

2. Branch or section & exact place where the accident or dangerous occurrence happened :

3. Name of injured person :

   Address Official :

   Residential :

4. a) Sex : M/F b) Age :

   c) Designation : d) Pay :

5. Date and hour of accident or dangerous occurrence :

6. Hours at which he started work on the day of accident :

7. a) Cause & nature of accident or dangerous occurrence :

   b) If caused by machinery :

      i) Name of the machine and part causing the accident, & :

      ii) Whether it was moved by mechanical power at that time : Yes/No

   c) Exactly what injured person was doing at that time :

8. Names & addresses of the witnesses to the accident : 1)

   : 2)

9. Nature & extent of Injury :

10. Period of disability :

(2)

11.	If accident is not fatal, state whether injured person is likely to be disabled for 48 hours or more	:	Yes/No
12.	Name of Medical Officer in attendance on injured person	:	

I certify that to the best of my knowledge and belief that the above particulars are correct in every respect.

Date: **Manager** **Signature :**

Place: **Name :**

Competent Authority.

Form - 13

FORM FOR REPORTING ELECTRICAL ACCIDENTS

(See rule 44-A of the Indian Electricity Rules,1956;

&

Atomic Energy (Factories)Rules, 1996; rule 89(2))

1.	Date and time of accident	:
2.	Place of accident and district	:
3.	System & Voltage of supply	:
4.	Name of the licensee or person/persons or supplier or user of energy in whose premises or jurisdiction the accident occurred	:
5.	a) (i) Name of the person	:
	(ii) Animal(please specify the name and address of the owner)	:
	b) Address of such/each person	:
6.	Occupation and designation of such person/persons (and in particular whether employed in electrical works or elsewhere)	:
7.	Brief description of the job undertaken, if any	:
8.	Authority under which such person / persons was / were allowed to work on the job. State also whether he/they was/were authorised person/persons	:
9.	Describe fully nature and extent of injuries, e.g. fatal, disablement of any portion of body or other injury, etc.	:
10.	Detailed causes leading to the accident	:
11.	Action taken regarding first aid, medical attendance, etc. immediately after the occurrence of the accident.	:
12.	Whether appropriate Govt. Dist. and police station informed (if so, give the address).	:

(2)

13.	Steps taken to preserve the evidence in connection with the accident to the extent possible.	:
14.	Name and designation/s of the person/s assisting the person/s killed or injured.	:
15.	What safety equipment were given to and used by the person/s who met with this accident(e.g. rubber gloves, rubber mats, safety belts and ladders, etc.).	:
16.	Whether isolating switches and other sectionalising devices were employed to deaden the sections for working on the same, if so, whether these were earthed.	:
17.	Whether the work on live lines was undertaken by an authorized person/s. If so, the name and designation of such person/s may be given.	:
18.	Whether artificial resuscitation treatment was given to the person who met with electric accident. If yes, for how long was it continued, before abandonment.	:
19.	Steps proposed to be taken to avoid recurrence	:
20.	Names and designations of persons present at the time of accident.	:
21.	Any other remarks	:

Date: **Manager** **Signature :**

Time: **Name:**

1. Electrical Inspector of the region.

2. Competent Authority.

Form - 14

Notice of Poisoning or Disease

(See rules 89(5), 90)

1.	Name of the Factory		:	
2.	Name and address of the undertaking in which the patient presumes that he was exposed to the risk to which the poisoning or disease is attributed.		:	
3.	Harmful agent or process		:	
4.	Patient.	Name	:	
		Address	:	
5.	1. Sex : M/F		2. Age :	
	3. Designation:		4. Pay :	
6.	Precise occupation of the patient		:	
	.1 at the place or last place of employment		:	
	.2 at the undertaking in which the patient presumes that he was exposed to the risk.		:	
7.	Nature of poisoning or disease.		:	
8.	Approximate dates of beginning & cessation of exposure of the patient to the harmful agent or process mentioned in 3 above.		:	
9.	General particulars		:	

Manager, **Signature:**

Date: **Name:**

Competent Authority.