DELHI STATE INDUSTRIAL AND INFRASTRUCTURE DEVELOPMENT CORP. LTD

NIT NO.:16 /2008-09

FINANCIAL BID DOCUMENT

NAME OF WORK: **Integrated Infrastructure Development of Delhi Govt.Schools**

SUB HEAD : **IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East Districts (Composite Work).**

INDEX

This Financial bid contains 1 to 223 pages in chronological order.
including _ _____Nil_____ correction slips

EXECUTIVE ENGINEER (CD)-XX
DSIIDC, DELHI

1.0 CHECK LIST FOR CONTRACTORS FOR SUBMISSION OF FINANCIAL BID

TENDERERS TO ENSURE THAT :-

1. This financial bid documents shall be submitted along with Technical Bid in separate sealed envelope.
2. Tender to be witnessed on page 8 of tender documents.
3. Rates must be filled both in words and figures (numericals). Total amount shall be worked out and grand total arrived at.
4. The contractor shall quote this rates keeping in mind the specifications, terms and conditions, additional/particular and special conditions etc. and no thing shall be payable extra whatsoever, unless otherwise specified.
5. The contractor shall have to execute guarantee bonds for removal of defects after completion in respect of water proofing, sanitary installations/water supply /drainage works/ stone work/ tile work.
6. The contractor shall also furnish performance guarantee of 5% of the tendered amount in addition to the other deposits mentioned elsewherein the contract for proper performance of the agreement. The performance guarantee shall be in the shape o f FDR or bank guarantee as per performa given.
7. Security deposit @ 5% of the actual cost of work done for various specialized works under the sub-heads such as water proofing works. Water supply and sanitary installation etc. shall be retained in addition to guarantee bond at the time of release of security deposit, for 10 years & 5 years to be reckoned from the date after the expiry of maintenance period prescribed in the contract for rectification of defects respectively. However this amount can be releas ed if the contractor submits bank guarantee bond from scheduled bank for that amount.
8. Main civil contractor shall also execute the electrical works. He should be/either an eligible electrical contractor himself or associate with himself an 1 electrical co ntractor for execution of electrical work. Such electrical contractors obtain necessary license to work as electrical contractors from competent authority of Delhi within a specified period of 30 days from award of work. The pre-requisites for electrical works shall be as per **Page No. 147 to 167 of part-B (Electrical)**.

D.S.I.I.D.C.-6

GOVERNMENT OF DELHI
DELHI STATE INDUSTRIAL AND INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

NOTICE INVITING TENDER

NOTICE INVITING TENDER

1. The Executive Engineer(CD-XX), DSIIDC on behalf of the Managing Director, DSIIDC invites sealed Item rate bids from firms / contractors of re pute in two envelope system for the following work :

Sl No	Name of work	Estimated Cost (Rs.in lacs)	Period of Comple -tion
1.	**Integrated Infrastructure Development of Delhi Govt.Schools SUB HEAD: Improvement and upgradation of 34 Government School Buildings in East and North East Districts (Composite Work).**	Civil works = 3276.10 Electrical work = 255.89 Total = 3531.99	Twelve months

2. Agreement shall be drawn with the suc cessful tenderer on prescribed Form No. D.S.I.I.D.C. -- 8. Tenderer shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

3. The time allowed for carrying out the work will be **Twelve Months (12 months)** from the tenth day (10^{th} Day) after the date of written order to commence the work of or from the first day of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender documents.

4. The site for the work is available.

5. Tender documents shall be issued from 30.01.2009 to 16.02.2009 between 11 AM and 4.00 PM, on working days.

6. Tender documents consisting of plans, specifications, the schedule of quant ities of the various classes of work to be done and the set of terms and conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen in the office of EE **(CD)-XX** between hours of 11 A.M. and 4.00 P.M. from 30.01.2009 to 16.02.2009 every day except on Sunday and public holidays. Tender documents, excluding standard form will be issued from the office of EE(CD)-XX during the hours specified above on payment of the following.

a) **Rs. 2500/-** in cash or DD (Non-refundable) as cost of tender.

b) Earnest Money of Rs**. 45.32 lacs** deposit at call receipt of a scheduled bank/ Fixed Deposit Receipt of a Scheduled Bank/Demand Draft of Scheduled Bank issued in favour of **EE(CD)-XX, DSIIDC** at the time of application of tender. Earnest money or Rs.20 lacs will have to be deposited in shape prescribed above and balance amount of earnest money in the form of bank guarantee of scheduled bank can be accepted. It should be ensured that the FDR/BG is valid for a period of 6 months or more after last date of receipt of tenders and is pledged in favour of the tender inviting authority.

7. Tender Submission

a) Technical and Financial bid volumes will be sealed separately and shall be placed in another sealed envelope with the name of work and due date written on the envelopes, will be received by **EE(CD)-XX, DSIIDC upto 3.00 P.M. on 24.02.2009** and will be opened by him or his authorised representative in the office of **EE (CD-XX) DSIIDC, Udyog sadan,419 FIE,Patpargan j, Delhi-110092 at 3.30 PM on** same day.

b) Pre bid conference shall be held at DSIIDC Business Centre, Baba Kharak Singh Marg (behind Delhi Emporium), Connaught Circus, New Delhi 110001 at 11 .30 AM on 19.02.2009.

c) No further conditions, if given by any ten derer with the submission of tender shall be accepted. The DSIIDC reserves the right not to consider such tenders which are found to contain such conditions, in contravention of the above.

8. The description of the work is as follows:

NAME OF WORK: Integrated Infrastructure Development of Delhi Govt.Schools

SUB HEAD : IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East districts of Delhi

The above description is tentative. The work shall however be executed as per Architectural, structural, service drawings etc. Copies of other drawings and documents pertaining to the works will be open for inspection by the tenderers at the office of EE(CD-XX). Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub - soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general, shall thems elves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequen t on any misunderstanding

or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for e xecuting the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and other factors having a bearing on the execution of the work.

9. The competent authority on behalf of the D.S.I.I.D.C.. does not bind himself to accept the lowest or any other tender, and reserves to himself the authority to reject a ny or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer, shall be summarily rejected. How ever, tenders with unconditional rebate shall be accepted

   The competent authority also reserves its right to allow to the Central Government public sector enterprises, joint venture with CPSE holding 51% equity or more, a purchase preference with reference to the lowest valid price bid where the quoted price is within 10% of such lowest price in a tender other things being equal in case of tenders/ quotations whose date of receipt is upto 31.03.2008 or extended date subject to the estimated cost being of Rs. Five crores and above.

   The Public enterprises who avail benefits of the purchase preference should be subjected to adequate penalties for cost overruns etc.

10. Canvassing, whether directly or indirectly, in connection with the tenders, is strictly prohibited and the tenders, submitted by the contractors, who resort to canvassing, will be liable to rejection.

11. The competent authority on behalf of D.S.I.I.D.C. reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

12. The contractor shall not be permitted to tender for works in the D.S.I.I.D.C.. Zone (responsible for award and execution of contract) in which his near relative is posted as J.A.O./A.A.O./A.O./Sr. A.O./C.A.O. or as an officer in any capacity between the grades of Chief Engineer and Junior Engineer (both inclusive) He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the D.S.I.I.D.C.. Ltd. Any breach of this condition by the contractor would render him debar for further tendering in D.S.I.I.D.C..

13. No Engineer of gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the D.S.I.I.D.C.. Ltd. is allowed to work as a contractor for a period of two years after the date of his retirement from DSIIDC services, without previous permission of the M.D., D.S.I.I.D.C.. Ltd. in w riting. The contract is liable to be cancelled if either the contractor or any of his employee is found any time to be such a person who had not obtained the permission of the D.S.I.I.D.C.. Ltd. as aforesaid before submission of the tender or engagement in the contractors services

14. The bids for the work shall remain valid for a period of 90 days (Ninety Days) from the date of opening of the tenders. If any tenderer withdraws his tender before the said period or issue of letter of acceptance, which ever is earlier or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then D.S.I.I.D.C.. shall, without prejudice to any other rights or remedy, be at liberty to forfeit 50% of the earnest money as aforesaid and to forfeit the whole of the Earnest Money if the tenderer fails to submit the Performance Guarantee in the prescribed time after the issue of the Letter of Acceptance

    In the event, the tenderer whose tender is accepted and the award letter issued after the receipt of the Performance Guarantee in the prescribed form and time, fails to commence the work "along with change in scope if any" in the prescribed time or abandons work before its completion, DSIIDC shall without prejudice to any right or remedy be at liberty to forfeit the whole of the Earnest Money and Performance Guarantee shall stand forfeited in full and shall be absolutely at the disposal of M.D., DSIIDC.

15. This Notice Inviting Tender shall form a part of the contract document. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work sign the contract consisting of
    a) The notice inviting tender all the document including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
    b) Standard D.S.I.I.D.C. Form 8 as per General conditions of contract with amendments upto date of receipt of tender.

16. The contractor shall have to execute the Electrical Work also. He should be either an elegible electrical contractor himself or associate himself with an elegible electrical contractor for Execution of Electrical Works. The eligible contractor shall be enlisted in appropriate class with CPWD, Dept of Telecom, DDA, Railways, NDMC, MCD, ro state PWD of any state provided such electrical contractors obtain necessary license to work as Electrical Contractors from competent authority within a specified period of 30 days from date of award of work.The pre-requisite for Electrical work shall be as per Page 124 to 125 of Part B of Electrical.

17. The tenderer must associate with himself agencies of the appropriate class eligible to tender for the other components individually.

18. It will be obligatory on the part of the tenderer to sign the tender documents for all the components. (The schedule of quantities, conditions and special conditions etc.)

19. The Executive Engineer in charge of the major component called the tenders for this composite work. The cost of tender document and Earnest money will be fixed with respect to the combined estimated cost put to tender for the composite tender. Security deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works. The Earnest money will become part of the security deposit of the major component of work.

20. On acceptance of the composite tender by the competent authority the letter of award will be issued by the Executive Engineer in charge of the major component on behalf of MD, DSIIDC, making it clear in the letter of acceptance that the contractor will have to execute

separate agreements for electrical components of work with concerned Ex. Engineer(Elect.).

21. The contractor should have registration certificate under Delhi Value Added Tax 2004 and also should have valid No Dues Certificate.

22. The department should deduct Works Contract Tax/VAT/Income Tax and 1% Labour cess for labour welfare fund on the value of works done from each bill of the contractor as per prevailing DSIIDC instructions/orders. In lieu, the Department shall issue a certificate of deduction of the tax at source to the contractor in relevant forms .

23. The main agency shall be responsible for acts of commission and non -commission of the electrical contractor associated by him as per the above conditions.

24. Final bill of Civil and Electrical component shall be paid by Executive Engineer(Civil).

25. If any tenderer submits false information and/or documents his EMD shall be forfeited and he will be debarred for future tendering in DSIIDC for a period of two years.

26. The tenderer whose tender is accepted will have to deposit 5% of the awarded amount as performance security in treasury challan/ Deposit at Call receipt of a Scheduled Bank / Fixed Deposit Receipt of a Scheduled Bank/ Demand Draft of Scheduled Bank issued in favour of DSIIDC Ltd. Within 15 days of the issue/ acceptance of the intent letter. This period can be further extended for a maximum period of 7 days on written request of contractor.

27. The quantities mentioned against individual schools as per Annexure -I & II are tentative and can vary on either side depending on site conditions, no claim on this account shall be entertained.

_____

Signature of Divisional Officer/Sub Divisional Officer
For & on behalf of M.D. DSIIDC.

D.S.I.I.D.C..-8

GOVERNMENT OF DELHI

DELHI STATE INDUSTRIAL AND INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

STATE	-	DELHI	CIRCLE	-	SE (HQ)
BRANCH	-	D.S.I.I.D.C.	DIVISION	-	EE(CD) - **XX**
ZONE	-	WORKS DIVISION			

Item Rate Tender & Contract for Works

A) Tender for the work of:

Name of work: **Integrated Infrastructure Development of Delhi Govt.Schools**

SUB HEAD : IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East Districts (Composite Work).

i) To be submitted by 3.00 PM.on 24.02.2009 in the office of EE(CD)-XX, DSIIDC Udyog Sadan,419 FIE,Patparganj, Delhi -110092.

ii) To be opened in presence of tenderers who may be present at 3.30 P.M on 24.02.2009 in the office of **EE (CD)-XX**

Issued to _____
(Contractor)

Signature of officer issuing the documents_____

Designation : EE (CD)-XX

Date of Issue _____

TENDER

1. I/We have read and examined the notice inviting tender, schedule A,B,C,D,E & F, specifications applicable, Drawings and Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, S chedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

2. I/We hereby tender for the execution of the work specified for the M.D., D.S.I.I.D.C.. within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs , drawings and instructions in writing referred to Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

3. We agree to keep the tender open for ninety (90) days from the date of receipt of tender thereof and not to make any modifications in its terms and conditions.

4. A sum of Rs 45.32 lacs has been deposited with DSIIDC in Treasury Challan/ Deposited at call receipt of scheduled bank / Fixed deposit receipt of scheduled bank/ demand draft of a scheduled bank as earnest money. If I/We fai l to furnish the prescribed performance guarantee within prescribed, period, I/We agree that the said M.D., D.S.I.I.D.C.. or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money ab solutely. Further if/ I/We fails to commence the work as specified, I/We agree that M.D. DSIIDC or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and performance guarantee otherwise the said earnest money shall be retained by him towards security deposit/ to execute all the works referred to in the tender documents upon the terms and conditions contained on referred to there in and to carry out such deviations as may be ordered, upto the maximum of the percentage mentioned in schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provisions contained in clause 12.2 and 12.3 of the tender form. .

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

Dated:_____ Signature of Contractor

Witness: Postal Address
Address:
Occupation

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the M.D., D.S.I.I.D.C. for a sum of Rs……. (Rupees……..)

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

i)

ii)

iii)

For & on behalf of the M.D., D.S.I.I.D.C.

Signature……..

Designation ……..

Dated:……

SCHEDULES

SCHEDULE 'A'

Schedule of quantities (Enclosed) Page 18 to 121

SCHEDULE 'B'

Schedule of materials to be issued to the contractor

S.No.	Description of Item	Quantity	Rates in figures & words at which the materials will be charged to the contractor.	Place of Issue
1	2	3	4	5
Nil	Nil	Nil	Nil	Nil

All material to be arranged by Contractor

SCHEDULE 'C'

Tools and plants to be hired to the contractor

S. No.	Description	Hire charges per day	Place of Issue
1	2	3	4

…….Shall be arranged by the contractor…….

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any

1. **Amendments! Changes in Clauses of the General Conditions of Contract**
2. **General specifications and General Conditions**
3. **Special Conditions for cement & steel to be arranged by the C ontractor**
4. **Particular Specifications (Civil works)**
5. **Special Conditions (Civil Work)**
6. **Special Specifications (RCC Rehabilitation)**
7. **List of approved vendors / preferred makes(Civil Work)**
8. **Guarantee to be executed by the contractor for removal**

   Of defects after completion in respect of stone/tile work
9. **Guarantee to be executed by the contractor for removal**

   Of defects after completion in respect of sanitary

   installation/water supply work
10. **Performance Bank Guarantee**
11. **Additional Specifications & conditions (Electrical Works)**
12. **Technical Specifications for Electrical Work**
13. **Technical Specifications (Internal Wiring)**
14. **List of approved make (Electrical Work)**
15. **Pre-Requisites for Electrical Work**
16. **Guarantee Bonds**

SCHEDULE 'E'

Schedule of component of Cement, Steel, Other Materials, Labour etc. for price escalation.

CLAUSE 10 CC **Deleted**

Component of Cement - Expressed as percent of total value of work.	**Xc**	**_____%**
Component of Steel- Expressed as percent of total value of work.	**Xs**	**_____%**
Component of civil (except cement & steel - /Electrical construction Materials expressed As percent of total value of work.-	**Xm**	**_____%**
Component of Labour- Expressed as percent of total value of work.	**Y**	**_____%**
Component of P.O.L.- Expressed as percent of total value of work.	**Z**	**_____%**

SCHEDULE 'F'

Reference to General Conditions of contract.
General Conditions of Contract for DSIIDC Form – 8 with amendments issued upto receipt of tender

Name of work: Integrated Infrastructure Development of Delhi Govt.Schools

SUB HEAD: IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East Districts (Composite Work).

Estimated cost of work:	**Rs. 3276.10 (Civil work)**
	Rs. 255.89(Electrical work)
Total	**Rs. 3531.99 lacs**

Earnest money **Rs.45.32 lacs**

Performance Guarantee: **5% of the tendered amount**
Security Deposit: **5% of tendered amount**

General Rules & Directions:

Officer inviting tender **EE (CD)-XX, DSIIDC**

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with the clause 12.2 & 12.3 **As per clause 12.**

Definitions: -

2(i) Engineer-in-Charge for civil item of works **EE (CD)-XX**
2(ii) Engineer- in-charge for Eletrical item of works **EE (ED)-I**

2(iii) Accepting Authority **MD, DSIIDC**

2(iv) Percentage on cost of materials and labour to cover all overheads and profits. **15%**

2(v) Standard Schedule of Rates

Civil Item of works : DSR 2007 with upto date correction slip upto submission of tender

Electrical Item of Works : Do

2(vi) Department DSIIDC,

2(vii) Standard D.S.I.I.D.C. contract form 8 as modified & Form corrected upto date of tender

Clause 1

(i) Time allowed for submission of performance guarantee from the date of issue of letter of acceptance 15 days

(ii) Maximum allowable extension beyond the period Provided in (i) above in days 7 days

Clause 2

Authority for fixing compensation under clause 2 SE(HQ)

Clause 2 A
Whether Clause 2 A shall be applicable -Yes

Clause 5

No. of Days from the date of issue of letter of commencement for Reckoning date of start – tenth day

Table of Mile Stone (s)

S.No.	Financial Progress	Time Allowed (from date of start)	Amount to be withheld in case of non-achievement of mile stone
1.	1/8 (of the whole work)	1/4 (of the whole work)	In the event of not achieving of the necessary progress as assessed from the running payments, 1% of the tendered value of work will be with held for failure of each mile stone.
2.	3/8 (of the whole work)	½ (of the whole work)	
3.	¾ (of the whole work)	¾ (of the whole work)	
4.	Full	Full	

Time allowed for execution of work 12 Months

Authority to give fair and reasonable SE(HQ)

extension of time for completion of work

Clause 6, 6(A) — **Clause applicable**

Clause 7

Gross work to be done together with net payment/adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment. — **Rs.75 lacs or as mutually agreed**

Clause 10 (A) — **Applicable**

Clause 10 B (ii) — **Applicable**

Clause 10 C — **Not Applicable**

Clause 10 CA — **Applicable**

Material covered under this clause

1. **Cement**
2. **Reinforcement for RCC work**
3. **Steel- a) T- Iron for chaukhat**
   b) Angle iron & girder for roofing.

Clause 10 CC — **Not Applicable**

Clause 11

Specification to be followed for execution of Work

For Civil Works — **CPWD specification 1996 Vol. I to VI and revised CPWD specification 2002 for cement mortar, cement concrete & R.C.C. work in pursuance to I.S. 456-2000 with upto date correction slips up to date of opening of tender.**

For Electrical Works — **CPWD specifications 2005 (internel) and 1995 (external)**

Clause 12

A) Deviation Limit beyond which clause — **30 %**

12.2 & 12.3 shall apply for Building works.

B) Deviation limit beyond which clause 12.2 & 12.3 shall apply for foundation works **100%**

Clause 16

Competent Authority for deciding reduced rates **SE(HQ), upto 5% of contract value for civil items of work and Dy.CE(E)/SE (E) for Electrical items of work**

Clause 18 - **Applicable**

Clause 36 (i)
Requirement of Technical Representative(s) and Recovery Rate

S.No.	Minimum Qualification of Technical Representative	Discipline	Designation	Minimum Experience	Number	Rate at which recovery shall be made from the Contractor in the event of not fulfilling provision of Clause 36 (i)	
						Figure Rs.	Words
1.	Project Manage with degree in Engg	Civil	Principal Technical representative	10 Years	One	25,000	Twenty Five thousand
2	Deputy Project Manager – Graduate Engineer	Civil	Technical Representativ	5 years	One	15,000	Fifteen Thousand
3	Deputy Project Manager – Graduate Engineer	Electrical	Technical Representativ	5 years	One	15,000	Fifteen thousand
4	Quality Control Engineer- Graduate Or Diploma holder	Civil and Electrical	Technical Representativ	Nil Or 5 years	Two (one each)	10,0000	Ten thousand

Clause 42

i)(a) Schedules/statements for determining theoretical quantity of cement and bitumen on the basis of Delhi Schedule of Rates printed by C.P.W.D.	**DSR 2007 with upto date correction slip up to date of the tender.**
ii) Variations permissible on theoretical quantities	
a) Cement	**2% plus/minus**
b) Bitumen for all works & nil on minus side	**2.5% plus only.**
c) Steel Reinforcement and structural steel Section for each diameter, section & Category	**2% plus/minus**

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

Sl. No.	Description of Items	Rate in figures and words at which recovery shall be made from the Contractor.	
		Excess beyond permissible variation	Less use beyond the permissible variation.
1.	Cement OPC conforming to IS: 8112-1989, grade 43 in HDPE bags (shall be arranged by the contractors at his own cost at site store)	--	Rs 10,000/- MT
2.	Steel reinforcement	--	Rs 9,000 /- QTL
3.	Structural Sections	---	Rs 9,500/-QTL

NAME OF WORK: INTEGRATED INFRASTRUCTURE DEVELOPMENT OF DELHI GOVT. SCHOOLS						
SH: IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in North East Districts (Composite Work)						
CIVIL TENTATIVE QTY. OF 34 SCHOOLS						
S.No.	**Description of Item**		**TOTAL QUANTITY**	**RATE**	**Unit**	**Amount (Rs.)**
		SUB HEAD 1 : EARTH WORK				
1		Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth upto 50 m and lift upto 1.5 m, disposed soil to be levelled and neatly dressed :				
	a)	All kinds of soil	**8082.0**		100sqm	
2		Banking excavated earth in layers not exceeding 20 cm. in depth, breaking clods, watering, rolling each layer with 1/2 tonne roller, or wooden or steel rammers, and rolling every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing up, in embankments for roads, flood banks, marginal banks, and guide banks etc., lead upto 50 m and lift upto 1.5 m.				
	a)	All kinds of soil	**1294.0**		cum	

3		Deduct for not rolling with power roller of minimum 8 tonnes for banking excavated earth in layers not exceeding 20 cm in depth.	**1294.0**		cum	
4		Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including disosal of excavated earth, lead upto 50 m and lift upto 1.5 m, disposed earth to be levelled and neatly dressed :				
	a)	All kinds of soil	**560.0**		cum	
5		Earth work in excavation by mechanical means(Hydraulic excavator)/manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
	a)	All kinds of soil	**9341.0**		cum	
6		Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m:				
		All kinds of soil				
	a)	Pipes, cables etc, not exceeding 80 mm dia	**1335.0**		metre	

	b)	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	**4779.0**		metre	
7		Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m	**10579.0**		cum	
8		Extra for every additional lift of 1.5m or part thereof in :				
	a)	All kinds of soil.	**319.0**		cum	
9		Supplying and filling in plinth with Jamuna sand under floors including, watering, ramming consolidating and dressing complete.	**1967.0**		cum	
10		Excavating holes upto 0.5 cum including getting out the excavated soil, then returning the soil as required in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering etc, disposing of surplus excavated soil; as directed within a lead of 50 m and lift upto 1.5 m:				
	a)	All kinds of soil	**5.0**		nos	
11		Supplying and stacking of good earth at site including royaltyand carriage upto any lead (earth measured in stacks will be reduced by 20% for payment)	**299.0**		cum	

12		Providing and laying in position autoclaved aerated concrete (BILT or equivalent) brocken blocks in layers including grouting the voids with cement mortar 1 :6 (1 cement:6 fine sand) upto all all floor levels complete	**133.3**		cum	
13		Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work upto plinth level.				
	a)	1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	**1209.5**		cum	
	b)	1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size)	**3155.0**		cum	
14		Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centring, shuttering and finishing :				
	a)	1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	**622.0**		cum	
15		Providing and laying damp-proof course 50 mm thick with cement concrete 1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size).	**2229.0**		sq.m.	

16		Applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality using 1.7 kg per squre metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil	**2231.0**		sqm.	
17		Extra for providing and mixing water proofing material in cement concrete work @ 1 kg per 50 kg of cement.	**651.0**		per bag of 50kg	
18		Making plinth protection 50 mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75 mm bed by dry brick ballast 40 mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	**5949.0**		sqm	
19		Providing and laying in position specified grade of reinforced cement concrete , excluding the cost of centring, shuttering, finishing and reinforcement. All work upto plinth level				
	a)	01:01.5:3(1 cement:1.5 coarse sand :3 graded stone aggregate 20 mm nominal size)	**106.0**		cum	
20		Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15^0, landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement :1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size).	**947.0**		cum	

21		Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15^0, landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement with 1:2:4 (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size).	**467.0**		cum	
22		Centring and shuttering including strutting, propping etc. and removal of form for:				
	a)	Foundations, footings, bases of columns etc. for mass concrete.	**428.0**		sqm	
	b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	**2429.0**		sqm	
	c)	Suspended floors, roofs, landings, balconies and access platform.	**3366.0**		sqm	
	d)	Shelves (Cast in situ)	**1471.0**		sqm	
	e)	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	**13127.0**		sqm	
	f)	Columns, Pillars, Piers, Abutments, Posts and Struts	**381.0**		sqm	
	g)	Stairs, (excluding landings) except spiral-staircases.	**13210.0**		sqm	
23		Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.				
	a)	Cold twisted bars	**228178.0**		kg	

	b)	Hard drawn steel wire	**507.9**		kg	
24		Providing and fixing in position 12 mm thick bitumen impregnated fibre board conforming to IS:1838 including cost of primer, sealing compound in expansion joints.	**581.9**		per cm depth per 100 m	
25		Providing and fixing sheet covering over expansion joints with iron screws as per design to match the colour / shade of wall treatment.				
	a)	Aluminium fluted strips 3.15 mm thick				
	b)	200 mm wide	**255.0**		meter	
26		Providing and laying in position machine batched, machine mixed and mixed machine vibrated design mix of cement concrete of specified grade for RCC work including pumping of concrete to site of laying but excluding the cost of shuttering	**748.0**		cum	
27		Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in :				
	a)	Cement mortar 1:6 (1 cement : 6 coarse sand)	**6057.0**		cum	
28		Brick work with F.P.S bricks of class designation 75 in superstructure above plinth level upto floor five level in all shapes and sizes :				
	a)	Cement mortar 1:6 (1 cement : 6 coarse sand)	**8282.0**		cum	

29		Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in :				
	a)	Cement mortar 1:4 (1 cement : 4 coarse sand)	**365.0**		cum	
30		Brick work with F.P.S bricks of class designation 75 in superstructure above plinth level upto floor five level in all shapes and sizes :				
	a)	Cement mortar 1:4 (1 cement : 4 coarse sand)	**922.7**		cum	
31		Half brick masonry with F.PS bricks of class designation 75 in superstructure above plinth LEVEL upto floor V level in :				
	a)	Cement mortar 1:4 (1 cement : 4 coarse sand)	**4381.0**		sqm	
32		Extra for providing and placing in position 2 Nos. 6 mm dia. M.S. bars at every third course of half brick masonry (with F.P.S. bricks).	**4381.0**		sqm	
33		Brick work in gauged arches in superstructure in cement mortar 1:3 (1 cement : 3 coarse sand) including centring and shuttering complete, for span upto 6 metres with F.P.S. brick of class designation	**271.0**		cum	
		76				
34		Honey-comb brick work 10/11.4 cm thick with bricks of class designation 75 in cement mortar 1:4 (1 cement : 4 coarse sand)	**223.4**		sqm	
35		Tile brick masonry with tile bricks of class designation 100 in foundation and plinth in :				

	a)	Cement mortar 1:6 (1 cement : 6 coarse sand)	**27.6**		cum	
36		Brick work with selected F.P.S. bricks of class designation 75 in expo sed brick work including making horizontal and vertical grooves 10mm wide 12mm deep complete from ground level upto plinth level in cement mortar 1:6 (1 Cement : 6 coarse sand)	**86.0**		cum	
37		Brick work with selected F.P.S. bricks of class designation 75 in exposed brick work including making horizontal and vertical grooves 10mm wide 12mm deep complete in superstructure above plinth level upto V level in cement mortar 1:6 (1 Cement : 6 coarse sand)	**675.0**		cum	
38		Deduct for supply of bricks supplied by the depatment	**8721.0**		1000nos	
39		Jointing old brick work in FPS BRICKS with new brick work in cement mortar 1:4 (1cement:4 coarse sand)				
			141.0		sqm	
40		Brick work 7 cm thick with F.P.S. brick of class designation 75 in cement mortar 1:3 (1 Cement : 3 coarse sand) in superstructure	**1193.0**		SQM	
41		Brick edging 7 cm wide 11.4 cm deep to plinth protection with bricks of class designation 75 including grouting with cement mortar 1:4 (1 cement : 4 fine sand)	**5018.0**		metre	
42		Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position :				
	a)	Red mirandi wood.	**0.048**		cum	

43		Providing and fixing 30 mm thick glazed shutters for doors, windows and clerestory windows using 10 kg/sqm. (4 mm thick) glass panes including black enamelled ISI marked M.S but hinges with necessary screws.				
	a)	Red mirandi wood	**111.0**		sqm	
44		Providing and fixing ISI marked flush door shutters confirming to IS-2202(Part 1) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters :				
	a)	25 mm thick (for cupboard) including ISI marked nickel plated bright finished M.S. Piano hinges with necessary screws.	**7.0**		sqm	
45		Providing and fixing flat pressed 3 layer particle board medium density exterior grade (Grade I) or graded wood particle board IS : 3087 marked to frame, backing or studding with screws etc. complete (Frames, backing or studding to be paid separately):				
	a)	12 mm thick	**8.0**		sqm	
46		Providing and fixing ISI marked flush door shutters confirming to IS-2202 non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters :				
			3341.4		sq m	
	a)	35mm thick				

47		Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of shutters (over all area of door shutter to be measured) over item no.5.06	**3340.4**		sqm	
48		Extra for cutting rebate in flush door shutters (Total area of the shutter to be measured).	**125.0**		sqm	
49		Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. all complete.				
	a)	Fixed to steel windows by welding	**23910.0**		kg.	
50		Providing and fixing hard drawn steel wire fabric 75 X 25 mm mesh of weight not less than 7.75 Kg per sqm to window frames etc. including 62 X 19 mm beading of second class teak wood.	**15.0**		sqm	
51		Providing and fixing ISI marked oxidised M.S. sliding door bolts with nuts and screws etc., complete :				
	a)	250 X 16 mm	**1847.0**		each	
52		Providing and fixing ISI marked oxidised M.S. tower bolt black finish, (Barrel type) with necessary screws etc. complete :				
	a)	250 X 10 mm	**1966.0**		each	
	b)	200 X 10 mm	**2551.0**		each	
	c)	150 X 10 mm	**2232.0**		each	
53		Providing and fixing ISI marked oxidised M.S. handles conforming to IS : 4992 with necessary screws etc. complete :				

	a)	125 mm	**5476.0**		each	
	b)	75 mm	**665.0**		each	
54		Providing and fixing oxidised M.S. casement stays (straight peg type) with necessary screws etc. complete :				
	a)	300 mm weighing not less than 200 gms	**4330.0**		nos	
55		Providing and fixing fiber glass reinforced plastics(FRP) door frames of cross section 90mm x45mm having single rebate of 32mm x 15mm to receive shutter of 30mm thickness the laminate door frame shall be moulded with fire resistant grade unsaturated polyster resin and choped mat. Door frame laminate shall be 2mm thick and shall be filled with suitable wooden blocks in all the three legs. The frame shall be covered with fibre glass from all sides. MS stay shall be provided at the bottom to steady the frame.	**5800.0**		metre	
56		Providing and fixing to existing door frames				
	a)	30 mm thick Glass Fibre Reinforced Plastic (FRP) panelled door shutter of required colour and approved brand and manufacture, made with fire - retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5 thick FRP laminate for panels and confirming to IS: 14856 - 2000 including fixing to frames.	**2368.0**		sqm	

57		Structural steel work in single section fixed without connecting plate including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	**906261.9**		kg	
58		Structural steel work riveted,bolted or welded in built up sections,trusses and framed work,including cutting, hoisti ng, fixing in position and applying a priming coat of approved steel primer all complete:	**28023.0**		kg	
59		Providing and fixing in position collapsible steel shutters with vertical channels 20 X 10 X 2 mm and braced with flat iron diagonals 20 X 5 mm size with top and bottom rail of T-iron 40 X 40 X 6 mm with 40 mm dia, steel pulleys complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	**335.0**		sqm	
60		Providing and fixing 1 mm thick M.S. sheet door with frame of 40 X 40 X 6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer.				
		Using flats 30 X 6 mm for diagonal braces and central cross piece	**121.0**		sqm	

61		Fixing standard steel glazed doors, windows and ventilators in walls with 15 X 3 mm lugs 10 cm long embedded in cement concrete blocks 15 X 10 X 10 cm of 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including fixing of float glass panes with glazing clips and special metal-sash putty of approved make, or metal beading with screws (only steel windows with lugs, glass panes cut to size and glazing clips or metal beading with screws, shall be supplied by department free of cost.)	**22976.0**		kg	
62		Providing and fixing factory made ISI marked steel glazed doors, windows and ventilators side/top/ centre hung with beading and all members such as K11B and K12B etc.of standard rolled steel sections, joints mitred and flash butt welded and sash bars tenonned and riveted with 15 X 3 mm lugs, 10 cm long, embedded in cement concrete blocks 15 X 10 X 10 cm of 1:3:6 (1cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including providing and fixing of hinges, pivots, float glass panes with glazing clips and special metal sash putty of approved make and a priming coat of approved steel primer, excluding the cost of other fittings except necessary hinges or pivots complete as per approved design.(Sectional weight of only steel members shall be measured for payment without weight of glass and other fittings)	**35172.0**		kg	

63		Providing and fixing T-iron frames for doors, windows and ventilators of mild steel Tee-sections, joints mitred and welded with 15 X 3 mm lugs 10 cm long embedded in cement concrete blocks 15 X 10 X 10 cm of 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with dash fasteneror with fixing clips or with bolts and nuts as require including fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer.	**29473.0**		kg	
64		Steel work welded in built up sections/framed work including cutting hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
	a)	In gratings, frames, guard bar, ladd ers, railings, brackets, gates & similar works.	**57394.72**		kg	
65		Providing and fixing hand rail of approved size by welding etc. to steel ladder railing,balcony railing & staircase railing including applying a priming coat of approved steel primer				
	a)	M.S. tube	**2341.4**		kg	
66		Welding by gas or electric plant including transportation of plant at site etc. complete.	**858783.0**		cm length	
67		Providing and fixing hard drawn steel wire fabric 75 X 25 mm mesh of weight not less than 7.75 Kg per sqm to steel frames etc. iwith M.S flat drawn.(Cost of M.S Flat shall be paid seperately)	**706.3**		sqm	

68		Providing and fixing Grab bar supports etc for disable friendly toilets using Brush finished Stainless steel members (Stainless Steel Grade 316 and finish no-4) including hold fasts, cutting, drilling, hoisting, fixing and argon welding etc. in position as per approved drawing and direction of Engineer in charge. (work shall be executed through deptt. approved specialised agency only)				
	(a)	wash basin Grab bar (2.5kgs) as per drawings	**57.0**		each	
	(b)	W.C. back rest (3.5kgs) as per drawings	**38.0**		each	
	(c)	L-Shape Grab bar (3.5kgs) as per drawings	**58.0**		each	
	(d)	Swing-Up Grab bar (4.7kgs) as per drawings	**39.0**		each	
69		Providing & fixing Placing the Stanless steel Mug of 1.0 litre capacity with handle & Mug shall be tighted with stainless steel chain of 0.60m long.	**1076.0**		each	
70		Providing and fixing M.S. handle for windows with necessary bolts nuts and washers complete)	**4208.0**		nos	

71		Providing and laying 60mm thick factory made cement concrete interlocking paver block of M-30 grade made by block making machine with strong vibrartory compaction and of approved size, design /shape laid in required colour and pattern over and including 50mm thick compacted bed of jamuna sand filling the joints with coarse sand etc all complete as per direction of Engineer in Charge.	**8906.8**		sqm	
72		Extra forProviding and laying 80mm thick factory made cement concrete interlocking paver block of M-50 grade made by block making machine with strong vibrartory compaction and of approved size, design /shape in lieu of 60 mm all as above	**2473.0**		sqm	
73		Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps etc. complete.				
	a)	40 mm thick with 20 mm nominal size stone aggregate	**2887.0**		sqm	
74		Cement plaster skirting (upto 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.)				
	a)	18 mm thick	**152.6**		sqm	
75		Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 40 mm nominal size) in pavements, laid to required slope and chamber in panels as required including consolidation finishing and tamping complete.	**3.0**		cum	

76		40 mm thick marble chips flooring, rubbed and polished to granolithic finish, under layer 28 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5 mm nominal size) and top layer 12 mm thick with white, black, chocolate, grey yellow or green marble chips of sizes from 7 mm to 10 mm nominal size laid in cement marble powder mix 3:1 (3 cement 1 marble powder) by weight in proportion of 2:3 (2 cement marble powder mix : 3 marble chips) by volume including cement slurry etc. complete :				
	a)	White cement without any pigment.	**250.0**		sqm	
	b)	Ordinary cement without any pigment.	**300.0**		sqm	
77		Providing and fixing glass strips in joints of terrazo / cement concrete floors.				
		40 mm wide and 4 mm thick.	**258.0**		metre	
78		Providing and fixing 10 mm thick acid and/ or alkali resistant tiles of approved make and colour using acid and or alkali resisting mortar bedding and joints filled with acid and or alkali resisting cement as per IS : 4457 complete as per the direction of Engineer-in-Charge.				
	a)	In flooring on a bed of 10 mm thick mortar 1:4 (1 acid proof cement : 4 coarse sand)				
		Acid and alkali resistant tile	**4287.0**		sqm	
	b)	In dado / skirting on 12 mm thick mortar 1:4 (1 acid proof cement : 4 coarse sand)				
		Acid and alkali resistant tile	**2112.0**		sqm	

79		Marble stone flooring with 18 mm thick marble stone (sample of marble shall be approved by Engineer-in-charge) over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing complete with :				
		Udaipur green marble	**324.0**		sqm	
80		Kota stone slab flooring over 20 mm (averge) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar 1:4 (1 cement : 4 coarse sand) :				
	a)	25 mm thick	**45472.0**		sqm	
81		Kota stone slabs 25 mm thick in risers of steps, skriting, dado and pillars laid on 12 mm (averge) thick cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	**4452.0**		sqm	
82		40 mm thick fine dressed stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement : 5coarse sand) with joints finished flush				
	a)	Red sand stone	**18.0**		sqm	

83		Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades, except bergundy, bottle green, black of any size as approved by Engieer-in-Charge in skirting, risers of steps and dados over 12 mm thick bed of Cement Mortar 1:3 (1 Cement : 3 Coarse sand) and jointing with grey cement slurry @ 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	**19588.0**		sqm	
84		Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorptions less than 0.08% and conforming to IS : 15622 of approved make in all colours and shades, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc., complete				
		Size of Tile 60 X 60 cm	**1878.0**		sqm	
85		Providing and fixing 18 mm thick gang saw cut mirror polished premoulded and prepolished, machine cut for kitchen platforms, vanity counters,window sills, facias and similar locations of required size of approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edge to give high gloss finish etc. complete at all levels.				
		Granite of any colour and shade	**1251.0**		sqm	
	a)	area of slab over 0.50 sqm				

86		Providing and fixing stone slab table rubbed edges rounded and polished of size75x50 cm deep and 1.8 cm thick fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4(1 cement:2 coarse sand : 4 graded stone aggregate 6mm nominal size) as per direction of engineer in charge finished smooth				
	a)	Granite Stone of Approved Shade	**327.5**		sqm	
87		50mm thick pre-polished kota stone slab dado over 20mm(average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of 1:4(1Cement : 4 Coarse sand) as per directions of engineer in charge	**205.0**		sqm	
88		Extra for providing edge moulding to 18mm thick marble stone counters, vanities etc including machine polishing to edge to give high gloss finish etc complete as per design approved byengineer in charge				
	a)	Granite work	**2128.0**		meter	
89		Extra for fixing marble /granite stone over and above corresponding basic item, in facia and drops of width upto 150mm with expoxy resin based adhesive including cleaning etc. complete	**2559.0**		meter	

90		Providing sand stone slab for roofing and laying them in cement mortar 1 : 4 (1 cement : 4 coarse sand) over wooden karries or R.C.C. battens (Karries and battens to be paid seperately) including pointing the ceiling joints with cement mortar 1:3 (1 cement : 3 fine sand) complete				
		Red sand stone slab				
	a)	40 to 50 mm thick	**29553.0**		sqm	
91		Providing gola 75 X 75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge) including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design :				
	a)	In 75 X 75 mm deep chase	**3526.0**		metre	
92		Making khurras 45 X 45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1mx1mx400 micron, finished with 12 mm cement plaster 1:3 (1 cement :3 coarse sand) and a coat of neat cement rounding the edges and making and finishing the outlet complete	**482.0**		each	
93		Providing and fixing on wall face unplasticised - Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.				
		Single socketed pipes				
	a)	110 mm diameter	**1121.0**		metre	

94		Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised - Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.				
	a)	Bend 87.5^{o}				
		110mm bend	**285.0**		each	
	b)	Shoe (Plain)				
		110mm shoe	**103.0**		each	
95		30 mm red sand stone sun-shade (chisel-dressed) supported on red sand stone brackets, fixed in walls with cement mortar 1:4 (1 cement : 4 coarse sand) including finishing complete.				
			491.0		sqm	
96		10 mm thick (average) mud phaska of damped brick earth on roof laid to slope consolidated and plastered with 25 mm thick mud mortar mixed with bhusa at 35 kg per cum of earth and gobri leaping with mix 1:1 (1 clay : 1 cow dung) and covered with flat tile bricks of class designation 100 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement and finishing neat:				
		With F.P.S brick tiles	**251.32**		sqm	

97		Painting top of roofs with bitumen of approved quality at 17 kg per 10 sqm impregnated with a coat of coarse sand at 60 cudm per 10 sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete :				
		With residual type petroleum bitumen of penetration 80/100	**24254.94**		sqm	
98		Providing non-asbestos high impact Polypropylene reinforced cement 6 mm thick corrugated sheets (as per IS: 14871) roofing up to any pitch and fixing with polymer coated J, or L hooks, bolts and nuts 8m dia. G.I. Plain and bitumen washers or with self drilling fastener and EPDM washers etc. complete excluding the cost of purlins, rafters and trusses: corrugated sheets and including cutting to size and shape wherever required.	**6051.0**		SQM	
99		Providing corrugated G.S.sheet roofing including vertical/curved surface fixed with polymer coated J or L hooks,bolts & nuts 8 mm diameter with bitumen and G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/ vertical or curved surfaces) excluding the cost of purlins ,rafters and trusses and including cutting to size and shape wherever required				
		1.00 mm thick with zinc coating not less than 275gm/sqm	**150.0**		SQM	
100		12 mm cement plaster of mix :				
	a)	1:6(1 cement : 6 fine sand)	**44549.0**		sqm	

101		15 mm cement plaster on the rough side of single or half brick wall of mix :				
	a)	1:6 (1 cement : 6 fine sand)	**40351.0**		sqm	
102		6 mm cement plaster of mix :				
	a)	1:3 (1 cement : 3 fine sand)	**9108.0**		sqm	
103		White washing with lime to give an even shade :				
	a)	New work (three or more coats)	**40568.0**		sqm	
104		Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade				
	a)	New work (two or more coats) over and including priming coat with cement primer	**80992.0**		sqm	
105		Finishing walls with water proofing cement paint of required shade :				
	a)	New work (Two or more coats applied @ 3.84 kg/10 sqm)	**17297.0**		sqm	
106		Finishing walls with Acrylic Smooth exterior paint of required shade :				
	a)	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including base coat of water proofing cement paint applied @ 2.20 kg/10 sqm)	**42629.0**		sqm	
107		Painting one thin coat with white lead of approved brand and manufacture on wet or patchy portion of plastered surfaces	**15089.0**		sqm	
108		Applying priming coat :				
	a)	With ready mixed aluminium primer of approved brand and manufacture on resinous wood and plywood	**1730.0**		sqm	

109		Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :				
	a)	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture	**102116.0**		sqm	
110		Providing and applying two coats of fire retardant paint unthinned on cleaned wood/ply surface @ 3.5 sqm per litre per coat including preparation of base surface as per recommendations of the manufacturer to make the surface fire retardant.	**7337.6**		sqm	
111		Pebble dash plaster upto 10 m height above ground level with a mixture of washed pebble or crushed stone 6 mm to 12.5 mm nominal size dashed over and including fresh plaster in two layers under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand) and top layer 10 mm cement plaster with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 10% finely grounded hydrated lime by volume of cement	**169.0**		sqm	
112		Pointing on brick work or brick flooring with cement mortar 1:3 (1 cement : 3 fine sand) :				
	a)	Flush/Ruled/Struck or weathered pointing	**13902.0**		sqm	

113		Washed stone grit plaster on exterior walls of height upto 10 M. above level in two layers, under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand) furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per square metre, top layer 15 mm cement plaster 1:1/2:2 (1 cement : 1/2 coarse sand : 2 stone chipping 10 mm nominal size) in panels with groove all around as per approved pattern including scrubbing and washing, the top layer with brushes and water to expose the stone chippings, complete as per specification and direction of Engineer-in-Charge (Payment for providing grooves shall be made separately)				
			5012.0		sqm	
114		Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer including removal of wooden battens, repair to the edges of panels and finishing the groove complete as per specifications and direction of the Enginner-in-charge.				
	a)	20 mm wide and 15 mm deep groove	**4185.0**		metre	
115		15 mm cement plaster on the rough side of single or half brick wall finished with a floatinng coat of neat cement of mix:.				
	a)	1:3(1 cement:3 fine sand)	**6582.0**		sqm	
116		15 mm cement plaster on rough side of single or half brick wall of mix :				
	a)	1:4 (1 cement : 4 coarse sand)	**51.0**		sqm	

117		Repairs to plaster of thickness 12 mm to 20 mm in patches of area 2.5 sq. metres and under including cutting the patch in proper shape,raking out joints and preparing and plastering the surface of the walls complete including disposal of rubbish to the dumping ground within 50 metres lead :				
	a)	With cement mortar 1:4 (1 cement : 4 fine sand)	**18302.0**		sqm	
118		Making the opening in brick masonry including dismantling in floor or walls by cutting masonry and making good the damages to walls , flooring and jambs complete to match the existing surface i/c disposal of malba/rubbish to the nearest municipal dumping ground :				
	a)	For door/window/clerestory windows	**2123.6**		sqm	
119		Renewing glass panes, with putty and nails wherever necessary :				
	a)	Float Glass panes of thickness 4mm	**5845.0**		sqm	
120		Regrading terracing of mud phaska covered with tiles or brick, in cement by dismanting tiles or bricks, removing mud plaster preparing the surface of mud phaska to proper slope relaying mud plaster gobri leaping and tiles or bricks, grouted in cement mortar 1:3 (1 cement : 3 fine sand) including replacing unserviceable tiles or bricks with new ones and disposal of unserviceable material to the dumping ground (the cost of the new tiles or brick excluded) withing 50 metres lead.	**10973.0**		sqm	
121		Supplying of brick tiles of class designation 100	**151328.0**		1000nos	

122		Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :				
	a)	One or more coats on old work.	**22353.8**		sqm	
123		Finishing walls with Acrylic Smooth exterior paint of required shade :				
	a)	Old work (Two or more coat applied @ 1.67 ltr/10 sqm) on existing cement paint surface)	**33196.0**		sqm	
124		Flush pointing with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement for flat tile bricks on top of mud phaska :				
	a)	With F.P.S brick tiles	**5033.0**		sqm	
125		Taking out wind ties from roof including cutting out rusted bolts, nuts etc. and removing materials to any distance within compound and stacking.	**6460.0**		kg	
126		Renewing bottom rail and / or top runner of collapsible gate including making good all damages and applying priming coat of zinc chromate yellow primer of approved brand and manufacturer.	**109.0**		kg	
127		Removing white or colour wash by scrapping and sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete	**97444.0**		sqm	
128		Removing dry or oil bound distemper,water proofing cement paint and the like by scrapping, sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete	**10845.0**		sqm	

129		Re-lettering with black Japan paint of approved brand and manufacture.	**93225.0**		per letter per centimetre height	
130		Chipping of unsound/weak concrete from beams,chajjas etc. with power driven chiesel or pneumatic chisel as directed by engineer in charge upto 50 mm average depth including saw cutting of all edges making square shoulders of cavities including preparing the addjoining areas with steel props and bracing and steel/timber runner to relieve the member from load coming on it incl. steel scaffolding with working platform whereever required as per design and pattern approved by engineer in charge complete including disposal of debris within 50 metres lead	**781.0**		sqm	
131		Extra/deduct for more or less chipping for every additional or less thickness of 10 mm or part thereof beyond 50 mm	**17.0**		sqm	
132		Drilling holes in R.C.C,providing and inserting epoxy dipped mild steel shear key bars in existing concrete of required length and dia etc. complete as per specification and directions of Engineer in charge	**205.0**		nos	
133		Cleaning reinforcement of concrete and rust allround including removing concrete from behind the reinforcement bars with power driven or pneumatic chisel to give an average 25mm but not less than 15mm clear air gap by hammering the rebar using wire brushes,chiselling etc.	**725.0**		sqm	

134		Application of Alkaline rust remover on rusted reinforcement such as rusti cide Sswith paint brush and removing loose particles after 24 hours of its application with wire brush and applying priming coat of acrylic polymer and cement in ratio 1;1.5 in 2 coats at an interval of minimum 4 hrs. as directed by the Engineer in charge.	**698.0**		metre	
135		Providing , mixing and applying bonding coat of approved epoxy adhesive as per specifications and directions of the Engineer in charge.	**162.0**		sqm	
136		Providing, mixing and applying over reinforcement bars zinc rich anti rust agent as per manufacturers directions approved products like CICO-Zincilate 500 /Fosroc Nitrozinc	**697.0**		sqm	
137		Providing, arranging and performing standard rehabilitation work test related to RCCstructural member including epoxy grouting operations as per prescribed procedure and in an approved manner by an approved agency where ever required by the engineer in charge to ensure quality of workmanship and to test structure stability of the members restored				
		Ultrasonic pulse velocity test	**1.0**		nos	
138		Cleaning exposed concrete surface of work and foreign materials by means of sand blasting with coarse sand followed by cleaning with free cold air blast upto a height of 30 metres above plinth level including steel scafolding with working platform as per design given by the contractor and approved by the engineer in charge.	**697.0**		sqm	

139		Providing and fixing double scaffolding system (cup lock type) on the exterior side , up to seven story height made with 40 mm dia. M.S. tube 1.5m centre to centre horizontal & vertical tubes joining with cup & lock system with MS tubes, MS tube challies, MS clamps and MS staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for the required duration as approved and removing it there after. The scaffolding system shall be stiffened with bracing , runners, connection with the building etc wherever required for inspection of work at required locations with essential safety features for the workmen etc. complete as per directions and approval of Engineer - in - charge. The lavational area of the scaffolding shall be measured for payment purpose. The payment wi ll be made once irrespective of duration of scaffolding .	**1950.0**		sqm	
140		Repairing ceiling plaster by dismantling loose plasteror cement concrete of RCC`slabs and making good the same by providing rabbit mesh and binding with wire to reinforcement filling undulations and rough plaster with cement concrete of mix 1:1.5:3 (1 cement :1.5 coarse sand: 3 stone aggregate 6mm nominal size) including cement slurry@2.2 kg/sqm and plastering with 6mm thick cement plaster of mix 1:3 (1 cement: 3 fine sand) including all necessary scaffoldng and disposal of rubbish to the dumping ground within 50 metre lead	**5685.0**		sqm	

141		Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.				
		(a) Cold twisted bars with rust protective coatings. Two coat of IP - NET-RB on surface after cleaning of bars @ 14 Litre / Tonne of bars.	**50.0**		Kg	
		(b) Hard drawn wire fabric.	**209.0**		kg	
142		Grinding and polishing the existing terrazo/kota flooring by first grinding with 120 no. carborandum stone mechanically , cleaning the same with oxalic acid and finally polishing with wax polish.	**10789.0**		sqm	
143		White washing with lime to give an even shade :				
	a)	Old work (two or more coats)	**20436.0**		sqm	
144		Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade :				
	a)	One or more coats on old work.	**5663.0**		sqm	

145		Dismantling, damaged concrete from all round the rusted / corroded reinforced bars, cleaning the rust from reinforcement with the help of wire brush, jute cloth & providing and fixing rabbit wire mesh to the ceiling with " U " clips and wires applying a coat of cement slurry @ 2.00 kg/sqm on the ceiling and plastering the surface smooth in two layers. The under layer shall be consists of 20mm thick cement plaster 1:4 (1cement : 4 coarse sand) furrowing the under layer with scratching tool & furrowing shall be done diagonally both ways and shall be about 2 mm deep. The scratched lines shall be not more than 10mm apart.				
		Applying the cement slurry on the under layer @ 2.00 kg/sqm & top layer 15mm cement plaster 1:4 (1cement : 4 coarse sand). The top layer should be applied with in one or two days of application of first layer. After one day of application of top layer, curing compound of approved brand and manufacture shall be applied, all complete as per direction of Engineer in Charge.	**3677.0**		sqm	
146		Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of engineer in charge				
	a)	1:3:6 or richer mix	**2244.0**		cum	
			cum			
	b)	1:4:8 or leaner mix	**1137.0**		cum	
			cum			
147		Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of engineer in charge				

	a)	In cement mortar	**5817.9**		cum	
148		Demolishing R.C.C. workmanually/by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of engineer in charge	**90.0**		cum	
149		Extra for cutting reinforcement bars manually/by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work) as per direction of engineer in charge	**638.0**		sqm	
150		Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within 50 metres lead.	**421231.0**		kg	
151		Dismantling tile work in floors and roofs laid in cement mortar including stacking material within 50 metres lead.				
	a)	For thickness of tiles 10 mm to 25 mm	**5195.0**		sqm	
152		Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	**1252.0**		sqm	
153		Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	**15155.0**		sqm	

154		Dismantling roofing including ridges, hips valleys and gutters etc., and stacking the material within 50 metres lead of :				
	a)	G.S. Sheet	**19141.0**		sqm	
	b)	Asbestos sheet	**17535.0**		sqm	
155		Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 metres lead :				
	a)	Of area 3 sq. metres and below	**1072.0**		each	
156		Taking out doors, windows and clerestory window shutters (steel or wood) including stacking within 50 metres lead :				
	a)	Of area 3 sq. metres and below	**718.0**		each	
157		Removing mortar from bricks and cleaning bricks including stacking within a lead of 50 m. (stacks of cleaned bricks shall be measured) :				
	a)	From brick work in cement mortar	**684194.0**		1000 nos.	
158		Demolishing brick tile covering in terracing including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	**1436.0**		sqm	
159		Demolishing mud phaska in terracing and disposal of material within 50 metres lead	**1436.0**		cum	

160		Dismantling stone slab roofing over wooden karries or R.C.C. battens (dismantling karries and battens to be paid for separately) including stacking of serviceable material and disposal of unserviceable material within 50 metres lead :	**17.0**		cum	
161		Dismantling of cement concrete platform along with curtain walls and base concrete etc. including stacking of useful materials near the site and disposal of unserviceable materials within 50 metres lead :				
	a)	120 X 120 cm (outside to outside)	**307.0**		each	
	b)	210 X 120 cm (outside to outside)	**547.0**		each	
162		Carriage of building rubbish by mechanical transport including loading, unloading and stacking to a lead upto any km.	**10781.2**		cum	
163		Credit for servicable dismentled material demolished from various items				
	a)	Reinforcement bars	**7543.0**		kg	
	b)	Dismantledsteel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts	**430540.1**		kg	
	c)	Old bricks	**875099.0**		nos	
	d)	Dismantled doors, windows and clerestory windows (steel) shutter including chowkhats, architrave, holdfasts etc.	**26035.0**		kg	
	e)	Taken out doors, windows and clerestory window shutters (steel)	**3.0**		kg	

	f)	Dismantled roofing including ridges, hips valleys and gutters etc., of :				
	i)	G.S. Sheet	**19138.6**		sqm	
	ii)	Asbestos sheet	**12672.6**		sqm	
164		Extra for Renewing glass panes using the wired Glass panes4mm thick in place of Glass panes weighing 10 kg/sqm.	**8096.0**		sqm	
165		Providing and fixing ceramic steel chalk writing board in green colour as per following specifications and directions of engineer incharge				
	(A)	The writing top surface shall be made of CRC steel sheet of thickness 0.3 to 0.4 mm and shall have viterous enamel coating of minimum 95 microns thickness on top and 35 microns thickness on the back.				
	(B)	The board shall have approved PVC corners and round framing of anodized extruded aluminium alloy hollow section designation 63400 as per IS: 1285/1975 or IS 733/1983. The frame section shall be front-20mm,side 16mm and wall thickness 1.2mm.				
	(c)	The core material shall be 9mm thick MDF board having bulk density 750kg/m^3 and grade- I as per IS 12406/88.				
	(D)	The backing material sheet shall be minimum 0.25mm thick electro galvanized steel sheet confirming to IS 277-92 properly fixed with suitable adhesive.				
		1200 x 2400 mm size.	**3819.0**		sqm	

166		Providing and fixing 10x10x7.5 cm Delhi quartzite stone block hand cut and chisel dressed on top for paving in floors and drains etc laid over 20 mm thick base mortar 1:4 (1 cement:4 coarse sand) with joints 10 mm filled with the same mortar including cleaning , curing complete as per approved drawing and directions of engineer in charge.	**633.0**		sqm	
167		Providing and fixing concertina coil fencing with required dia 610 mm (having 15 nos. round per 6 metres length) upto 3 m height of wall with existing angle iron Y shaped placed 2.4 m or 3 m apart and with 9 horizontal R.B.T stud tied with G.I staples and G.I clips to retain horizontal including necessary bolts or G.I barbed wire tied to angle iron all complete as per direction of engineer in charge with reinforced barbed tape (R.B.T) / spring core (2.5mm thick) wire of high tensile strength of 165kg/sqmm with tape (0.52 mm thick) and weight 43.478 gm/metre (cost of M.S.angle and C.C blocks shall be paid seperately)	**8159.0**		metre	
168		Providing and fixing in position precast R.C.C. manhole cover and frame of required shape and approved quality				
	a)	L D- 2.5				
		Rectangular shape 600x450mm internal dimensions	**1808.0**		Nos	
169		Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Enginner-in-Charge and consisting of :				

	I)	Ist layer of 22 mm to 25 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound conforming to IS : 2645 in the recommended proportion over the levelling course(levelling course to be paid seperetally) Joints sealed and grouted with cement slurry mixed mixed with water proofing compound.				
	II)	2nd layer of 25 mm thick cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound in recommended proportions.				
	III)	Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.				
	a)	Using rough kota stone.	**339.0**		sqm	
170		Providing and fixing laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25mm thick with cement slurry mixed with water proofing compound conforming to IS : 2645 in recommended proportions with a gap of 20 mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20 mm thick with neat cement punning mixed with water proofing compound in recommeded proportion complete at all levels and as directed by Engineer-in-Charge.				
	a)	Using rough kota stone	**638.0**		sqm	

171		Providing and laying water proofing treatment in sunken protion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying :				
	a)	First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. This layer will be allowed to air cure for 4 hours.				
	b)	Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours.				
		The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonary with polymer mixed slurry.				
	Note :	Rendering /plastering as protective layer, if required will be paid separately	**1493.0**		sqm	
172		Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations.				
	a)	Applying a slurry coat of neat cement using 2.75 kg/sqm. Of cement admixed with water proofing compound conforming to IS. 2645 and approved by engineer in charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment.				

	b)	Laying brick batswith mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by engineer in charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by engineer in charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of juntions of walls and slabs.				
	c)	After two days of proper curing applying a second coat of cement slurry using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by engineer in charge.				
	d)	Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement : 4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by engineer in charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300 X 300 mm square 3mm deep.				
	e)	The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge.				
		With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	**10226.0**		sqm	

173		Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisti ng of following operations.				
		a) Applying and grouting a slurry coat of neat cement using 2.75 kg/sqm. Of cement admixed with proprietary water proofing compound conforming to IS. 2645 over the RCC slab including cleaning the surface before trea tment.				
		b) Laying cement concrete using broken bricks/brick bats 25 mm to 100 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound conforming to IS : 2645 over 20 mm thick layer of ce ment mortar of mix 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound conforming to IS : 2645 to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of juntions of walls and slabs.				
		c) After two days of proper curing applying a second coat of cement slurry admixed with proprietary water proofing compound conforming to IS : 2645.				
		d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement : 4 coarse sand) admixed with proprietary water proofing compound conforming to IS : 2645 and finally finishing the surface with trowel with neat cement slurry and making of 300 X 300 mm square.				

		The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge.				
		With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	**7786.0**		sqm	
174		Grading roof for water proofing treatment with				
		a) Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	**136.0**		cum	
175		Providing and fixing white vitreous china water closet squatting pan (Indian type W.C. pan) with 100mm sand cast P or S trap, white P.V.C. pneumatic flushing cistern with C.P Actuator (of approved make) with all fittings, and fixtures complete including cutting and making good the walls and floors wherever required.				
		White vitreous China Orissa pattern W.C. pan of size 580 x 440 mm with integrated type foot rests.	**1177.0**		Each	
176		Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid,10 litre low level white viterous china flushing cistern & C.P. flush bend with fittings & C.I. brackets,40mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required.				
		a) W.C. pan with ISI marked white solid plastic seat and lid,	**249.0**		Each	

177		Providing and fixing white vitreous china laboratary sink with C.I. Brackets, C.P. brass chain with rubber plug 40 mm C.P. brass waste and 40 mm C.P. brass trap with necessary C.P. brass unions complete including painting of fittings and brackets, cutting and making good the walls wherever required.				
	a)	Size 450 X 300 X 150 mm	**550.0**		Each	
178		Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require :				
		White Vitreous China				
	a)	Flat back wash basin size 550x400mm with single 15 mm C.P brass pillar tap	**253.0**		Each	
179		Providing & fixing P.V.C waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
		Flexible pipe				
	a)	32 mm dia	**258.0**		Each	
	b)	40 mm dia	**527.0**		Each	
180		Providing and fixing 600x450mm beveled edge mirror of superior glass (of approved quality) complete with 6mm thick hard board ground fixed to wooden cleats with C.P.brass screws and washers complete.	**192.0**		Each	

181		Providing and fixing 600x120x5mm glass shelf with edges round of supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40mm long screwes, rawl plugs etc. complete.	**19.0**		Each	
182		Providing and fixing Toilet paper holder				
	a)	vitreous china	**124.0**		Each	
183		Providing and fixing PTMT Bottle Trap for Wash basin and sink				
	a)	Bottle trap 31 mm single piece moulded with height of 270mm effective length of tail pipe 260 mm from the center of the waste coupling 77mm breadth with 25mm minimum water seal, weighing not less than 260gms.	**83.0**		Each	
184		Providing and fixing PTMT towel ring trapezoidal shape 215mm long, 200mm wide with a minimum distances of 37mm from wall face with concealed fittings arrangement of approved qualityand colour, weighing not less than 88 gms	**110.0**		Each	
185		Providing and fixing PTMT 15 mm Urinal spreader size 95x69x100mm with 1/2" BSP thread and shapes , weighing not less than 60 gms	**817.0**		Each	
186		Providing & fixing PTMT push cock of approved quality and colour				
	a)	15mm nominal bore 98mm long weighing not less than 75 gms.	**3340.0**		Each	
187		Providing & fixing PTMT soap Soap Dish Holder Having length of 138mm, breadth 102mm, Heig ht of 75mm with concealed fitting arrangements, weighing not less than 106gms.	**430.0**		Each	

188		Providing and fixing soil , waste and vent pipe:				
		100 mm dia				
	a)	Sand cast iron S&S pipe as per IS:1729	**3670.0**		metre	
.	b)	Centrifugally Cast (spun) iron socketed pipe as per IS:3989.	**5925.0**		metre	
189		Providing and fixing M.S. holder - bat clamps of approved design to Sand Cast Iron / Cast Iron (spun) pipe embedded in and including cement concrete blocks 10 x 10 x 10 cm of 1 : 2 : 4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including cost of cutting holes and making good the walls etc.				
	a)	For 100 mm dia pipe	**2076.0**		Each	
190		Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick bolts and nuts complete.				
		100 mm				
	a)	Sand cast iron S&S as per IS: 3989	**534.0**		Each	
191		Providing and fixing plain bend of required degree.				
		100 mm				
	a)	Sand cast iron S&S as per IS 1729	**425.0**		Each	
	b)	Sand cast iron S&S as per IS 3989	**1712.0**		Each	
192		Providing and fixing heel rest sanitary bend .				
		100 mm dia				
	a)	Sand cast iron S&S as per IS-1729	**365.0**		Each	
	b)	Sand cast iron S&S as per IS-3989	**164.0**		Each	

193		Providing and fixing double equal plain junction of required degree.				
		100x 100 x 100 x100mm				
	a)	Sand cast iron S&S as per IS: 3989	**823.2**		Each	
194		Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
		100x 100 x 100 mm				
	a)	Sand cast iron S&S as per IS: 3989	**394.0**		Each	
195		Providing and fixing single equal plain junction of required degree.				
		100x 100 x 100 mm				
	a)	Sand cast iron S&S as per IS: 3989	**1621.0**		Each	
196		Providing and fixing terminal guard :				
		100 mm				
	a)	Sand cast iron S&S as per IS: 3989	**217.0**		Each	
197		Providing and fixing collar :				
		100 mm				
	a)	Sand cast iron S&S as per IS: 3989	**1280.0**		Each	
198		Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of diameter.				
	a)	100 mm	**13906.0**		Each	
199		Providing and fixing M.S. stays and clamps for sand cast iron/centrifugally cast (spun) iron pipes of diameter :				
	a)	100 mm	**1899.0**		Each	
200		Providing and fixing trap of self cleansing design with screwed d own or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors a) 100 mm inlet and 100 mm outlet				
		sand cast iron S&S as per IS:3989	**1345.0**		Each	

201		Cutting chases in brick masonry walls for following diameter sand cast iron / centrifugnally cast (spun) iron pipes and making good the same with cement concrete 1:3:6 (1 cement : 3 coarse sand :6 graded stone aggregate 12.5 mm nominal size) including necessary plaster and pointing in cement mortar 1:4 (1 cement :4 coarse sand).				
	a)	100 mm dia	**428.0**		Metre	
202		Painting sand cast iron/centrifugally cast (spun) iron soil, waste vent pipes and fittings with paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work:				
	a)	100 mm diameter pipe	**3706.8**		Metre	
203		Providing & fixing white vitrious china flat back or wall corner type lipped front urinal basin of 430x 260 x350 mm and 340 x 410x65 mm sizes respectively with automatic flushing cistern with standerd flush pipe & CP brass spreaders with brass unions & GI clamps complete including painting of fittings & brackets, cutting and making good the wals & floors whereever required.	**78.0**		Nos	
		One urinal basin with 5 ltr white PVC automatic flushing cistern.				

204		Providing and fixing Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite Pressure Pipes confirming to IS 15450 U.V. stablized with carbon black having thermal stability for hot and cold water supply, capable to withstand temperature upto 80 degree C including all special fittings of composite material(engineering plastic blend and brass inserts wherever required) e.g elbows, tees, reducers, couplers and connectors etc with clamps at one metre spacing. This includes testing of joints complete as per direction of engineer in charge.				
		Internal work -Exposed on wall				
	a)	1620 (20 mm OD) pipe	**80.0**		Metre	
	b)	2025 (25 mm OD) pipe	**761.0**		Metre	
205		Providing and fixing Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite Pressure Pipes confirming to IS 15450 U.V. stablized with carbon black having thermal stability for hot and cold water supply, capable to withstand temperature upto 80 degree C including all special fittings of composite material(engineering plastic blend and brass inserts wherever required) e.g elbows, tees, reducers, couplers and connectors etc with clamps at one metre spacing. This includes the cost of cutting chases and including testing of joints complete as per direction of engineer in charge.				
		Concealed work including cutting chases and making good the walls etc., complete.				
	a)	1620 (20 mm OD) pipe	**977.2**		Metre	

	b)	2025 (25 mm OD) pipe	**498.3**		Metre	
206		Providing and fixing Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite Pressure Pipes confirming to IS 15450 U.V. stablised with carbon black having thermal stability for hot and cold water supply, capable to withstand temperature upto 80 C including all special fittings of composite material(engineering plastic blend and brass inserts wherever required) e.g elbows, tees, reducers, couplers and connectors etc with trenching, refilling and testing of joints complete as per direction of engineer in charge.				
		External work				
		1620 (20 mm OD) pipe	**83.0**		Metre	
		2025 (25 mm OD) pipe	**132.0**		Metre	
207		Providing and fixing G.I. pipes complete with G.I fittings and clamps, including cutting and making good the walls etc. (internal work)				
		Exposed On Wall				
	a)	15 mm dia nominal bore.	**1916.4**		Metre	
	b)	20 mm dia nominal bore.	**1357.3**		Metre	
	c)	25 mm dia nominal bore.	**2299.9**		Metre	
	d)	32 mm dia nominal bore.	**1550.7**		Metre	
	e)	40 mm dia nominal bore.	**799.0**		Metre	
	f)	50 mm dia nominal bore.	**147.0**		Metre	
208		Concealed pipe including painting with anti corrosive bitumastic paint, cutting chases & making good the wall.				
	a)	15 mm dia nominal bore	**2829.5**		Metre	

	b)	20 mm dia nominal bore	**522.0**		Metre	
209		Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. (external work).				
	a)	15mm dia. Nominal bore	**160.0**		Metre	
	b)	20mm dia. Nominal bore	**368.0**		Metre	
	c)	25mm dia. Nominal bore	**2092.3**		Metre	
	d)	32mm dia. Nominal bore	**2762.3**		Metre	
	e)	40mm dia. Nominal bore	**1950.7**		Metre	
	f)	50mm dia. Nominal bore	**784.7**		Metre	
	g)	65mm dia. Nominal bore	**279.8**		Metre	
	h)	80mm dia. Nominal bore	**110.0**		Metre	
210		Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete.				
	a)	25 to 40 mm nominal bore	**152.0**		Each	
211		Providing and fixing gun metal gate valve with C.I. wheel of approved quality. (screwed end).				
	a)	25 mm nominal bore	**607.0**		Each	
	b)	32 mm nominal bore	**394.0**		Each	
	c)	40 mm nominal bore	**314.0**		Each	
	d)	50 mm nominal bore	**102.0**		Each	

212		Providing and fixing gun metal non-return valve of approved quality (screwed end).				
		40mm dia. Nominal bore	**127.0**		Each	
	a)	Horizontal				
		80mm dia. Nominal bore	**20.0**		Each	
	b)	Horizontal				
213		Providing and fixing unplasticised PVC connection pipe with brass unions.				
		30 cm length .				
	a)	15mm nominal bore.	**895.0**		Each	
214		Painting G.I. pipes and fittings with synthetic enamel white paint over a ready mixed priming coat, both of approved quality for new work.				
	a)	15 mm diameter pipe	**1924.4**		Metre	
	b)	20 mm diameter pipe.	**1361.3**		Metre	
	c)	25 mm diameter pipe.	**2299.9**		Metre	
	d)	32 mm diameter pipe.	**1818.8**		Metre	
	e)	40 mm diameter pipe.	**802.0**		Metre	
	f)	50 mm diameter pipe.	**202.0**		Metre	
215		Painting G.I. pipes and fitting with two coats of anti-corrosive bitumastic paint of approved quality.				
	a)	15 mm diameter pipe.	**160.0**		Metre	
	b)	20 mm diameter pipe.	**274.6**		Metre	
	c)	25 mm diameter pipe.	**1129.9**		Metre	
	d)	32 mm diameter pipe.	**1966.4**		Metre	
	e)	40 mm diameter pipe.	**1868.4**		Metre	
	f)	50 mm diameter pipe.	**921.2**		Metre	

	g)	65 mm diameter pipe.	**297.7**		Metre	
	h)	80 mm diameter pipe.	**118.0**		Metre	
216		Providing and filling sand of grading Zone V or coarse grade alround the G.I. pipes in extrenal work.				
	a)	15 mm diameter pipe.	**160.0**		Metre	
	b)	20 mm diameter pipe.	**380.0**		Metre	
	c)	25 mm diameter pipe.	**2175.2**		Metre	
	d)	32 mm diameter pipe.	**2971.3**		Metre	
	e)	40 mm diameter pipe.	**2080.7**		Metre	
	f)	50 mm diameter pipe.	**784.7**		Metre	
	g)	65 mm diameter pipe.	**281.0**		Metre	
	h)	80 mm diameter pipe.	**118.0**		Metre	
217		Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (new work).				
	a)	15 mm nominal bore.	**461.0**		Each	
	b)	20 mm nominal bore.	**469.0**		Each	
	c)	25 mm nominal bore.	**957.0**		Each	
	d)	32 mm nominal bore.	**1041.0**		Each	
	e)	40 mm nominal bore.	**597.0**		Each	
	f)	50 mm nominal bore.	**388.0**		Each	
	g)	65 mm nominal bore.	**51.0**		Each	
	h)	80 mm nominal bore.	**26.0**		Each	

218		Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI ; 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet,outlet and overflow pipes but without fittings and the base support for tank.	**458000.0**		per litre	
219		Providing and fixing tank nipples of following sizes in polyurethelene water storage tanks				
		FOR 1000 LITRE TANK				
	a)	20 mm dia inlet	**110.0**		Each	
	b)	25 mmdia overflow	**188.0**		Each	
	c)	32 mm scour	**163.0**		Each	
	d)	40mm dia outlet	**200.0**		Each	
220		Boring with 100 mm diameter casting pipe for hand pumb/tube well in all soils except ordinary hard rocks requiring blasting including removing the casing pipe after the hand pipe/tube well is lowered and tested.				
	a)	Upto 6 metres depth.	**90.0**		Metre	
	b)	Beyond 6 m and upto 12 m depth	**90.0**		Metre	
	c)	Beyond 12 m and upto 18 m depth	**187.0**		Metre	
221		Providing and placing in position fiters of 40 mm diameter G.I. pipe with brass strainer of approved quality.	**186.0**		Metre	
222		Providing and fixing to filter and lowering to proper levels 40 mm G.I. pipe for tube well including cleaning and pirming the tube well.	**204.0**		Metre	

223		Providing and placing in position hand pump of approved quality for 40 mm diameter G.I. pipe complete with all accessories.	**7.0**		Each	
224		Providing & fixing PTMT stop cock of approved quality and colour.				
	a)	15mm nominal bore, 86mm long. Weighing not less than 88 gms	**1757.0**		Each	
225		Providing and fixing PTMT bib cock of approved quality and colour.				
	a)	15mm nominal bore, 86 mm long. Weighing not less than 88 gms.	**40.0**		Each	
226		Providing and fixing PTMT grating of approved quality and colour.				
	a)	Circular type.				
		(i) 100 mm nominal dia.	**40.0**		Each	
227		Cutting holes upto 30x30cm in walls including making good the same.				
	a)	With F.P.S bricks	**262.0**		Each	
228		Making chases upto 7.5x7.5 cm in walls including making good and finishing with matching surface after housing G.I. pipes etc.	**709.9**		Metre	
229		Dismantling old C.I. Pipes including excavation and refilling trenches after taking out the pipes, breaking lead caulked joints, melting of lead and making into blocks including stacking of pipes at site lead upto 50 metre.				
	a)	80 mm diametre C.I. Pipe.	**181.0**		metre	

	b)	100 mm diametre C.I. Pipe.	**353.0**		metre	
230		Labour for cutting C.I. Pipe with steel saw.				
	a)	80 mm diametre C.I. Pipe.	**78.0**		each cut	
	b)	100 mm diametre C.I. Pipe.	**132.0**		each cut	
231		Cleaning of overhead PVC and RCC water storage tank of Various capacities by manual labour including providing necessary T&P such as for rubbing buckets, ladders and pumps and sand papers for rubbing walls and floors, removal of sludge and slit etc. from the tank with bleaching powder and then cleaning the tank with fresh water till clean water is seen in tank before the tank is put in operation.	**1000.0**		1000 litres	
232		Providing , laying and jointing glazed stoneware pipes grade 'A' with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete.				
	a)	100 mm diametre	**361.0**		Metre	
	b)	150 mm diametre	**837.0**		Metre	
	c)	200 mm diametre	**182.0**		Metre	
233		Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) alround S.W. pipes including bed concrete as per standard design.				

	a)	100 mm diametre S.W. Pipe	**827.0**		Metre	
	b)	150 mm diametre S.W. Pipe	**981.0**		Metre	
	c)	200 mm diametre S.W. Pipe	**182.0**		Metre	
234		Providing & fixing square - mouth S.W. gully trap grade 'A' complete with C.I grating brick masonry chamber with water tight C.I. Cover with frame of 300 x 300mm size (inside) the weight of cover to be not less than 4.50kg & frame to be not less than 2.70 kg as per standard design.				
		100 x 100 mm size P type				
	a)	with F.P.S. bricks class designation 75	**277.0**		Each	
235		Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete.				
	a)	150 mm dia R.C.C. Pipe	**1528.3**		Metre	
	b)	250 mm dia R.C.C. Pipe	**6438.4**		Metre	
	c)	300 mm dia RCC pipe	**1358.6**		Metre	
236		Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) upto haunches of RCC. pipes including bed concrete as per standard design.				
	b)	250 mm dia R.C.C. Pipe	**948.0**		Metre	
	c)	300 mm dia RCC pipe	**218.0**		Metre	

237		Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand :4 graded stone aggregate 20 mm nominal size) foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size) inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design.				
	1)	Inside size 90 x 80 cm and 45 cm deep including C.I. cover with frame (light duty) 455 x 610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg).	**294.0**		Each	
	a)	With FPS bricks of class designation 75				
	2)	Inside size 120 x 90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg).				
	a)	With FPS bricks of class designation 75	**230.0**		Each	
238		Extra for depth for manholes				
		Size 90x80 cm				
	a)	With F.PS bricks of class designation 75	**118.4**		Metre	

		Size 120x 90 cm				
	b)	With F.PS bricks of class designation 75	**126.3**		Metre	
239		Constructing brick masonry circular type manhole 0.91m intarnal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) in side cement plaster 12mm thick with cement moratr 1:3 (1 cement : 3 coarse sand)finishied with a floating coat of neat cement, foundation concrete 1:3:6 mix (1 cement :3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cementall complete as per standard design.				
	1	0.91 m deep with S.F.R.C. cover and frame (heavy duty, HD-20 grade designation) 560 mm internal dia meter conforming to I.S. 12592,total weight of cover and frame to be not less than 182 kg,, fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand:4 graded stone aggregate 20mm nominal size) including centering shuttering all complete. (Excavation, foot rests and 12mm thick cement plaster at the external surface shall be paid for separately)				
	a)	With F.P.S. bricks class designation 75	**61.0**		each	

240		Constructing brick masonary circular manhole 1.22m intarnal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) in side cement plaster 12mm thick with cement moratr 1:3 (1 cement : 3 coarse sand)finishied with a floating coat of neat cement, foundation concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement all complete as per standard design.				
	1	1.68 m deep with SFRC. cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter conforming to I.S. 12592,total weight of cover and frame to be not less than 182 kg,, fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand:4 graded stone aggregate 20mm nominal size) including centering shuttering all complete. (Excavation, foot rests and 12mm thick cement plaster at the external surface shall be paid for separately)				
	a)	With F.P.S. bricks class designation 75	**24.0**		each	
241		Extra depth for circuler type manhole 0.91m internal dia (at bottom) with beyond 0.91m to 1.67m				
	a)	With F.P.S. bricks class designation 75	**28.0**		Metre	

242		Providing orange colour safety foot rest of minimum 6mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23mm x 25mm and over all minimum length 263mm and width as 165mm with minimum 112mm space between protruded legs having 2mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent indentification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement :3 coarse sand :6 graded stone aggregate 20 mm nominal size) complete as per design.	**271.0**		each	
243		Providing and fixing in position precast R.C.C. manhole cover and frame of required shape and approved quality				
	1	H D -20				
	a)	Circular shape 560 mm internal diameter	**272.0**		each	
244		Dismantling of manhole including R.C.C. top slab, C.I. Cover with frame including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 m lead :				
	a)	Rectangular manhole 90x80 cm and 45 cm deep	**19.0**		each	
			nos			
	b)	Rectangular manhole 120x90 cm and 90 cm deep	**13.0**		each	

245		Constructing brick masonry road gul ly chamber 50 x 45 x 60 cm with bricks of class designation 75 in cement mortar 1:4 (1 cement : 4 coarse sand) including 500 X 450 mm precast R.C.C. horizontal grating with frame complete as per standard design:				
	a)	With F.P.S. bricks	**159.0**		each	
246		Constructing R.C.C septic tank including following associated works.				
	a)	Excavation (in all types of soil), back filling & disposal of surplus exca vated earth as directed at site.				
	b)	2nos. SFRC heavy duty manhole cover 600mm dia with lifting lugs & frame.				
	c)	Foundation conc. 1:2:4 .				
	d)	12mm thick 1:3 plastering on inside & rough plaster on outside.				
	e)	R.C.C top slab (1:2:4) suitable to handle vehicular load.				
		Size of septic tank -3.5x2x1.5m liquid depth	**10.0**		nos	
247		Making soak pit 2.5 m diameter 3.0 metre deep with 45 X 45 cm dry brick honey comb shaft with bricks of class designation 75 and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design.				
		With F.P.S. bricks	**5.0**		Each	

248		Providing,boring lowering and fixing 160mm dia UPVC (Working pressure - 6kg/sqcm) pipes with 3mm size slots depth as per drawing & direction of engineer in charge complete in all respects.Cost shall include approval from Ground Water Authority.	**834.2**		metre	
249		Supplying and filling in Rain water harvesting tank stone boulders 100 - 150 mm size including all associated works complete.	**168.7**		cum	
250		Supplying and filling in Rain water harvesting tank gravels 5 - 10 mm and down size including all associated works complete.	**162.7**		cum	
251		Supply pea-gravel of approved quality in stacks and then packing the same into the annular space between the tubewell assembly and bore hole.	**100.0**		cum	
252		Constructing Rain water desilting pit (size 2mx1m &0.6m effective depth) complete with all associated civil works like excavation in all kinds of soil/rock, backfilling, disposal of surplus excavated earth,brick work,cement concrete,RCC,water proof plaster, M.H covers,rungs etc complete as per detail drawing & instructions of engineer in charge	**57.0**		each	
253		Constructing Rain water harvesting tank (size 3.5 dia &1.25m effective depth) complete with all associated civil works like excavation in all kinds of soil/rock, backfilling, disposal of surplus excavated earth complete as per detail drawing & authority.	**38.0**		Each	

254		Supply & Filling in Rain water Harvesting Tank Coarse sand 1.5mm to 2.0mm i/c all associates.	**48.0**		cum	

Contractor **Executive Engineer CD-XX**

	Electrical upgradation of IIIrd cluster for 34 Nos. of Schools				
S.NO.	**DESCRIPTION OF ITEM**	**Total Qty.**	**RATE**	**UNIT**	**AMOUNT**
	SUBHEAD - I - WIRING				
1.01	Wiring for light point/fan point/exhaust fan point/call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed steel conduit,but without piano type switch, phenolic laminated sheet, suitable size M.S. box and earthing the point with 1.5 sq.mm FR PVC insulated single core cable as required.(Light and Fan points shall be controlled by MCB.The price of MCB is not included in the item.)(Group C)	6188.00		Each	
1.02	Wiring for light point/fan point/exhaust fan point/call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed steel conduit, with piano type switch, phenolic laminated sheet, suitable size M.S. box and earthing the point with 1.5 sq.mm FR PVC insulated single core cable as required.(Group C)	654.00		Each	

1.03	Rewiring for light point/fan point/exhaust fan point/call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed steel/PVC conduit, including dismantling as required (Group C)	6319.00		Each	
1.04	Wiring for light/power plug with 2 x 4 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed steel conduit alongwith 1 No 4 sq.mm FR PVC insulated copper conductor single core cable for loop earthing as required.	8115.00		Mtr.	
1.05	Wiring for light/power plug with 4 x 4 sq.mm FR PVC insulated copper conductor single core cable in surface/recessed steel conduit alongwith 2 No 4 sq.mm FR PVC insulated copper conductor single core cable for lop earthing as required.	5607.00		Mtr.	
1.06	Wiring for circuit/submain wiring alongwith earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				
a)	2 x 1.5 sq.mm + 1 x 1.5 sq.mm earth wire	9410.00		Mtr.	

b)	4 x 1.5 sq.mm + 2 x 1.5 sq.mm earth wire	5149.00		Mtr.	
c)	2 x 4 sq.mm + 1 x 4 sq.mm. earth wire	300.00		Mtr.	
d)	2 x 6 sq.mm + 1 x 6 sq.mm. earth wire	2440.00		Mtr.	
e)	4 x 6 sq.mm + 2 x 6 sq.mm. earth wire	90.00		Mtr.	
f)	4 x 10 sq.mm + 2 x 10 sq.mm. earth wire	150.00		Mtr.	
g)	2x10sqmm+1x10 sqmm earth wire	7561.00		Mtr.	
h)	2x16sqmm+1x16 sqmm earth wire	79.00		Mtr.	
1.07	Supplying and drawing following sizes of FR PVC insulated copper conductor, single core cable in existing surface /recessed steel/PVC conduit as required.				
a)	3x4 sqmm	2268.00		Mtr.	
b)	6x4 sq.mm	3364.00		Mtr.	

1.08	Supplying and fixing metal box of 150mm x 75mm x 60mm deep (nominal size) on surface or in recess with suitable size phenolic laminated sheet cover in front including providing and fixing 3 pin 5/6 Amp socket outlet and 5/6 Amp piano type switch, connections, painting etc. as required. (For light plugs to be used in non residential building).	289.00		Each	
1.09	Supplying and fixing metal box of 180mm x 100mm x 60mm deep (nominal size) on surface or in recess with suitable size phenolic laminated sheet cover in front including providing and fixing 6 pin 5/6 & 15/16 Amp socket outlet and 15/16 Amps piano type switch, connections, painting etc.as required. (For power plugs).	934.00		Each	
1.10	Supplying & drawing following sizes of FR PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/PVC conduit as required.				
a)	2 x 1.5 sq.mm + 1 x 1.5 sq.mm earth wire	4867.00		Mtr.	
b)	4 x 1.5 sq.mm + 2 x 1.5 sq.mm earth wire	5052.00		Mtr.	
c)	2 x 4 sq.mm + 1 x 4 sq.mm earth wire	320.00		Mtr.	

1.11	Suplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a)	20 mm	620.00		Mtr.	
b)	25 mm	3485.00		Mtr.	
c)	32mm	435.00		Mtr.	
1.12	Supplying and fixing metal box of following sizes (nominal size) on surface or in recess with suitable size of phenolic laminated sheet cover in front including painting etc. as required.				
a)	75 mm x 75 mm x 60 mm deep	19.00		Each	
1.13	Suplying & drawing following pair, 0.5 sq.mm FR PVC insulated copper conductor, unarmoured telephone cable in the existing surface/recessed steel/ PVC conduit as required.				
a)	4 Pair	550.00		Mtr.	
1.14	Supplying & fixing follwong piano type switch/socket on the existing switch box/cover including connections etc. as required.				
a)	Telephone socket outlet	19.00		Each	

1.15	Supplying & fixing 20 amps, 240 volts, SPN industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 amps 'C' series, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	73.00		Each	
	TOTAL OF SUBHEAD - I				
	SUBHEAD - II - SUPPLY & INSTALLATION OF FITTINGS AND FANS				
2.01	Installation, testing and commissioning of pre-wired fl. fitting / compact fluorescent fitting of all types, complete with all accessories and tube etc. directly on ceiling / wall, including connection with 1.5 sq.mm. FR PVC insulated, copper conductor, single core cable and earthing etc. as required.	6621.00		Each	
2.02	Installation, testing and commissioning of ceiling fan including wiring the down rod of standard length (upto 30 cm.) with 1.5 sq.mm FR PVC insulated, copper conductor single core cable etc. as required.	3376.00		Each	
2.03	Numbering of ceiling fan/exhaust fan/ fluorescent fitting as reqd.	12324.00		Each	

2.04	Installation of Exhuast Fan upto 450 mm sweep in the existing opening, including making the hole to suit the size of the above fan, making good the damage, connections, testing, commissioning etc. as required.	600.00		Each	
2.05	Extra for fixing the louvers/shutters complete with frame for a exhaust fan of all sizes.	600.00		Each	
2.06	Erection of wall bracket/ceiling fittings of all sizes and shapes containing upto two GLS/CFL lamps per fitting, complete with all accessories including connection etc. as required.	2079.00		Each	
2.07	Replacement of set of blades in all makes of existing ceiling fans of1200/1400 mmsweep including dismantling and handing over of existing blades to representative of DSIDC.	927.00		Set	
2.08	Rewinding of Existing ceiling fans with good quality copper enamelled wire after removal of fan and re fixing in position after testing etc. complete as required.	978.00		Each	

2.09	Servicing and Overhauling of all makes of ceiling fans of 1200mm/1400mm sweep ceiling fans including oiling,greasung,replacement of thorough bolts,insulating reel,cotter pins after removing from installed position and re fixing the same in position after overhauling and servicing	1421.00		Each	
2.10	Supplying and fixing brass batten / angle holder including connection etc. as required.	12.00		Each	
2.11	Carriage of ceiling fan and regulator/exhaust fan from store to site as required.	0.00		Each	
2.12	Supplying & Fixing stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	440.00		Each	
2.13	Supply of following box type fitting suitable for T - 5, 28 W lamp. The fitting shall be complete with energy efficient fluorocent tube light fittings electronic ballast and lamp holder duly wiredup ready for volts single phase 50 Hz AC supply to IS 10322 as per quality requirement (But to be supplied without lamps)				
a	Single (1 x T - 5, 28 W lamp)	81.00		Each	

2.14	Supply of bulk head fittings suitable for 9 W CFL lamp complete with ballast and accessories such as glass, wire guard, 9 W CFL lamp etc as required	20.00		Each	
2.15	Supplying of following as required				
a	T - 5, 28 W lamp	81.00		Each	
b	9 W CFL lamp	20.00		Each	
2.16	Supplying of Propellor type AC ventilating fan (Exhaust Fan) confirming to IS - 2312 / 1967 with amendment 1 to 5, complete with mounting ring frame i/c bracket, but witout regulator with shutters in the following sizes				
a	300 mm 4 pole	8.00		Each	
2.17	Supplying of 1400 mm sweep AC electric Ceiling fans, capacitor type with double ball bearing complete with 300 mm down rod, canopies, shackles, blades, but without regulator suitable for operation on 230 / 240 Volts, 50 hz, Single phase, AC supply etc as required	60.00		Each	
	TOTAL OF SUBHEAD - II				
	SUBHEAD - III - BOARDS, DISTRIBUTION BOARDS AND CABLES				

3.01	Supply,installation,testing & commissioning of 200 A -50KA breaking capacity TPN MCCB with thermal magnetic release in sheet steel enclousure complete with provision for incoming cable from supply company and outgoing cable to the school panel.	27.00		Each	
3.02	Supply,installation,testing & commissioning of 200 A TPN MCCB in sheet steel enclousure complete with provision for incoming cable from supply company and outgoing cable to the school panel	0.00		Each	
3.03	Supplying, installing, testing & commissioning of compartmentalised cubicle board made from 2mm thick CRCA sheet dust & vermin proof duly phosphatized & painted inclusive of suitable size 4 strip Al. Busbar complete with interconnection pdg (Depth of panel upto 30 cm) . Lugs, inter-earthing, painting etc. i/c pdg. & fixing below noted accessories :				
(A)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				

a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -3 Nos.				
		1.00		Set	
(B)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-9 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
f)					
		1.00		Set	
	MAIN LT PANEL AT METER ROOM				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				

	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -11 Nos.	1.00		Set	
(D)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-9 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-12 Nos.				
		1.00		Set	
(E)	**MAIN LT PANEL AT METER ROOM**				

	Incomer				
1	100 Amp FP MCCB 25 KA				
	Out Going				
1	100/63 Amp FP MCCB 25 KA-1 Nos.				
2	Metering -Ammeter ,Volt Meter etc.-1 Set				
3	63 Amp DP Isolator-2 Nos				
4	63 Amp TP Isolator-2 Nos.				
f)					
		1.00		Set	
(F)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-7 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-5 Nos.				
		1.00		Set	
(G)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				

1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -3 Nos.				
		1.00		Set	
(H)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -8 Nos.				
		1.00		Set	
(I)	**MAIN LT PANEL AT METER ROOM**				

	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -9 Nos.				
		1.00		Set	
(J)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-7 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-	1.00		Set	
c)	Voltmeter and Ammeter selector switch-				

d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-7 Nos.				
		1.00		Set	
(K)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TP MCCB 50 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-7 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -10 Nos.				
		1.00		Set	
(L)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-6 Nos.				
2	**Metering comprising of following**				

a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-	1.00		Set	
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-14 Nos.				
		1.00		Set	
(M)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-3 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -9 Nos.				
		1.00		Set	
(N)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				

	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-3 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -14 Nos.				
		1.00		Set	
(O)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-6 Nos.				
		1.00		Set	

(P)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-10 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-6 Nos.				
		1.00		Set	
(Q)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TP MCCB 50 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-7 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				

d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -10 Nos.				
		1.00		Set	
(R)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-6 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -6 Nos.				
		1.00		Set	
(S)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-5 Nos.				
2	**Metering comprising of following**				

a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -7 Nos.				
		1.00		Set	
(T)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TPN MCCB 25 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-4 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	63 Amp DP MCB-18 Nos.				
	-	1.00		Set	
(U)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				

	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-3 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -13 Nos.	1.00		Set	
(V)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-8 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB- 6 Nos.	1.00		Set	
(X)	**MAIN LT PANEL AT METER ROOM**				
	-				

1	200 Amp TPN MCCB 50 KA with thermal magnetic release -1 No.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-7 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-200Amp--1 No..				
b)	Voltmeter-0-500 Volts-3 No.-				
c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -10Nos.				
		1.00		Set	
(Y)	**MAIN LT PANEL AT METER ROOM**				
	INCOMING :				
	200Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-200 A) Ammeter with selector switch & 200/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	100 Amp TPMCCB -2 Nos.				
	63 Amp TPMCCB -5 Nos.				
	63 Amp SPNMCB - 3 Nos.				
		1.00		Set	
(Z)	**MAIN LT PANEL AT METER ROOM**				

	INCOMING :				
	160Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-160 A) Ammeter with selector switch & 160/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	100 Amp TPMCCB having breaking capacity - 25 KA- 1 Nos.				
	63 Amp TPMCCB having breaking capacity - 25 KA- 2 Nos.				
	63 Amp SPNMCB having breaking capacity - 5 Nos.				
	40 Amp SPNMCB - 6 Nos.				
		1.00		Set	
(AA)	**MAIN LT PANEL AT METER ROOM**				
	INCOMING :				
	200Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-200 A) Ammeter with selector switch & 200/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	160 Amp TPMCCB having breaking capacity - 35 KA- 1 Nos. **(Provision for new Building.)**				

	125 Amp TPMCCB having breaking capacity - 35 KA - 1 Nos.				
	63 Amp TPMCCB having breaking capacity - 25 KA - 2 Nos.				
		1.00		Set	
(AB)	**MAIN LT PANEL AT METER ROOM**				
	INCOMING :				
	200Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-200 A) Ammeter with selector switch & 200/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	100 Amp TPMCCB having breaking capacity - 25 KA- 2 Nos.				
	63 Amp TPMCCB having breaking capacity - 25 KA- 2 Nos.				
	63 Amp SPNMCB - 6 Nos.				
		1.00		Set	
(AC)	**MAIN LT PANEL AT METER ROOM**				
	Incomer				
1	100 Amp TP MCCB 25 KA with thermal magnetic release-1 Nos.				
	Out Going				
1	100/63 Amp TP MCCB 25 KA with thermal magnetic release-3 Nos.				
2	**Metering comprising of following**				
a)	CT operated Ammeter 0-100Amp--1 No..				
b)	Voltmeter-0-500 Volts-1 No.-				

c)	Voltmeter and Ammeter selector switch-				
d)	CT's with CT Ratio 200/5- 3 Nos. ,Toggle switch-2 Nos.,Indication Lights-3 Nos.,Protection fuses with base -1 Set..				
e)	DP MCB -6 Nos.				
		1.00		Set	
(AD)	**MAIN LT PANEL AT METER ROOM**				
	INCOMING :				
	160Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-160 A) Ammeter with selector switch & 160/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	100 Amp TPMCCB having breaking capacity - 25 KA - 1 Nos.				
	63 Amp TPMCCB having breaking capacity - 25 KA - 3 Nos.				
	63 Amp SPNMCB - 6 Nos.				
		1.00		Set	
(AE)	**MAIN LT PANEL AT METER ROOM**				
	INCOMING :				
	160 Amp FP MCCB having breaking capacity - 35 KA - 1 No.				
	(0-160 A) Ammeter with selector switch & 160/5 C.T.'s (Digital type) - 1 Set				

	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	63 Amp TPMCCB -25KA - 4 Nos.				
	63 Amp SPNMCB - 6 Nos.				
		1.00		Set	
(AF)	**MAIN LT PANEL AT METER ROOM**				
	INCOMMING				
	160 Amp FP MCCB having breaking capacity 35 KA - 1No				
	(0-160 A) Ammeter with selector switch & 160/5 C.T.'s (Digital type) - 1 Set				
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set				
	Indication lamp R/Y/B with backup fuses - 1 Set of three				
	OUTGOING :				
	63 Amp TPMCCB having bearing capacity -25KA - 3 Nos.				
	63 Amp SPNMCB - 10 Nos.	1.00		Set	
		set			
3.04	Supply,installation,testing & commissioning of 160 A TPN MCCB in sheet steel enclousure complete with provision for incoming cable from supply company and outgoing cable to the school panel	1.00		Each	
		Set			

3.05	Supplying, installing, testing & commissioning of compartmentalised cubicle board made from 2mm thick CRCA sheet dust & vermin proof duly phosphatized & painted inclusive of suitable size 4 strip Al. Busbar complete with interconnection pdg (Depth of panel upto 30 cm) . Lugs, inter-earthing, painting etc. i/c pdg. & fixing below noted accessories :		-	-	-
(AA)	**MAIN LT PANEL AT METER ROOM**		-	-	-
	INCOMING :		-	-	-
	160Amp FP MCCB having breaking capacity - 35 KA - 1 No.		-	-	-
	(0-160 A) Ammeter with selector switch & 160/5 C.T.'s (Digital type) - 1 Set		-	-	-
	(0-500 V) Voltmeter with selector switch (Digital type) - 1Set		-	-	-
	Indication lamp R/Y/B with backup fuses - 1 Set of three		-	-	-
	OUTGOING :		-	-	-
	63 Amp TPMCCB having breaking capacity - 35 KA- 3 Nos.		-	-	-
	63 Amp SPNMCB - 9 Nos.	1.00		Set	
		Set	-		-
3.06	Supplying and fixing following rating, double pole, 240/415volt , isolator in the existing MCB DB complete with connections, testiings and commissioning etc. as required				
a)	40 amps DP Isolator	20.00		Each	
		Nos.			
b)	63 amps DP Isolator	27.00		Each	
3.07	Supplying and fixing following rating, double pole, 240 volt , isolator/mcb in the existing MCB DB compte with connections, testiings and commissioning etc. as required				
a)	40 amps SP&N Isolator	2.00		Each	
b)	63 amps SP&N Isolator	4.00		Each	

c)	40A DP MCB	127.00		Each	
d)	63 A DP MCB	412.00		Each	
3.08	Supplying and fixing following rating, four pole, 415 volt , isolator in the existing MCB DB compte with connections, testiings and commissioning etc. as required.				
a)	63 Amps	3.00		Each	
b)	100 Amps	0.00		Each	
3.09	Supplying and fixing following rating,following pole, 240/415 volt, MCB in the existing MCB DB compte with connections, testiings and commissioning etc. as required				
a)	40 amps SPMCB	18.00		Each	
b)	63 amps SPMCB	28.00		Each	
c)	63 amps TPMCB	0.00		Each	
3.10	Providing and fixing following rating and breaking capacity MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.				
	100 Amp, 16 KA	16.00		Each	
3.11	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	10.00		Each	

3.12	Supplying and fixing 5 amps to 32 amps rating, 240 volts, 'C' series, miniature circuit breaker suitable for lighting and other loads of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	Single pole	4345.00		Each	
b)	Single pole &Neutral	2279.00		Each	
3.13	Supplying & fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 volts, on surface/recess, complete with tinned copper busbar, neutral busbar, earth busbar, din bar, detachable gland plate, interconnections, phosphatized and powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	8 way, Double door	94.00		Each	
b)	12 way, Double door	120.00		Each	
c)	16 way, Double door	201.00		Each	

3.14	Supplying & fixing following way, three pole and neutral, sheet steel, MCB distribution board consumer unit, 415 volts, on surface/recess, complete with tinned copper busbar, neutral busbar, earth busbar, din bar, detachable gland plate, interconnections, phosphatized and powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	4 way (4 + 12), Double door, horizontal type	8.00		Each	
b)	6 way (4 + 18), Double door, horizontal type	14.00		Each	
3.15	Supplying & fixing following way, single pole and neutral,prewired, sheet steel, MCB distribution board, 240 volts, on surface/recess, complete with loose wire box, terminal blocks, tinned copper busbar, neutral busbar, earth busbar, din bar, detachable gland plate, interconnections, including powder coat painting, earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	4 way double door	1.00		Each	
b)	12 way double door	3.00		Each	

3.16	Supplying, installing, testing, and commissioning of surface/recess mounting, vertical type, 415 volts, TPN MCB distribution board of sheet steel, dust protected, duly phosphatized and powder painted, inclusive of 200 amps tinned copper busbar, common neutral link, earth bar, din bar for mounting MCB's detachable gland/knock out plate, and with 100 amps, 10 KA MCCB as incomer interconnection between incomer MCCB and busbars of following ways (but without MCB's) as required.				
a)	4 way with 100 amps MCCB as incomer	46.00		Each	
3.17	Supplying and installation of sheet metal box suitable for Two Nos.-SP & N MCB to be installed outside the rooms complete with wire mesh to avoid any breakage or pilferage etc. as required.	1515.00		Each	

3.18	Supplying & fixing following way, three pole and neutral, sheet steel, MCB distribution board consumer unit, 415 volts, on surface/recess, complete with tinned copper busbar, neutral busbar, earth busbar, din bar, detachable gland plate, interconnections, phosphatized and powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	8 way (4 + 24), Double door	0.00		Each	
3.19	Supplying and fixing following way, three pole and neutral, prewired, sheet steel, MCB distribution board, 415 volts, on surface/recess, complete with loose wire box, terminal blocks, duly prewired with suitable size FR PVC insulated copper busbar, neutral link, earth bar, din bar, detachable gland plate, interconnections, phosphatized and powder painted including earthing etc. as required.(But without MCB/RCCB/Isolator)				
a)	4 way (4 + 12), Double door	0.00		Each	
3.20	Supplying and installation of sheet metal box suitable for SPN / DP / SP / TPN / FPMCB to be installed outside the rooms complete with wire mesh to avoid any breakage or pilferage etc. as required.	227.00		Each	

3.21	Supplying of XLPE insulated, PVC sheathed 1.1 KV grade Aluminium conductor heavy duty armoured cable as per IS : 7098 of size :				
a)	2 x 6 sq.mm.	100.00		Mtr.	
b)	2 x 10 sq.mm.	984.00		Mtr.	
c)	4 x 16 sq.mm.	2945.00		Mtr.	
d)	4 x 25 sq.mm.	0.00		Mtr.	
3.22	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
a)	2 x 6sq.mm.	2.00		Set	
b)	2 x 10 sq.mm.	12.00		Set	
c)	4 x 16 sq.mm.	88.00		Set	
d)	4 x 25 sq.mm.	2.00		Set	
3.23	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade, of size not excedding 25 sq.mm. on surface as required.	1937.00		Mtr.	

3.24	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of size not exceeding 25 sq.mm. direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.	2202.00		Mtr.	
3.25	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of size not exceeding 25 sq. mm in the existing RCC/ HUME/ STONEWARE/ METAL pipe as required.	174.00		Mtr.	
3.26	Supply, Instllation, testing and commissioning of 160 A TPN MCCB in sheet steel enclousure complete with provision for incoming cable from company and outgoing cable to the school panel.	1.00		Each	
	TOTAL OF SUBHEAD - III.				
	SUBHEAD IV - EARTHING				
4.01	Earthing with G.I. earth pipe 4.5 mtr. Long, 40 mm dia including accessories, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal and salt as required.	79.00		Set	

4.02	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/ submain wiring/cable as required.	21582.00		Mtr.	
4.03	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode, as required.	440.00		Mtr.	
4.04	Providing & fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	482.00		Mtr.	
4.05	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick Including accessoires, & providing masonary enclosure with cover plate having locking arrangement & watering pipe etc. (but without charcoal or coke and salt) as required.	4.00		Set	
4.06	Extra for using salt and charcoal for pipe earth electrode as required.	8.00		Set	
4.07	Extra for using and salt and charcoal for G.I or copper plate earth electrode as required.	4.00		Set	
	TOTAL OF SUBHEAD - IV.				
	SUBHEAD - V - EXTERNAL ELECTRIFICATION				

5.01	Supplying and installation of Street Light fitting suitable for 70 W HPSV lamp with IP-66 protection to be installed with bracket made up of GI pipe of 50 mm dia.The fitting shall be complete with integral controlgear box with electromagnetic copper wound ballast, ignitor, capacitor wired with heat resistant wire but without 70 W HPSV lamp complete as reqd. **(Philips Cat No. SRP 308/70(E))**	40.00		Set	
5.02	Supplying & fixing of weather proof box of size 200 x 160 x 90mm polycarbonate box complete with earth stud, locking arrangement & mounting clamps. The box shall be provided with 4 way connector DPMCB, pdg. with din channel. The box shall be suitable for 2 nos. opening suitable for 4 core 10 sq.mm armoured cable. The box shall be IP : 65 protection etc. as reqd.	323.00		Each	
5.03	Supplying and fixing of G.I. pipe of 50 mm dia. (nominal) 3 metres length along the pole for protection of under ground cable as required.	40.00		Each	
5.04	Supplying, integral type flood light luminaire with pressure die cast aluminium housing (IP - 65) suitable for 1 No. 150 watts MH lamp.The fitting shall be complete with lamp,ballast etc. as reqd.	277.00		Each	

5.05	Installation,testing and commissioning of integral type flood light luminaire suitable for 150 Watt Metal halide Lamp including wiring with 2x4 +1x4 sqmm PVC insulated copper conductor single core cable in PVC flexible pipe .The job shall include fabrication and fixing of MS enclosure of size 300x300x375mm made out of 25x25x3mm M.S.Angle Iron frame work and covered with expanded metal meshand having provision for openable door with locking arrangement .Enclosure shall be provided with earthing stud for earthing etc. complete as required.	277.00		Each	
5.06	Supplying of XLPE insulated, PVC sheathed 1.1 KV grade Aluminium conductor heavy duty armoured cable as per IS : 7098 of size :				
a)	4 x 10 sq.mm.	150.00		Mtr.	
b)	2 x 6 sq.mm.	9319.00		Mtr.	
5.07	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of size not exceeding 25 sq.mm. direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.	2247.00		Mtr.	

5.08	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade, of size not excedding 25 sq.mm. on surface as required.	7008.00		Mtr.	
5.09	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade, of size not excedding 25 sq.mm. in the existing RCC/HUME/STONEWARE/METAL pipe as required.	209.00		Mtr.	
5.10	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
a)	4 x 10 sq.mm.	8.00		Set	
b)	2 x 6 sq.mm.	639.00		Set	
5.11	Supplying of 70 W HPSV lamp.	57.00		Each	
5.12	Providing and Laying non pressure NP - 2 class RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete as reqd.	742.00		Mtr.	

Contractor **Executive Engineer ED -I**

GENERAL SPECIFICATIONS AND GENERAL CONDITIONS

1. This being a work of involving repair s, refurbishment, rehabilitation, retrofilling besides new construction etc. construction schedule shall be made in such a manner that there is no disturbance in the functioning of school. The work is to be carried out in clear co-ordination with school authorities/ Principal. Prior information and action plan is to be given to the Principal. Contractor shall provide barricating for segregation of construction area, secured shading of material etc. to prevent any accident and at the same time without causing any inconvenience, nuisance to the school functioning.

2. The entire works shall be done as per CPWD specifications for Delhi 1996 Vol. I to VI and revised CPWD specification 2002 for cement mortar, cement concrete & R.C.C. Work in pursuance to I.S. 456-2000 with upto date correction slips upto the date of receipt of tender if the specifications for any item are not available in the CPWD specification referred above relevant ISI specifications shall be followed. In case, ISI specifications are also not available, the decision of the Engineer-in-charge, given in writing shall be final

3. Whenever any reference to any Indian standard specifications occurs in the document relating to this contract the same shall be inclusive of all the amendments issued there to or revisions there if any upto the date of receipt of tenders.

4. The work shall be carried out in the manner complying in all respects with requirement of relevant bye-laws or the local bodies under the jurisdiction of which the entire work is to be executed or as directed by the Engineer-in-charge and nothing extra will be paid on this account.

5. The contractor shall carry out performance tests of entire installation as per standard specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the tests.

6. The contractor shall be responsible to arrange at his own cost all necessary T&P required for the execution of work.

7. The contractor shall make his own arrangement for temporary water connection, however if required the same shall be provided by the deptt. and recovery @ 1% shall be made from the bill.

8. The contractor shall be deemed to have fully acquainted himself with the nature and extent of the work and working conditions at site before submitting the tender. Besides construction, the work also involves refurbishment, retrofitting, rehabilitation of RCC, seismic compliances and unforeseen items of work. The work is required to be executed with utter diligence in a time bound manner complete as per instructions & preference given by Engineer-in-charge. If the materials drawing, designs etc. are not available due to any conditions the program of the contractors shall be modified accordingly and no compensations/damages shall be payable.

9. The contractor shall take all precautions by exhibiting necessary caution boards, red flags, red lights, and barriers to avoid any accident during execution of work. The contractor shall be responsible for all damages and accident due to negligence on his part.

10. No payment will be made to the contractor for damages caused by rains or other natural calamities or riots during execution of the work and no claims on this account will be entertained.

11. The rates of all items of work shall, unless clearly specified otherwise, are including cost of all labour, material and other inputs involved in the execution of the item.

12. The contractor shall make all efforts to mechanize the construction work to maximum possible extent by using the latest T&P/machinery and equipment etc. He shall use steel scaffolding and shuttering whenever, this is not possible the other type of shuttering used shall be of proper size and shape. Similarly, scaffolding other than steel shall be as per the site requirement and approval of Engineer-in-charge. The contractor with relation to site requirement shall arrange the adequate quality of shuttering and scaffolding. No time lag on this account shall be allowed. All safety arrangement is to be taken care of by the contractor to avoid any accident in the use of shuttering and scaffolding etc.

13. The time of completion shall be essence of the contract and to be strictly adhered to by the contractor. No time and cost over-run shall be allowed including interruption due to rains or otherwise.

14. The contractor should make necessary arrangement for round the clock working including working on Sundays and holidays except National holidays. The planning should be done accordingly.

15. The contractor shall provide at his own cost all the instruments including surveying etc. required for the purpose of checking at the site of work.

16. The various items of the work shall be taken simultaneously wherever possible to speed up the work. Nothing extra shall be paid on this account.

17. The contractor shall make arrangement for sufficient quantity of all the building materials required for construction of work including cement, steel window frames etc. conforming to required/related specifications. The materials for non-scheduled items shall be procured by the contractor from the approved vendors as per the list appended.

18. All arrangement required for power and electricity is to be done by the contractor. The payment for electric connection and consumption etc. to be borne by the contractor.

19. The contractor shall make necessary arrangement for medical aid to all his workers including availability of first-aid-box all the time at the site of work.

20. The contractor shall maintain in good conditions all work during execution till completion of entire work allotted to him.

21. The rates of different items of work shall apply for all heights and depths unless otherwise specified and no such claims on this account shall be entertained.

22. Tenders with conditions including conditional rebate shall be rejected forthwith.

23. Nothing extra whatsoever shall be payable to the contractor for executing the work as per general specifications and special conditions referred in all the above paras.

24. Payment of 1% cess to the Labour Deptt. as per "Building & other construction workers welfare Act 1996" shall be borne by the contractor.

25. The design and drawing may be revised at any time during execution of work by competent authority and no claim will be entertained on this account.

26. Even ISI marked material may be subjected to the quality test at the discretion of the Engineer-in-charge. Whenever ISI marked materials are brought to the site of work the contractor shall, if required by the Engineer-in-charge, furnish manufacturers test certificate or test certificate from approved lab, conforming to the provision of relevant IS Codes. However cement / steel will be necessarily tested.

27. During the progress and/or Completion of work, the Third Party technical audit for quality shall be conducted by M/S IL&FS-ETS and the Contractor shall be bound to comply with the observations without any demur to the Contract Conditions.

28. Demolition work shall be carried out without causing any disturbance to the functioning of school, preferably it shall be done after working hours or on Sundays and holidays.

29. The contractor has to submit computerized bills along with each measurement book at various stages of submission of bills for payments.

SPECIAL CONDITIONS

1. All materials obtained from dismantling or demolition shal l be the property of the department as mentioned in the Bill of Quantities. Special care shall be taken to remove the same from the site on the same day or stack it properly at a designated space for not more than two days, as directed by the Engineer -in-Charge. In case the same is found on site after the period stipulated, the Engineer-in-Charge shall have the authority to get the same cleared at the risk and cost of the Contractor.

2. The demolition shall always be well planned before hand and shall general ly be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer -in-charge before starting the work. Due care shall be taken to maintain the safety measures prescribed in IS: 4130

3. All precautions shall be taken to keep down the dust nuisance to the minimum.

4. Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully remov ed first. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer -in-Charge.

5. The contractor shall maintain/Disconnect existing essential services like electricity, water etc., whether temporary or permanent, where required by the Engineer-in-Charge and the same shall not in any way hinder the activities of the running school or the contractor shall have to make alternative arrangements for the same at no ex tra cost. All his quoted rates shall deemed to have included the same.

6. Special care shall be taken about housekeeping as directed by the engineer in charge. The debris/ malba generated in a day shall be removed from the site on daily basis irrespective of the truck-load. All his quoted rates shall deemed to have included the same.

7. Special care shall be taken to co -ordinate the operations with the preferences/ schedules as agreed to by the school authorities, in association with the Engineer-in-Charge.

8. Stacking of all construction material shall be done only on the designated spaces as approved by the Engineer-in-Charge in close co-ordination with the Principal and nothing extra shall be paid on this account. The rates quoted by the contractor shall be deemed to have included all such operations.

9. Special care shall have to be taken to prevent stagnation of water anywhere in the campus due to construction activity. In case the same is found the Engineer-in-Charge shall have the authority to get the same cleaned at the risk and cost of the Contractor.

10. Due care shall be taken to strictly adhere to the safety code, as per general conditions of contract.

11. This being a special work involving repairs, refurbishment, rehabilitation of damaged RCC, retrofitting, besides new construction special care shall have to be taken not to damage the adjoining areas. All such damages, caused if any, shall be recovered from the contractor.

12. Barricading shall be provided before undertaking construction work, as per directions of Engineer-in-Charge. The rates quoted by the contractor shall be deemed to have included such operations and nothing extra shall be payable to the Contractor on this account.

13. In case of dewatering of sub soil water/rain water during execution of work, the contractor shall have to make necessary arrangements including stand by pumps to ensure uninterrupted execution of work. The rates quoted by the contractor shall be deemed to have included all such operations and nothing extra shall be payable on this account.

14. The contractor shall provide a laboratory with requisite instruments at the site of work as per requirement of the Engineer-in-Charge.

15. The decision of the Engineer in charge shall be final and binding on all of the above.

SPECIAL SPECIFICATIONS

1. **The Chipping of weak/unsound concrete in chajjas.**
    a. The Chipping of weak/unsound concrete (as marked by the Engineer in charge at site) with power driven chisel or pneumatic chisel as required.
    b. The depth of the concrete chiseled shall be 50mm average depth and it shall include saw cutting of all edges making square shoulders of cavities
    c. Preparation of the adjoining areas with steel props and bracing with steel/timber to relieve the member from load coming on to it.
    d. The item includes steel scaffolding with a complete working platform.
    e. The disposal of the rubbish upto a lead of 50m

2. **Grinding and Polishing**
    a. Grinding and Polishing – CPWD specifications 1.11.13 is to be followed

3. **Drilling holes in the RCC –**
    a. Drilling holes in the RCC with pneumatic drill on the areas earmarked by the Engineer in charge
    b. Inserting mild steel shear key bars in existing RCC of required length & dia as shown in the drawings and directions of the engineer in charge of site. The actual number of holes shall be measured and paid for after the Engineer in charge is fully satisfied of the work executed.

4. **Cleaning reinforcement of concrete and rust –**
    a. Cleaning reinforcement of concrete and rust shall be done all round including removing concrete from the reinforcement bars with power driven pneumatic chisel
    b. The cleaning shall be done to an average 25 mm but not less than 15mm alround by hammering using wire brushes, chiseling etc
    c. Application of alkaline rust remover on rusted reinforcement such as rusticide with paint brush and removing loose particles on the areas earmarked by the Engineer in charge. After 24 hours of its application cleaning with wire brush and applying priming coat of acrylic polymer and cement in ratio 1:1.5 in 2 coats at an interval of minimum 4hrs. The work is to be executed to the satisfaction of the Engineer in charge. The length of the reinforcement on which the work is executed is to be measured and paid.

5. **Providing, mixing and applying bonding coat of approved epoxy adhesive -**Providing, mixing and applying bonding coat of approved epoxy adhesive as`per specifications of manufacturer, as per the area marked by the Engineer in charge. The item is to be completed in all respects and paid for after the Engineer in charge is fully satisfied of the work executed.

6. **Providing, mixing and applying over reinforcement bars zinc rich anti rust agent –**

   Providing, mixing and applying over reinforcement bars zinc rich anti rust agent approved products like CICO- Zincilate 500/Fosroc Nitrozinc, as per manufacturer's directions. The area shall be marked by the Engineer in charge and paid for after the Engineer in charge is fully satisfied of the work executed.

7. **Cleaning exposed concrete surface of work and foreign materials –**
   a. First Course : by means of sand blasting with coarse sand
   b. Second Course : by cleaning with free cold air blast upto a height of 30 metres above plinth level.
   c. This will include the steel scaffolding with working platform as per design given by the contractor and approved by the Engineer in charge.

   The item is to be completed in all respects and paid for after the Engineer in charge is fully satisfied of the work executed.

8. **Repair to cement concrete of RCC works –**
   a. Providing rabbit mesh and binding with wire to reinforcement
   b. Filling undulations and rough plaster with cement concrete of mix 1:1.5:3 (1 cement : 1.5 coarse sand : 3 stone aggregate 6 mm nominal size)
   c. Applying cement slurry @2.2Kg/sqm
   d. Plastering with 6mm thick cement plaster of mix 1:3 (1 cement : 3 fine sand) including all necessary scaffolding
   e. Disposal of rubbish to the dumping ground within 50 meter lead

   The area shall be marked by the Engineer in charge and paid for after the Engineer in charge is fully satisfied of the worth executed.

9. **Repair to damaged concrete from all round the rusted / corroded reinforced bars**

a. Dismantling damaged concrete
b. Cleaning the rust from reinforcement with the help of wire brush Jute cloth etc.
c. Providing & fixing rabbit wire mesh to the ceiling with "U" clips and wires applying a coat of cement slurry @ 2.00 Kg/sqm on the ceiling
d. Plastering the surface smooth in 2 layers. The under layer shall consist of 20mm thick cement plaster 1:4 (1 cement : 4 coarse sand) furrowing the under layer with scratching tool & furrowing shall be done diagonally both ways and shall be about 2 mm deep. The scratched lines shall be not more than 10mm apart. Applying the cement slurry on the under layer @ 2.00Kg/sqm & top layer 15 mm cement plaster 1:4 (1 cement : 4 coarse sand). The top layer shall be applied within one or two days of application of first layer. After one day of application of top layer, curing compound of approved brand and manufacture shall be applied,

The item has to be completed to the satisfaction of Engineer in charge

Pneumatic Cistern :

1. **Pneumatic Cistern :** The cistern manufactured should be single flush with square actuator and must have a Delrin valve for the inlet. The bore should be at 32. mm to give an operating head of 10kg/sq cm. If the requirement of an operating head of 3.0Kg/sq cm, it has to be installed at a bore of 5mm by substituting the white nozzle in the delrin valve in place of the red nozzle. The outlet valve is beta valve design with an attachment to respond to a pneumatic signal

   The item shall include the following :
   a. PVC 18" long & dia : 16 mm pipe
   b. Corrugated pipe 1 metre
   c. Coupling
   d. Elbow
   e. Clip
   f. Pan had screw 8 x 32 with rawl plug
   g. CSK head screw 6 x 32 with rawl plug
   h. Pan head screw 6 x 19
   i. Wall bracket strip
   j. Actuator assembly
   k. Air hose pipe 3 meter

l. Concealed Box
m. Knob cover
n. Outlet cup – 1.5", backup washer
o. H/L – Outlet pipe with "O" ring
p. 4" PVC pipe extra

The item is to be completed in all respects as per recommendations by the manufacture. The payment shall be made in Nos.

Green Chalk Board :

1. **Green Chalk Board :** Providing and fixing ceramic steel chalk writing board in green colour as per following specifications and directions of the Engineer in charge
   q. The writing top surface shall be made of CRC steel sheet of thickness 0.3 to 0.4 mm and shall have vitreous enamel coating of minimum 95 microns thickness on top and 35 microns thickness at the base.
   r. The board shall have approved PVC corners and round frame of anodized extruded aluminium alloy hollow section designation 63400 as per IS: 1285/1975 or IS : 733/1983. The frame section shall be front – 20mm, side 16mm and wall thickness 1.2mm
   s. The core material shall be 9mm thick MDF Board having bulk density 750kg /m^3 and grade – 1 as per IS 12406/88
   t. The backing material sheet shall be minimum 0.25mm th ick electro galvanized steel 1200 x 2400 mm size
   u. Fixing with necessary clamps
   v. The external size of the board shall be measured and paid for.

CONDITIONS FOR CEMENT.

I. The contactor shall procure 43 grade (conforming to IS 8112) ordinary Portland cement as required in the work, from reputed manufactures of cement, having a production capacity of one million tonnes more per annum, such as ACC, L&T, J.P. Rewa, Vikram, Shree Cement, Birla Jute & Cement corporation of India etc. as approved by Mini stry of Industry, Government of India, and holding licence to use ISI certification mark for their product whose name shall be got approved from Engineer -in-charge. Supply of cement shall be taken in 50kg. bags bearing / manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS Codes. In Case test results indicate that the cement arranged by the contractor does not conform to the re levant BIS codes, the same shall stand rejected and shall be removed from the site by the contactor at his own cost within a week's time of written order from the Engineer-in-charge to do so.

II. The cement shall be got tested by Engineer -in-Charge and shall be used on work only, after satisfactory test results have been received. The contactor shall supply free of charge the cement required for testing. The cost of tests shall be borne by the contactor. Nothing extra shall be payable on this account.

III The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The

theoretical consumption of cement shall be worked about as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein.

(IV) Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

(V) Damaged cement shall be removed from site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not

do so within three days of the receipt of notice, the Engineer-in-charge shall got it removed at the cost of the contractor.

CONDITIONS FOR STEEL

(i) The contactor shall procure steel reinforcement bars conforming to relevant BIS codes from main producers as approved by ministry of steel and secondary producers or re-rollers having valid B.I.S. licence. For TMT bars conforming to relevant BIS code, procurement shall be made from main producers and secondary producers having valid BIS licence. The

contractor shall have to obtain and furnish test certificates to the Engineer -in-Charge in respect of all suppliers of steel brought by him to the site of worked samples shall also be taken and got tested by the Engineer -in-charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to BIS code, the same shall stand rejected and shall be removed from the site of work by the contactor at hi s cost within orders from the Engineer-in-charge to do so.

(ii) The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this accounts. Bars of differ ent sizes and lengths shall be stored separately to facilitate easy counting and checking.

iii) The contractor shall supply free of charge the steel required for testing. The cost of tests shall be borne by the contactor. Nothing shall be payable on this account.

(iv) The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by condition laid therein.

(v) Steel brought to site and steel remaining unused shall not removed from site without the written permission the Engineer -in-charge.

LIST OF APPROVED VENDORS

SL NO	ITEMS	NAME OF VENDORS
1	Flush door shutters	Jwala,Duro,National
2	Paints	Berger,Asian,Nerolac
3	Steel for Reinforcement	Tata,Sail,Rathi, Kamdhenu
4	Structural Steel	Tata,Sail,Rana, Capital, k.L.,IISCO
5	Ceramic Tiles	Kajaria,Orient,Somani
6	China Ware	Hind Ware, Parry Ware, Cera, Neycer.
7	Pneumatic Cistern	Commander,Hind Ware
8	G.I.Pipes	Tata , Jindal
9	S.W.Pipes	Perfect
10	C.I.Pipes	Rif , Neeco, Hepco
11	Green Board	Golden Display Systems, White mark, Surbhi Marketing Pvt. Ltd.
12	Vitriefied Tiles	Euro,Naveen,Kajaria, Durato
13	Interlocking Paver Blocks	Nitco, K.K. HINDUSTAN
14	FRP DOORS	Fibre Ways Technology, Ashu Model Arts.
15	PVC Tanks	Sintex, Surya
16	Composit Pipe	Jindal
17	Factory Made steel window	Gurjeet, SKS, Metal Windows.

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF STONE WORK/TILE WORK.

The agreement made this…….…… day of …….. Two Thousand …… between ……S/o …… (hereinafter called the guarantor of the one part) and the managing director , DSIIDC (hereinafter called the Government / Department of the other part).

Whereas as this agreement is supplementary to a contract (hereinafter called the contract) dated …….. And made between the Guarantor of the one part and the Government of the other part, whereby the contractor, inter alia undertook to render the work in the said contract recited structurally stable workmanship, finishing and use of sound material .

And Whereas the guarantor agreed to give a guarantee to the affect the said structure will remain structurally stable and guaranteed against faulty workmanship , finishing and material.

Now the Guarantor hereby guarantees that work executed by him will remain structurally stable after expiry of maintenance period prescribed in the contract for the minimum of period 5 years to be reckoned form the date after expiry of maintenance period prescribed in the contract .

The decision of the Engineer-in-charge with regard to cause of defect shall be final during this period of guarantee the guarantor shall make good all defects to the

satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the department by some other agency at the Guarantor's cost and risk. The decision of the Engineer-in-charge as to the cost payable by the guarantor shall be final and binding.

That if the Guarantor fail to make all defects, commits, breach there under, then the Guarantor will indemnify the principal and his successors against all loss, damages, cost, expensed or otherwise which may be incurred by him by reason of any default on the part of the Guarantor in performance and observance of this supplementary agreement . As to the amount of loss and /or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on the parties.

In witness whereof these presents have been executed by the obligator …… and by ……. And for and behalf of the Managing Director, DSIIDC on the day, month and year first above written.

Signed sealed and delivered by Obligator in the presence of :

1. 2.

SIGNED FOR AND ON BEHALF OF MANAGING DIRECTOR, DSIIDC

1. 2.

Guarantee to be executed by the contractor for removal of defects after completion in respect of sanitary installation/water supply work.

The agreement made this ……day of …….. two thousand ……. …….. between……..…… S/o……. (Hereinafter called the guarantor of the one part) and the managing director DSIIDC, (hereinafter called the Government / Department of the other part).

Whereas as this agreement is supplementary to a contract (hereinafter called the contract) dated …….. and made between the Guarantor of the one part and the Government of the other part, whereby the contractor, inter alia undertook to render the work in the said contract recited structural ly stable, leak proof and sound material workmanship, anodizing, colouring, sealing.

Now the gurantor hereby guarantees that work executed by him will free form any leakage, seepage, cracks, in pipes and guaranteed against faulty material and workmanship, defective galvanizing for tow years form the date of issue of completion certificate.

The decision of the Engineer-in-charge with regard to nature of defect shall be final.

During this period if any defect is found the guarantor will rectify and shall made good all defects to the satisfaction of the Engineeer-in-charge his cost and shall comments the work for such rectification within seven days from the date of issue of the notice from the Engineer –in-charge calling upon him to rectify the defect falling which the work shall be got done by the department by some

other contractor at the Guarantor's cost and risk. The decision of the Engineer - in-charge as to the cost payable by the Guarantor shall be final and binding .

That if the Guarantor fails to make good all defects or commits breach there under then the guarantor will in indemnify the principal and his successors against or loss damages cost expenses or otherwise which may be incurred by him by reason of any default on the part of Guarantor in performance and observance on this supplementary agreement . As to the amount of loss and/ or damage and /or cost incurred by the Government, the decision of the of the Addl. Director-in-charge will be final and binding on the parties.

In witness whereof these presents have been executed by the obligator …….and by …….. and for and behalf of the Managing Director, DSIIDC on the day, month and year first above written.

Signed Sealed and delivered by Obligator in the presence of:

2.

Signed for and on behalf of Managing Director, DSIIDC

1. 2.

PERFORMANCE BANK GUARANTEE

To …… (Name of the employer) ……(Address of Employer) …….

Whereas …….. (name of address of the contractor (hereinafter called “the Contractor”) has undertaken, in pursuance of contract No. ……date ……to execute …… (name of the contract and brief description of works) hereinafter called “the contract”)

And whereas we have been stipulated by you in the said contract that the contractor shall furnish you with a bank guarantee by a derecognized bank for the sum specified therein as security for compliance with his obligations in a ccordance with the contract.

And whereas we have agreed to give the contractor such a bank guarantee:

Now therefore, we hereby affirm that we are guarantor and responsible to you, on behalf of the contractor, up to a total of …….(amount of guarantee)……. (in words), such sum being payable in the types and proportions of currencies in which the contact price is payable, and we undertake to pay you upon your first written demand and without cavil or argument, any sum or sums within the limit of …… (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive off the necessity of your demanding the said debt from the contractor before presenting us with the demand.

We further agree that no change or addition or other modification of the terms of the contract or of the works to be performed thereunder or any of the contract documents which may be made between you and contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of issue of the defects correction certificate.

Signature and seal of the guarantor …….
Name of the Bank ……
Address ……..
Date …….

GUARANTEE BOND

GUARANTEE TO BE EXECUTED BY CONTRACTORS FOR REMOVAL OF DEFECT AFTER COMPLETION IN RESPECT OF WATER PROOFING.

The Agreement made this…….…… day of …….. Two Thousand …… between ……S/o …… (hereinafter called the guarantor of the one part) and the Managing Director, DSIIDC (hereinafter called the Government / Department of the other part).

WHEREAS AS THIS agreement is supplementary to a contract (hereinafter called the contract) dated …….. and made between the Guarantor of the one part and the Government of the other part, whereby the contractor, inter alia undertook to render the building and structures in said contract recited completely water and leak proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect the said structures will remain water and leak proof, for five years from the date of completion of maintenance period.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be five years to be reckoned from the date after the maintenance period prescribed in the contract.

Provided that the Guarantor will not be responsible for leakage caused by earthquake o r misuse of roof or alteration and for such purpose.

a) Misuse of roof shall mean any operations, which will damages proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof.

b) Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts.

c) The decision of the Engineer-in-charge with regard to cause of leakage shall be final.

During this period of guarantee, the guarantor shall make good all defects in case of any defect being found, render the building water proof to the satisfaction of the Engineer-in-charge at his cost and shall commence the work for such rectification within seven days form the date of issue of notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-charge as to the cost payable by the guarantor shall be final and binding.

That if the Guarantor fails to execute the water proofing or commits breach there under, then the Guarantor will indemnify the Principal and his successors against all loss, damages, cost, expenses or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement . As to the amount of loss and /or cost incurred by the Govern ment. The decision of the Engineer-in-charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator …… and by ……. an for and behalf of the Managing Director, DSIIDC on the day, month and y ear first above written.

Signed sealed and delivered by Obligator in the presence of :

1. 2.

SIGNED FOR AND ON BEHALF OF MANAGING DIRECTOR, DSIIDC

1. 2.

Additional Specification & Conditions

1. The work shall be carried out strictly in accordance with CPWD specifications for Electrical Works 2005 (Internal) and 1995 Part-II (External) as amended up to date and in accordance with Indian Electricity Rules, 1956 Indian Electricity Act, 2003 as amended up to date and as per instructions of the Engineer-in-Charge including as below and nothing will be paid extra.

2. The electrical work shall be carried out as per actual requirement of individual school and quantity is given in the schedule of work may vary of either side and it is also possible that some of the items given in the schedule of work may not be required to be executed in/ some of the schools. The decision of Engineer-in-Charge of the work, in this regard, shall be final and binding on the tenderer. However tenderers are required to quote their rates for all the items given in the schedule of works attached. Bifurcations of quantity of items, school wise for 32 Nos. of Govt. Schools are also attached for reference and deviation of items, if any shall be worked out in accordance with.

3. All materials to be used on this work should brought in advance by the contractor to facilitate testing before use and shall be got approved from the Engineer-in-Charge before installation at site.

4. The work shall be carried out according to approved drawing/details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer-in-Charge who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout.

5. All damages done to the building during execution of Electrical work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer-in-Charge. Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer-in-Charge about recovery shall be final.

6. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the Engineer-in-Charge. The program of electrical works are to be co-ordinate in accordance with the building work and no claim for idle labour will stipulated in the tender, electrical work shall have to be completed along with completion of civil work.

7. All the debris of the electrical works should be removed and the contractor should clear the site immediately after the accruing of debris. Similarly, the contractor should immediately clear off any rejected material from the site.

8. Issue of material to the contractor wherever stipulated, shall be in accordance with to the requirement at site from time to time depending upon the progress of work.

9. Cement for this bonafied work is to be arranged and used by the contractor him self and nothing extra will be paid on this account.

10. The contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.

11. The size of conduit and wires shall be got approved from the Engineer-in-Charge before taking up the execution.

12. The contractor shall make his own arrangement at his own cost of electrical general tools and plants required for the work.

13. Main Board and Main Distribution Board: The work shall be carried out according to the drawings/details as approved by the Engineer-in-Charge. The contractor shall have to get the samples approved before the whole lot is brought to site and it shall include all inter connections etc.

14. No Central / State Sales Tax/ Contract Tax/ Excise Duty etc. shall be separately paid by the department. The tendered rates should be inclusive, all taxes and duties. Deduction of Contract tax at source shall be made while releasing payment through running/final bills at the rate as applicable. A certificate specifying the rate and amount of deduction shall however be issued.

15. The entire installation shall be at the risk and responsibility of the contractor until these are tested and hand over to the department.

16. Not withstanding the schedule of quantities, all items of interrelated works considered necessary to make the installation complete and operative are deemed to be included shall be provided by the contractor at no extra cost.

17. The connection, inter connection, earthing and inter earthing shall be done by the contractor wherever required and nothing extra shall be paid on this account.

18. Some of the items of work, if already executed in that case the successful tenderer shall have to use these items for completing the work. For wiring, the existing conduit wherever required shall be used by the contractor. The recovery will be made for these items as accepted rate of other agencies.

19. Nothing extra shall be paid for:- Inter connections with thimbles/wires/tapes/ strips etc.

20. Watch and ward of the material shall be the responsibility of the Contractor till they are handed over to the department for which nothing extra shall be paid.

21. The contractor shall bear all the expenses for the testing of the electrical material/switch gears etc. from the designated lab, as desired by Engineer-in-Charge.

22. The contractor shall abide the specification given in the tender where the specification are not given CPWD specification with as on date amendments shall be followed items where CPWD specification are not covered, the decision of Engineer-in-Charge shall be final and binding.

23. The contractor shall also assess the quantities of various items involved in the work and shall procure the material accordingly. If excess material is procured it shall be the responsibility of the contractor.

24. In case any extra quantity gets procured in running bills i.e. more than to be used, it shall be taken back and amount shall be adjusted.

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORK

1. All hardware items such as screws, thimbles, G.I. wires etc, which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned.

2. All hardware materials such as nuts/I-bolts/screws/washers etc. to be used in the work shall be zinc/cadmium-plated iron.

3. Any conduit, which is not to be wired by the contractor, shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.

4. While laying conduit, suitable junction boxes shall be left for pulling the wires.

5. M.S CONDUIT, Insulated copper conductor wire used on the work shall be FR grade for which nothing extra shall be paid.

6. Material to be used in the work shall be ISI marked. The makes of material have been indicated in the list of acceptable makes. No other make will be acceptable. However Engineer-in-Charge can ask to use any specific make among the acceptable makes. If in case non of acceptable make of material is available in the market then make shall be decided by the Engineer-in-Charge. The material to be used in the work shall be got approved from the Engineer-in-Charge before its use at site. The Engineer-in-Charge shall reserve the right to instruct the contractor to remove the material, which in his opinion, is not as per specifications.

7. While deciding the size of switch boxes for light point/fan point/ exhaust fan point items wherever fan regulators are to be provided extra two modules will be provided for fan regulator (fan regulator is to be provided in separate item).

8. Where Modular type switches/sockets/telephone outlets are to be provided the same shall be of only one make.

9. The MCB Distribution board shall be factory fabricated in the wor ks of the manufacturer of the MCBs of any of the makes specified and the same shall be duly pre-wired in the works. The board shall be brought to site in ready for installation condition. The MCBs and the MCB Distribution Board shall be of the same make and shall be of double door type.

10. The earthing shall be carried out in the presence of the Engineer-in-Charge or his authorized representative.
11. All fittings/fans will be earthed with 1.5 sq. mm dia insulated (green colour) copper wire.
12. After completion of the installation, testing shall be carried out as provided in CPWD specifications. The contractor will have to furnish completion plans and completion certificate as per specifications.
13. If any statutory approval of the work is required from any other Gov t. agency it shall be the responsibility of contractor to get these approvals from the concerned departments at his own cost. The department on production of deposition receipt shall reimburse however fees deposited by the contractor for the approval.

14. All the MCB shall have 10 KA rating.

TECHNICAL SPECIFICATIONS

I. INTERNAL WIRING

1. SYSTEM OF WIRING

The system of wiring shall consist of single-core/multi-core PVC insulated Copper conductor multistrand wires in MS conduits concealed/exposed as call ed for.

2. GENERAL

Prior to laying and fixing of conduits, the Contractor shall carefully examine the drawings indicating the layout of conduits, satisfy himself about the sufficiency of number and size of conduits, location of junction boxes, sizes and location of switch boxes and other relevant details. Any modifications suggested by the Contractor shall be got approved from the Consultants before the actual laying of conduit is commenced. Any discrepancy found in the drawings shall be brought to the notice of the Consultants promptly.

3. MATERIAL

Steel Conduits :

(i) All rigid conduit pipes shall be of steel and be ISI marked. The wall thickness Shall be not less than 1.6mm (16SWG) for conduits upto 32 mm dia and not less Than 2mm (14 SWG) fro conduits above 32 mm dia. These shall be solid drawn Or reamed by welding, and finished with galvanized or stove enameled surface.

(ii) The maximum number of PVC insulated cables conforming to IS: 694 -1990 That can be drawn in one conduit is given size wise in Table I, and the number of cables per conduit shall not be exceeded. Conduit sizes shall be selected accordingly in each run.

(iii) No steel conduit less than 20mm in diameter shall be used.

3.1 Conduit Accessories

(i) The conduit wiring system shall be complete in all respects, including their accessories.

(ii) All conduit accessories shall be of threaded type, and under no circumstances pin grip type or clamp grip type accessories shall be used.

(iii) Bends, couplers etc. shall be solid type in recessed type of works and may be solid or inspection type as required, in surface type of works.

(iv) (a) Saddles for surface conduit work on wall shall not be less than 0.55mm (24 gauges) for conduits upto 25 mm dia and not less than 0.9mm (20 gauges) for larger diameter. The corresponding widths shall be 19 mm & 25 mm.

(v) (b) The minimum width and the thickness of girder clips used for fixing conduits to steel joists, and clamps shall be as per Table II.

3.3 Outlets

(i) The switch box or regulator box shall be made of metal on all sides, except on the front, In the case of cast boxes, the wall thickness shall be at least 3mm and in case of welded mild steel sheet boxes, the wall thickness shall not be less than 1.2mm (18 gauge) for boxes upto a size of 20 cm x 30 cm , and above this size 1.6mm (16 gauge) thick MS boxes shall be used. The metallic boxes shall be duly painted with anticorrosive paint before erection as per chapter 15 of these Specifications.

(ii) (a) Outlet boxes shall be of one of the size, covered in the S chedule of Rates (Elect.), Part-I Internal-1994/2004.

(iii) An earth terminal with stud and 2 metal washers and terminal block shall be provided in each MS box for termination of protective conductors and for connection to socket outlet/metallic body of fan reg ulator etc.

(iv) A metal strip shall be welded/screwed, to the metal box as support if tumbler type of control switches, sockets and/or fan regulators in flush pattern.

(v) Clear depth of the box shall not be less than 60mm and this shall be increased suitably to accommodate mounting of fan regulators in flush pattern.

(vi) The fan regulators can also be mounted on the switch box covers, if so stipulated in the tender specifications, or if so directed by the Engineer -in-Charge.

(vii) Except where otherwise stated, 3mm thick p henolic laminated sheets as per clause 3.14.c.shall be fixed on the front with brass screws, or aluminium ally/cadmium plated iron screws as approved by the Engineer -in-Charge.

4. INSTALLATION

4.1 Common aspects for recessed and surface conduit works.

Conduit joints

(a) The conduit work of each circuit or section shall be completed before the cables are drawn in.

(b) Conduit pipes shall be joined by means of screwed couplers and screwed accessories only. Threads on conduit pipes in all cases shall be between 13 mm to 19mm long, sufficient to accommodate pipes to full threaded portion of couplers or accessories.

(c) Cut ends of conduit pipes shall have no sharp edges, nor any burrs left to avoid damage to the insulation of the conductors while pulling them through such pipes.

(d) The Engineer-in-Charges, with a view to ensuring that the above provision has been carried out, may require that the separate lengths of conduit etc., after they have been prepared, shall be submitted for inspection before being fixed.

(e) No bare threaded portion of conduit pipe shall be allowed, unless such bare threaded portion is treated with anticorrosive preservative or covered with approved plastic compound.

Bends in conduit

(a) All necessary bends in the system, including diversion, shall be done either by neatly bending the pipes without cracking with a bending radious of not less than 7.5 cm, or alternativerly, by inserting suitable solid or inspection type normal bends, elbows or similar fittings, or by fixing cast iron inspection boxes, whichever is mo st suitable.

(b) No length of conduit shall have more than the equivalent of four quarter bends form outlet to outlet.

(c) Conduit fittings shall be avoided as far as possible on conduit system exposed to weather. Where necessary, solid type fitt ings shall be used.

Outlets

(a) All outlets such as switches, wall sockets etc. may be either flush mounting type, or of surface mounting type, as specified in the Additional Specifications.

(b) All switches(except piano type switches), socket outlets and fan regulators shall fixed on metal strips which shall be screwed/welded to the box, piano type switches and accessories shall be fixed on the phenolic laminated sheet covers in flush pattern.

Painting after erection

After installation, all accessible surface s of conduit pipes, fittings, switch and regulator boxes etc. shall be painted in compliance with the clauses under Chapter 15-"Painting".

4.2 Additional requirements for surface conduit work.

(i) Painting before erection.

The outer surface of conduit including al l bends, unions, tees, junction boxes etc. forming part of the conduit system, shall be adequately protected against rust when such system is exposed to weather, by being painted with 2 coats of red oxide paint applied before they are fixed.

(ii) Fixing conduit on surface.

Conduit pipes shall be fixed by saddles, secured to suitable approved plugs with screws in an approved manner at an interval of not more than one meter, but on either side of the couplers or bends or similar fittings, saddles shall be fixed a t a distance of 30 cm from the center of such fittings.

(a) Where conduit pipes are to be laid along the trusses, steel joists etc. the same shall be secured by means of saddles or girder clips or clamps as required by the engineer-in-charge.

(b) In long distance straight run of conduit, inspection type couplers at reasonable intervals shall be provided, or running threads with couplers and jam nuts shall be provided.

(d) Fixing outlet boxes.

Only portion of the switch box shall be sunk in the wall, the other portion being projected out for suitable entry of conduit pipes into the box.

4.3 Additional requirements for recessed conduit work

(i) Making chase

(a) The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired.

(b) In the case of buildings under construction, the conduits shall be buried in the wall before plastering, and shall be finished neatly after erection of conduit.

(c) In case of exposed brick/rubber masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work.

(ii) Fixing conduits in chase

(a) The conduit pipe shall be fixed by means of staples, J-hooks, or by means of saddles, not more than 60 cm apart or by any other approved means of fixing.

(b) All threaded joints of conduit pipes shall be treated with some approved reservative compound to secure protection against rust.

(iii) Fixing conduits in RCC work

(a) The conduit pipes shall be laid in position and fixed to the steel reinforcement bars by steel binding wires before the concreting is done. The conduit pipes shall be fixed firmly to the steel reinforcement bars to avoid their dislocation during pouring of cement concrete and subsequent tamping of the same.

(b) Fixing of standard bends or elbows shall be avoided as far as practicable, and all curves shall be maintained by bending the conduit pipe itself with a long radius, which will permit easy drawing in of conductors.

(c) Location of inspection/ junction boxes in RCC work should be identified by suitable means to avoid unnecessary chipping of the RCC subsequently to locate these boxes.

(iv) Fixing inspection boxes

(a) Suitable inspection boxes to the minimum requirement shall be provided to permit inspection and to facilitate replacement of wires, if necessary.

(b) These shall be mounted flush with the wall or ceiling concrete. Minimum 65 mm depth junction boxes shall be used in roof slabs and the depth of the boxes inl other places shall be as per IS: 2667-1988.

(c) Suitable ventilating holes shall be provided in the inspection box covers .

(v) **Fixing switch boxes and accessories**.

Switch boxes shall be mounted flush with the wall. All outlets such as switches, socket outlets etc. shall be flush mounting type, unless other wise specified in the Additional specifications.

(vi) Fish wire

To facilitate subsequent drawing of wires in the conduit, GI fish wire of 1.6 mm/1.2mm (16/18 SWG) shall be provided along with the laying of the recessed conduit.

(vii) Bunching of Cables

(a) Cables carrying Direct Current may, if desired, be bunched whatever their polarity, but cables carrying alternating current, if installed in metal conduit shall always be bunched so that the outgoing and return cables are drawn into the same conduit.

(b) Where the distribution is for single phase loads only, conductors for these phases shall be drawn in one conduit.

(c) In case of three phase loads, separate conduits shall be run from the distribution boards to the load points, or outlets as the case may be.

4.4 Earthing requirements

(i) The entire system of metallic conduit work, including the outlet boxes and other metallic accessories, shall be mechanically and electrically continuous by proper screwed joints, or by double check nuts at terminations. The conduit shall be continuous when passing through walls or floors.

(ii) A protective (loop earthing) conductor (s) shall be laid indide the conduit between the metallic switch boxes and distribution switch boards and terminated into proper earth lugs/ terminals. Only PVC insulated copper conductor cable of specified size, green-yellow In color shall be allowed. Such conductors will not run external to the conduits.

(iii) The protective conductors shall be terminated properly using earth studs, earth terminal block etc. as the case may be.

(iv) Gas or water pipe shall not be used as protective conductor (earth medium).

TABLE I

Maximum number PVC insulated 650/1100 V grade aluminum/copper Conductor cable conforming to IS: 694-1990.

[Clause 4.2.1 (ii)]

Nominal cross sectional area of conductor in sq. mm	20 mm		25 mm		32 mm		38mm		51 mm		64 mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1	2	3	4	5	6	7	8	9	10	11	12	13
1.50	5	4	10	8	18	12	--	--	--	--	--	--
2.50	5	3	8	6	12	10	--	--	--	--	--	--
4	3	2	6	5	10	8	--	--	--	--	--	--
6	2	--	5	4	8	7	--	--	--	--	--	--
10	2	--	4	3	6	5	8	6	--	--	--	--
16	--	--	2	2	3	3	6	5	10	7	12	8
25	--	--	--	--	3	2	5	3	8	6	9	7
35	--	--	--	--	--	--	3	2	6	5	8	6
50	--	--	--	--	--	--	--	--	5	3	6	5
70	--	--	--	--	--	--	--	--	4	3	5	4

Note:

1) The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.

2) The columns headed 'S' apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight by an angle of more than 15 degrees. The columns headed 'B' apply to runs of conduit, which deflect from the straight by an angle of more than 15 degrees.

3) Conduit sizes are the nominal external diameters.

5. DATA / VOICE

Conduits, junction boxes, draw boxes, outlet boxes and covers for Data/Voice system shall be as described under relevant clauses of the specifications. Conduits for Data/Voice system shall be atleast 300 mm away from the electrical conduits. The conduits for Data/Voice wiring shall be of specified size and shall terminate at outlets, as indicated on the drawings.

6. BUNCHING OF WIRES

Wires carrying current shall be so bunched in the conduit that the outgoing and return cables are drawn into the same conduit. Cables originating from two different phases shall not be run in the same conduit.

7. CONDUCTOR

All PVC insulated **Copper** conductor wires shall be ISI marked.

8. DRAWING CONDUCTORS

The drawing and jointing of **copper** conductor wires and cables shall be executed with due regard to the following precautions. While drawing insulated wires into the conduit, care shall be taken to avoid scratches and kinks which cause breaka ge of conductor. There shall be no sharp bends. Insulation shall be shaved off like sharpening of a pencil, and it shall not be removed by cutting it across the wiring. Strands of wire shall not be cut for connecting at terminations. The terminals shall have sufficient cross sectional area for all strands and shall have flat ends. All looped joints shall be soldered and connected through terminal block/ connector. The pressure applied to tighten terminal screws shall be just adequate (neither too much nor too less).

All wires and cables shall bear the manufacturer's label and shall be brought to site in new and original packages.

PVC insulated wires of 650/1100 Volts grade shall be used for all internal wiring works. The sub-circuit wiring for points shall be carried out in looping system and no joints shall be allowed in the length of the conductors. No wire shall be drawn into any conduit, until all works, that may cause injury to the wires is completed. Care shall be taken in pulling the wires s o that the insulation is not damaged. Before the wires are drawn into the conduit, the conduits shall be thoroughly cleaned of moisture, dust, dirt, or any other obstruction by forcing compressed air through the conduits. The pulling of wires shall be do ne by mechanical equipment i.e. being manufactured by Asian Construction Ltd.

9. JOINTS

All joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switch boxes only. Jointing of cables shall be made in conduits a nd junctions boxes. Conductors shall be continuous from outlet to outlet.

10. MAINS AND SUB-MAINS

Mains and sub-main wires, where called for, shall be of the rated capacity and approved make. Every main and sub-main shall be drawn into an independent a dequately sized conduit. Adequate no. of draw boxes shall be provided at convenient locations to facilitate easy drawing of the sub-mains and main cables. An independent earth wire of proper rating shall be provided for every single phase sub-main. The earth wires shall be fixed to conduits by means of suitable **copper** clips at not more than 1000 mm distance. Where mains and sub -main cables are connected to the switchgear, sufficient extra lengths of such cables shall be provided at terminal ends to faci litate sub-sequent connections, maintenance and repairs.

11. LOAD BALANCING

Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

12. COLOUR CODE OF CONDU CTORS

Colour code shall be maintained for the entire wiring installation : Red, Yellow, Blue for three phases, Black for neutral and green for earth.

13. MODE OF MEASUREMENT OF POINT WIRING

13.1 In the case of points with more than one light point controlled by the same swit ch, such point shall be measured in two parts i.e. from the switch to the first point called as light point. First point to second point, second point to third point etc are called as loop point. No circuit wiring shall be paid extra i.e. the point wiring shall include the wiring of light/fan/outlet of any length from the distribution board via switch to the point. Measurements shall be in numbers.

13.2 The supply of following shall be deemed to be included as part of the point wiring rate : - light wires, conduits with all accessories, junction and inspection boxes, light control switch boxes with switch & receptacles.

13.3 Wiring shall be carried out as per I.S./IEC/CPWD and local bodies regulations.

13.4 Earthing wire of 1.5 sq. mm. PVC insulated copper c onductor is also included in the point wiring rate and nothing extra shall be paid for it.

13.5 The point wiring rate shall also include the rate of 1 mtr of 20 mm dia G.I. flexible conduit including checkout on both sides and required wiring from the junc tion box to the fixture.

13.6 With regard to 5 amp outlets, all the outlets which are being fed from lighting DB and connected in lighting circuit shall be measured in numbers and rate shall include wires, conduits with all accessories junction and inspect ion boxes, socket outlet, switch and earthing wires.

II. SWITCHES, RECEPTACLES & FIXTURES

1. SWITCHES

This section covers supply, installation, testing and commissioning of all switches, socket, receptacles, lighting fixture etc.

All 5/15 amp switches shall be enclosed type and flush mounted type of 250 V AC grade. All switches shall be fixed inside the switch boxes on adjustable MS strips/plates with tapped holes and brass machine screws, leaving ample space at the back and sides for accommodating wires. The switch controlling the light shall be located at 1000 mm. above finished floor level, unless otherwise indicated in the drawing.

2. FLUSH PLATES

All switch receptacles and telephone system outlets in walls shall be provided with approved **White Polycarbonate modular cover plate,** secured to the box with countersunk brass screws. Where two or more switches are installed together, they shall have gang plates, unless otherwise called for.

3. WALL SOCKET OUTLETS

All 5 amp wall socket outlets where called for on the drawings shall be combined type with 5 pins. All 15 amp wall socket outlets where called for shall be combined and 6 pin type. The sockets shall be erected approximately 150 mm above floor level, unless otherwise specified in the drawing.

The switch controlling the point outlets and socket outlets shall be on the phase wire of the circuit. The earth terminal of the socket shall be connected to the earth terminal provided inside the box by means of insulated copper conductor wire.

4. LIGHTING FIXTURES

The light fixtures shall be assembled and installed in position complete and ready for service in accordance with the detailed drawings, manufacturer's instructions and to the satisfaction of the **ENGINEER.** Fixtures shall be suspended true to alignment plumb level and capable of resisting all lateral and vertical forces and shall be fixed as required.

It is the duty of the Contractor to make these provisions at the appropriate stage of construction. All switch and outlet boxes and light fittings shall be bonded to earth through connector blocks. Wires brought out from junction boxes shall be encased in PVC flexible pipes for connecting to fixture concealed in suspended ceiling.

III. DISTRIBUTION BOARDS

This section covers supply, installation, testing and commissioning of Distribution Boards.

1. MCB DISTRIBUTION BOARDS (Sub Distribution boards)

1.2 Distribution Boards shall be suitable for operation on 3 phase/single phase 415/230 Volts, 50 Hz neutral grounded at Transformer.

1.3 The Distribution Boards shall comply with the relevant Indian Standards and Indian Electricity Rules and Regulations.

2. CONSTRUCTION FEATURES

2.1 The Distribution Boards shall be metal enclosed, CRCA sheet steel cubical, indoor, dead front, wall mounting type. The Distribution board shall be totally enclosed, completely dust and vermin proof. Gaskets between all adjacent units and beneath all covers shall be used to render the joints dust proof. Doors and covers shall be fully gasketed with foam rubber and/or rubber strips and shall be lockable. Sheet steel used in the construction of Distribution Boards shall be 16 guage CRCA sheets and shall be folded and braced as necessary to provide a rigid support for all components. Joints of any kind in sheet metal shall be seam welded, all welding slag grounded off and welding pits wiped smooth with plumber metal.

2.2 The distribution boards shall be mounted at height of 1200 mm from floor to bottom of panel unless otherwise specified. All the panels and covers shall be properly fitted square with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with hank nuts. Self threading screws shall not be used in the construction of Distribution boards.

2.3 Knockout holes of appropriate size and number shall be provided at top and bottom to drill holes for cables entry as required, as per site conditions.

2.4 Removable sheet steel gland plates shall be provided at top and bottom to drill holes for cables entry as required, as per site conditions.

2.5 The distribution boards shall be installed by the contractor in recess or surface on walls by fastening to suitably grouted studs of not less than 12 mm diameter.

2.6 The distribution boards shall be provided with 3 pole neutral miniature circuit breaker with neutral link (TPN MCB) or double pole miniatere circuit breakers (DP MCB) of appropriate

capacity as incoming as per the Schedule of Quantities. The distribution boards shall be provided with 3 numbers double pole earth leakage circuit breakers (DP ELCB) or four pole residual current circuit breaker on the incomer as per Schedule of Quantity. The distribution board shall be provided with single pole miniature circuit breakers (SP MCB) or TP MCB as outgoing, as per Schedule of Quantity.

2.7 MCB's shall be provided on the phases of each circuit. The individual banks of MCB's shall be detachable. There shall be ample space behind the banks of MCB's to accommodate all the wiring. All the distribution boards shall be completely factory wired, ready for connections. All the terminals shall have adequate current rating and size to suit individual feeder requirements. Each circuit shall be clearly numbered from left to right to corresp ond with wiring diagram. All the switches and circuits shall be distinctly marked with a small description of the service installed.

3. MINIATURE CIRCUIT BREAKERS

3.1 Minature circuit breakers shall be quick make and break type, and shall conform to relev ant Indian Standards. The housing shall be heat resistant and having a high impact strength. The fault current withstand capability of the MCB's shall not be less than 9000 amps at 230 Volts. MCB's shall be flush mounted and shall be provided with trip free manual operating lever 'ON' and 'OFF' indications. The contacts shall be provided to quench the arc immediately. MCB shall be provided with magnetic thermal releases for over current and short circuit protection. The overload or short circuit devic e shall have a common trip bar in the case of DP and TPN miniature circuit breakers. The contact closing shall be independent of operator speed. The terminal shall be protected against any finger contact to IP 20 degree of protection with no restriction for line & load.

4. EARTH LEAKAGE CIRCUIT BREAKERS

4.1 All live parts of earth leakage breakers shall be totally enclosed in an insulated heat resistant housing. The operating mechanism shall be quick make and break, trip free and shall be able to isolate automatically the electrical circuit under sustained earth fault. The rated sensitivity shall be 100 mA, with a maximum permissible earth fault loop impedance of 1650 Ohms.

5. DRAWING AND DATA

5.1 The following minimum information shall be furnished with the Shop Drawings :-

(a) Overall dimensions showing front view, plan, elevation and cross section.
(b) Complete bill of material module wise.
(c). Complete one line diagram.

6. INSTRUCTION MANUALS

6.1 Contractor shall furnish 6 copies of instruction manua l which shall contain detailed instruction for installation, testing, commissioning, operation and maintenance requirements.

7. TESTING AND COMMISSIONING

Commissioning checks and tests shall include all wiring checks and checking up of connections.

a. Operation checks and lubrication of all moving parts.
b. Continuity checks of wiring, fuses etc. as required.
c. Insulation test : When measured with 500 V meggar, the insulation resistance shall not be less than 100 mega ohms.

8. TEST WITNESS

8.1 Tests shall be performed in the presence of the ENGINEER. The Contractor shall give at least fifteen (15) days advance notice of the date when the tests are proposed to be carried out.

IV. 415 V. (SWITCHGEAR) MAIN BOARD (L.T. PANEL)

1. SCOPE

This section covers the detailed requirements for design, supply, installation, testing and commissioning of medium voltage panel for 415 Volts, 3 phase, 50 HZ 4 wire system, in line with schematic diagram and as specified.

2. TYPE OF PANEL

The L.T. Panel shall comprise of the following type of switchgears as specified. The panel shall be capable of fault withstand capacity of 50 KA for duration of one second.

2.1 Air circuit breakers of withdrawal type (as specified).
2.2 Moulded Case Circuit Breakers.

2.3 The Panel shall be metal enclosed, indoor type, floor mounting free standing and cubical type having sectionalisation and outgoing switchgears as specified. The design shall be cubicle type. The degree of enclosure protection shall be IP 42 as per IS : 2147 (amended to d ate).

3. GENERAL CONSTRUCTION

3.1 The Panel shall be floor mounting, free standing, totally enclosed and extensible type. The switch board shall be dust & vermin proof with lockable arrangement and degree of protection as IP 42 (as per IS:2147), suitable for the specified climate conditions. The design shall include all provisions for safety of operating and maintenance personnel. The general construction shall conform to IS:8623 for factory assembled switch board (amended to date).

3.2 Each vertical section shall be equipped with space heater and thermostat. Each shipping section shall have metal sheets at both ends.

4. CUBICLE TYPE PANEL

4.1 Cubicle type Panel shall be fabricated out of CRCA sheet steel 2.0 mm thick. Wherever necessary, such sheet steel member shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalisation and segregation for each circuit. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type board shall have hinged access doors at the rear. **Overall height of the board shall not exceed 2.3 meters.** Operating levers, handle etc. of highest unit shall be at a maximum height of 1.8 m, and that of the lowest unit shall not be less than 300 mm above finished floor level. Multi-tier mounting of feeders is permissible. The general arrangement for multi-tier construction shall be such that the horizontal tiers formed present a pleasing and aesthetic look. The general arrangement shall be got approved before fabrication. Cable entries for various feeders shall be checked from the site before fabrication which shall be through cable alleys located in between two circuit sections of minimum 300 mm width. All cable entries shall be through gland plates. There shall be separate gland plate for each cable entry so that there will not be dislocation of already wired circuits, when new feeders are added. Cable entry plates shall, therefore, be sectionalised. The construction shall include necessary cable supports for clamping the cable in the cable alley, or in rear cable chamber. All cable entries shall be from the top/bottom or rear which, as already mentioned above shall be checked from the site before fabrication of panels. All the front chamber doors shall be of 2 mm thick CRCA sheet with detachable and lockable arrangement provided thereon.

4.2 INSTRUMENTS

All voltmeters and ammeters shall be flush mounting digital type for incoming and of outgoing feeders conforming to class 1.0/1.5 of IS 1248 for accuracy. All voltmeters shall be protected with SPMCB-2A.

All the measuring instruments shall have IP 52 enclosure protection provided with shrouded terminals.

All the ammeters & voltmeters with shrouded terminals shall be suitable for the operational temp of 04 ^{O}C to 50 ^{O}C and shall withstand 1.2 times overloading at all operational stages.

All meters shall be ISI marked.

V.A. burden for ammeters shall be:-

0 - 30 A	-	1 V.A.
30 A and above	-	1.5 V.A.
Accuracy class	-	1.5

4.3 INDICATOR LAMPS (LED TYPE)

ON/OFF phase indicator lamps shall be provided on the incomer of L.T. Panel, which shall be suitable for operation on 230 Volts AC supply. Necessary filter R/Y/B/G/W/A shall be provided depending upon the function. **All lamps shall be protected by proper SPMCB**. Where phase indicator lamps are provided, these shall be associated with necessary ON/OFF toggle switches.

4.4 SMALL WIRING

All wiring for relays / releases, meters, and indications etc. shall be with suitable size of single core, stranded, copper conductor cables (PVC insulated) conforming to IS : 1554 Part I. Wiring shall be suitably protected within the switchboard. Runs of wires shall be neatly bunched and suitably supported, clamped and enclosed in PVC channels inside the panel. Ferrules shall be provided for identification of the individual wires. Where wires are drawn through steel conduits, the works shall conform to IS 732. Identification ferrules shall be used at both ends of the wires.

All control wiring meant for external connections are to be brought out on terminal board. All wiring shall be of minimum 2.5 sq. mm. single core and for C.T. circuits it shall be 2.5 sq. mm single core. Brass/copper thimbles, insulation tape etc. shall be provided at joints and terminations as required.

4.5 BUS BAR & BUS BAR CHAMBERS

4.5.1 BUS BAR AND CONNECTIONS

The bus bar shall be of high conductivity aluminium alloy of E 91 grade (conforming to IS: 5082-1969) and of adequate cross section. The bus bar system may comprise of a system of totally enclosed, main horizontal bus bars run at the top and vertical bus bars serving all modules, in vertical section, in the control panel. In case of rear access, horizontal bus system shall run suitably, either at the top or bottom. All connections to individual circuits from the bus bars shall be with solid connections. All horizontal bus bars, vertical bus bars and connections shall be suitably sleeved with PVC sleeves or suitably insulated in an approved manner. The bus bar temperature should not exceed 90 ^{O}C i.e. 45^{O}C temperature rise over 45 ^{O}C ambient. The calculation for temperature rise and bus bar sizing should be furnished along with shop drawings for approval. The cross sectional area of bus strips shall thus be derived after deriving the deration factors.

4.5.2 BUS BAR SUPPORTS AND ATTACHMENTS

4.5.2.1 Supports

Bus bar shall be firmly fixed on supports constructed from SMC (glass fiber reinforced thermosetting plastic). The supports shall be sufficiently robust to effectively withstand electro-mechanical stresses produced in the event of short circuit.

4.5.2.2 Connections to Bus Bars

Connections to bus bars ratings of more than 200 amp shall be made with clamping arrangement with bolts and nuts and for bus bars of smaller ratings, use of holes drilled into the bus bars may be made. The neutral strips shall be of same size as phase bars upto 200 amps.

The bolts and nuts used for connections to bus bars shall be of copper alloy, tinned forged brass or galvanized iron. Suitable precaution shall be taken against heating due to bi-metallic contact.

Further for tapping off connections from bus bars, PVC insulated wire may be used for current capacities upto 100 amps and for higher current capacities solid conductors/strips suitably insulated with PVC sleeves/tape shall be used.

The interconnections between bus bars and outgoing feeders of lower ratings can, alternatively, be carried out with suitable sizes of PVC insulated, heavy duty, flexible single core cables having bright annealed copper conductor (as per IS:8130 revised upto date). Cables graded for working voltages of 660/1100 V, shall be as per IS: 694:1984 (Amended to date).

4.5.2.3 Clearances

The minimum clearances to be maintained for open and closed indoor air insulated bus bars/electrically non-exposed and working at system voltages upto 660 volts shall be as follows:

Between	.....	Minimum Clearances
Phase to Earth	.....	26 mm
Phase to Phase	.....	32 mm

4.5.2.4 Bus Bar Markings and Colour Coding

The colours and letters (or symbols) for bus bars:

Main bus bar connections and auxiliary wiring etc. shall conform to relevant Indian Standard. A brief from I.S. 375-1963 (revised) is given below:

For AC bus bars and Main connections

S.No.	Bus Bar & Main Connection	Colour	Letter/Symbol
1.	Three Phase	Red, Yellow,	R, Y, B.

		Blue.	
2.	Single Phase	Red	R
3.	Neutral Connection	Black	N
4.	Connection to earth	Green	G
5.	Phase variable (Such as connections to reversible motors)	Grey	Gy.

4.5.2.5 Phase Sequence and Polarity

Bus bars and main connections, when marked, shall be in accordance with the following table to indicate the order in which the voltage in phases reach their maximum values.

System	As indicated by Colour or letters Vectorially	Phase sequence as indicated
Three Phase	Red, Yellow, Blue	R, Y, B.
Two Phase	Red, Blue	R, B.

4.5.2.6 Arrangement of Bus Bars & Main Connections:

Bus bars and main connections, which are substantially in one plane, shall be arranged in order given as follows:

4.5.2.6.1 **A.C. System**

i) The order of phase connections shall be Red, Yellow and B lue.

ii) When the run of the conductors is horizontal, the red shall be on the top or on the left or farthest away as viewed from the front.

iii) When the run of the conductor is vertical, the red shall be on the left or farthest away as viewed from the front.

iv) When the system has a neutral connection in the same plane as the phase connections, the neutral shall occupy an outer position.

v) Unless the neutral connections can be readily distinguished from the phase connections, the order shall be red, yellow, blue and black.

vi)

4.5.2.6.2 **Terminations**

Incoming terminals shall be suitable for receiving cables. All the terminal ends shall be suitably shrouded.

4.6. RATING AND REQUIREMENTS

4.6.1 AIR CIRCUIT BREAKERS

4.6.1.1 The Air Circuit Breakers shall be desi gned, built and tested in compliance with the latest standered of IEC 60947 part – 2. The circuit breakers shall be sheet metal enclosed, flush front, draw out type and shall be provided with a trip free manual operating mechanism, with mechanical "ON" - "OFF" indications in the front. Shunt trip and time lag fuses suitable for 24 Volts D.C. shall be provided. The Circuit breakers shall be for continuous rating and also shall be suitable for 50 KA fault level at 415 volts. Short time rating for circuit brea ker should be equivalent to 50 KA for 1 second, at 415 Volts. The moving parts of circuit breaker shall have common operating mechanism, primary and secondary isolating devices, auxiliary switches, mechanical position indicators, all mounted on a rigid stu rdy steel frame work. Primary and secondary disconnecting devices shall be self-aligning type and fully isolating.

4.6.1.2 The Air Circuit Breakers shall be equipped with microprocessor based releases and should be compatible to have complete communication capability as an add on feature.

An optional dialogue unit shall be available that makes the following functions possible:

- Remote setting of the parameters for the protection, unit configuration and communication functions.
- Transmission of measurem ents, statuses and alarms from circuit breaker to system.
- Transmission of events and maintenance data from the circuit breaker to the system.

4.6.1.3 Circuit breaker shall be designed to close and trip without opening the circuit breaker compartment door. The door should be interlocked so that the door cannot be opened when the

breaker is on. The operating handle and the mechanical trip push button shall be at the front of the breaker panel and integral with the breaker. The ACB's shall be withdrawal type. The ACB operating spring shall be chargeable with charging motor, as well as, manually also for electrically operated breaker. Spring charging motor will operate on 230V. AC. Once the spring is charged it should be able to close the breaker and also trip without requiring to be charged. Every Trip-Close-Trip operation with one charge of spring shall be possible. The ACB's shall be operable both from the cubicle as well as from remote position. Anti pumping devices shall be used both for electrical and mechanical to prevent the breaker from restricting. Spring charge/discharge indication to be provided.

4.6.1.4 The Circuit breaker shall be of such design that any alteration of its trip point (Calibration), or the time required for its operation, will require dismantling of the device or breaking / opening of a seal for other intended adjustments.

4.6.1.5 Local-remote selector switch with key interlock and auxiliary contacts for local and remote operation shall be provided. The breaker shall be provided with remote control switch, as well as, local control switch for operations. Suitable contacts for "Auto-Trip" annunciation and indication shall be provided.

4.6.1.6 All accessories like U/V, S/T shall be continuous rated and shall be front facia fitted.

4.6.2 CRADLE

4.6.2.1 The cradle shall be so designed and constructed as to permit the smooth withdrawal and insertion of the breaker into it. The movement shall be free from jerks, easy to operate and shall be on steel balls/rollers and not on flat surfaces. The modules shall be totally inter chargeable, for same rating switchgears.

4.6.2.2 There shall be 4 distinct and separate positions of the circuit breaker on the cradle.

Service	:	Both main and secondary isolating contacts in service.
Test	:	Main isolating contacts separate and secondary isolating contacts in service.
Isolated	:	Both main and secondary isolating contacts in isolated position.
Maintenance	:	Circuit breaker fully outside the panel ready for maintenance.

4.6.2.3 There shall be provision for locking the breaker in any, or all of the first three positions.

4.6.2.4 Separate limit switches with minimum 4 'NO' + 4 'NC' potential free contacts, shall be provided for 'Test' & 'Service' position of the breaker. 6 'NO' + 6 'NC' breaker auxiliary contacts shall be available for use.

4.6.3 PROTECTIVE DEVICES

4.6.3.1 C.T. Operated overload and time delayed (100-300 m/second) short circuit tripping mechanism with earth fault protection, through releases, shall be provided for all outgoing circuit breakers.

4.6.3.2 Suitable over voltage tripping mechanism for voltage in excess of 110 % of the rated voltage (415 V) shall be provided in the incoming breaker.

4.6.3.3 Suitable under voltage tripping mechanism for voltage less than 90 % of the rated voltage (415 V) shall be provided in the incoming breaker.

4.6.3.4 All Breakers should be equipped with Microprocessor based protection releases. These release should allow :-

i) Inverse long time – delay trip over load protection.
ii) Inverse short time –delay trip short circuit protection.
iii) Instantaneous short –circuit protection.
iv) Earth fault protection.

4.6.3.5 The direct acting release shall be fitted with test strip for periodical checking of the correctness of trip operations of releases. Provision shall be made for fitting micro switches on over current releases, shunt and under voltage releases for external/remote indication of tripping on faults.

4.6.3.6 Microprocessor based release shall be able for separate fault indications. The releases should be tested for EMI / EMC requirements as per IEC standards.

4.6.3.7 There shall be not less than 4 N/O and 4 N/C auxiliary contacts, rated at 5 amps, on each breaker. The auxiliary contact blocks shall be so located as to be accessible from the front. The auxiliary contacts in the trip circuits shall close before the main contacts have closed. All other contacts shall close, simultaneously, with the main contacts. The auxiliary contacts in the trip circuits shall open after the main contacts open.

4.6.3.8 All current carrying parts shall be silver plated and suitable arcing contacts with proper arc chutes shall be provided to protect the main contacts. The heat generated in the contacts due to tripping

under fault conditions shall be very normal and minimal. Air circuit breakers shall be ISI marked and conform to IS: 13947 and IS: 2516.

4.6.3.9 Total Discrimination shall be achieved between I/C and O/G breakers with LSI feature.

4.6.3.10 Besides the above features, the Release of I/C ACB's of DG and transformers should be able to have:-

i) Protection against reverse power flow. (for DG ACB's).
ii) Protection for phase unbalance.
iii) Active, Reactive and apparent power measurement and management.
iv) Record of trip and alarm histories.

4.6.4 MOULDED CASE CIRCUIT BREAKERS

4.6.4.1 Moulded case circuit breakers shall be designed, built and tested as per the latest Indian Standards i.e. I.E.C.- 60947 Part-2. They shall have the voltage and current ratings, rated duty, rated short circuit breaking capacity and rated short - time withstand current, as indicated.

4.6.4.2 MCCB's shall be of the independent manual closing air-break type, rated for an uninterrupted duty, unless otherwise indicated.

4.6.4.3 Auxiliary facilities, including power closing and under voltage releases, shall be provided as indicated.

4.6.4.4 MCCB should have thermal magnetic releases upto 250 Amp. rating and above 250 Amp. the releases should be Electronic type.

4.6.4.5 Each MCCB shall have a facility for padlocking in the "OFF" position.

a) Necessary set of CTs together with Digital ammeter as specified.

b) Necessary inter-connections to bus bars.

4.6.4.6 Every MCCB shall be provided with a rotary operating mechanism in the front.

4.6.4.7 MCCB shall be mounted vertically unless otherwise specified MCCB shall be capable for live Load reversibility.

4.6.4.8 MCCB shall be provided with the phase spreaders and phase barriers.

4.6.5 CURRENT TRANSFORMERS

Current Transformers shall be provided for main distribution boards carrying current in excess of 60 amps wherever shown in drawing. All phases shall be provided with current transformers of accuracy Class I and suitable VA burden to operate associated metering. C.T.'s shall be capable of withstanding magnetic and thermal stresses due to short circuit faults of 50 KA.

Current transformers shall be in accordance with IS 2707 . Separate C.T.'s shall be used for protective devices.

4.6.6 DISTRIBUTION

All meters and indicating instruments shall be Digital type and in accordance with relevant Indian Standards. The meters shall be flush mounted and drawout type. Indicating lamps shall be LED type and of low burden.

4.6.7 EARTHING

4.6.7.1 All components, frame etc. shall be properly earthed.

4.6.7.2 Aluminium bars of 50 mm x 6 mm (2 Runs) shall be provided for the L.T. panel for the full length of the panel and connected to the framework. Provisions shall be made for connection from this earth bar to the main earthing bar on both sides of L.T. Panel.

4.6.8 PAINTING

All sheet steel shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphating, passivating and then sprayed with a high corrosive resistant primer. The primer shall be baked in an oven. The finishing treatment shall be powder coating with 60 -micron minimum thickness. The painting shall be as per IS: 5 (amended and revised to date).

4.6.9 LABELS

4.6.9.1 Circuit breakers shall be marked with their ampere ratings in a manner that will be durable and visible after installation. Such markings shall be permitted to be made visible by removal of a trim or cover.

4.6.9.2 Circuit breakers rated at 100 amperes, or less, and 500 volts or less, shall have the ampere rating, stamped, etched, or similarly marked into their handles.

4.6.9.3 If a circuit breaker is used on a circuit having an available fault current higher than its marked interrupting rating by being connected on the load side of an acceptable overcurrent - protective device having the higher rating, this additional series combination interrupting rating shall be marked on the end use equipment, such as switchboards and panel boards.

4.6.9.4 Circuit breakers shall be marked with a voltage rating no less than the nominal system voltage what is indicative of their capability to interrupt fault currents betwe en phases or phase to ground.

4.6.9.5 Anodized aluminium PVC labels shall be provided on all incoming and outgoing feeder switches. Circuit diagram showing the arrangement of the circuits inside the LT panel shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.

4.6.10 METERS

All the meters shall be housed in separate compartments, accessible from the front only.

5. TEST AT MANUFACTURERS WORK

All routine tests specified in IS: 8623: 1977 (Amended to date) shal l be carried out and test certificates submitted to the **Engineer.** Typical type test certificate shall also be furnished, as other wise all such tests shall have to be arranged in the factory it self by the fabricators. CPRI test reports if available shall also be submitted. Test for L.T. Panels or any other items costing more than Rs. 5 Lacs shall be done in the presence of Engineer in charge or his nominee at manufacturer place, for which the contractor shall bear all the expenses.

V. INSTALLATION AND COMMISSIONING OF LV PANELS

a. The installation work shall cover assembly of various sections of the panels, lining up, grouting the units etc. In the case of multiple panel switch boards after connecting up the bus bars etc. all joints shall be protected with necessary insulated shroudings. A common earth bar as per IS specifications shall be run at the back of switch board connecting all the sections for connection to frame earth system. All protections and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

b. **Testing And Commissioning**

Commissioning checks and tests shall include all wiring checks and checking up of connections. Primary/Secondary injection tests for the relay adjustment/setting shall be done before commissioning in addition to routine meager test. Checks and tests shall include the following :

i) Operation checks and lubrication of all moving parts.

ii) Interlock function checks.

iii) Continuity checks of wiring, fuses etc. as required.

iv) Insulation test : when measured with 500 V meager the insulation resistance shall not be less than 100 mega ohms.

v) Trip test and protection gear test.

c. **Test witness**

Tests shall be performed in the presence of the Owner's Representative. The contractor shall give at least thirty (30) days advance notice of the date when the tests are proposed to be carried out.

d. **Drawing and Data**

The following information shall be furnished with the shop drawings : -

i) Overall dimensions showing front view, plan, elevation and cross section.

ii) Complete bill of material module wise.

iii) Complete one line diagram.

VI. CABLE WORK

1. DESCRIPTION OF WORK

Supply and laying of cables and cable trays as per specifications schedule of quantities and drawings.

2. APPLICABLE CODES, STANDARDS & PUBLICATIONS

2.1 IS : 1554 (Part-I) : 1.1 KV Grade PVC insulated cables.

2.2 IS : 10242 (Part-3, Section-12) : Installation of cables for low voltage system.

2.3 IS : 7098 (Part-1&2)/IS:5831/ IEC:60502/BS:6746/BS:5467 : Cross linked polyethylene insulated PVC sheathed cables.

Part-I : For working voltages upto & including 1100 Volts.

Part-II : For working voltage from 3.3 KV upto & including 33KV.

2.4	IS : 10810	:	Method of test for cables
2.5	IS : 1255	:	Code of practice for installation & maintenance of power cables upto & including 33 KV rating.
2.6	IS : 8130/IEC : 60228	:	Conductors for cables
2.7	IS : 10418	:	Drums for electric cables.
2.8	IS : 2062, IS : 800, IS : 816	:	Structural wedding steel

3. SUBMITTALS

3.1 Cable schedule as per site conditions & good for construction drawings.

3.2 Layout of various cables on cable tray / trench along with sections showing no. of cables, distance between cables etc, size of cable trays etc.

3.3 Cable tray layout, as per site condition, duly coordinated with other services.

3.4 Test Reports

Routine test certificates for each drum of cable brought to site.

4. SPECIFICATIONS

4.1 **GENERAL**

Cable shall be supplied inspected, laid, tested and commissioned in accordance with drawings, specifications, relevant Indian Standards Specifications and cable manufacturer's instructions. The cable shall be delivered at site in original drums with manufac turer's name clearly written on the drum.

4.2 **MATERIAL**

4.3 The MV power cable of 1100 V. grade shall be XLPE insulated Aluminium conductor armoured stranded cable. The cables shall be provided with inner sheath of extruded black PVC compound type ST-1. The outer sheath shall be resistant to flanges, rodent & termite attack & shall have fire resistant to retardant properties.

4.4 The MV control cables shall be XLPE insulated copper conductor armoured stranded cable with extruded PVC inner and outer sheath si milar to power cables as given in clause above.

4.5 The HT power cable of 33 KV (E) grade shall be XLPE insulated Aluminium conductor armoured stranded cable.

5. CABLE TRAYS

a. Prefabricated Cable trays of ladder type and associated accessories, tees, bend s, elbows & reducers shall be fabricated from 12 gauge (2.6 mm thick) mild steel. Perforated cable trays and associated accessories tees, elbows, and reducers shall be fabricated from 14 guage (2 mm thick) MS steel.

b. Cable trays and accessories and c overs shall be painted with one shop coat of red oxide zinc chromate primer and two coats of Aluminium alkyd paint.

6. **STORAGE AND HANDLING**

a. Cable drums shall be stored on a well drained, hard surface, preferably of concrete, so that the drums do not sink in the ground causing rot and damage to the cable drums.

b. During storage periodical rolling of drums once in 3 months through 90 ^{o} shall be done. Rolling shall be done in the direction of the arrow marked on the drum.

c. It should be ensured that both ends of the cable are properly sealed to prevent ingress/absorption of moisture by the insulation.

d. Protection from rain and sun shall be ensured. Sufficient ventilation between cable drums, should be ensured during storage.

e. The drums shall always be rested on the flanges and not on the flat sides.

f. Damaged battens of drums etc. should be replaced, if necessary.

g. When cable drums have to be moved over short distances, they should be rolled in the direction of the arrow, marked on the drum.

h. For transportation over long distances, the drum should be mounted on cable drum wheels strong enough to carry the weight of the drum and pulled by means of ropes. Alternatively, they may be mounted on a trailer or on a suitable mechanical transport.

i. When unloading cable drums from vehicles, a crane shall preferably be used. Otherwise the drum shall be rolled down carefully on a suitable ramp or rails, where necessary.

j. While transferring cable from one drum to another, the barrel of the new drum shall have a diameter not less than that of the original drum.

k. The cables shall not be bent sharp to a small radius. The minimum safe bending radius for all types of XLPE cables shall be taken as 12 times the overall diameter of the cable. Wherever practicable, larger radius should be adopted. At joints and terminations, the bending radius of individual cores of a multi core cable shall not be less than 15 times its overall diameter.

l. Cable with kinks and straightened kinks or with similar apparent defects like defective armouring etc. shall be rejected.

m. Cables from the stores shall be supplied by the contractor as per the site requirement in pieces cut in the stores.

7. INSTALLATION

7.1 **GENERAL**

The cable installation including necessary joints shall be carried out in accordance with the specifications given herein. For details not covered in these specifications, I.S. 1255 shall be followed.

No straight through joint shall be permitted in the system. The cables shall be supplied as per cable schedule submitted by the contractor & approved by Engineer.

7.2 **ROUTE**

i. Before the cable laying work is undertaken, the route of the cable shall be decided by the Engineer.

ii. While shortest practicable route shall be preferred, cable runs shall generally follow fixed developments such as roads, footh-paths etc. with proper offsets so that future maintenance, identification etc. are rendered easy. Cross country run to shorten the route length is not desirable as it would be set with route identification and maintenance problems, besides posing difficulties during later development of open areas etc.

iii. While selecting cable routes, corrosive soils, ground surrounding sewage and effluent etc. shall be avoided. Where this is not feasible, special precautions as approved by the Engineer shall be taken.

iv. As far as possible, the alignment of the cable route shall be decided taking into consideration the present and future requirements of other agencies and utility services affected by it, the existence of any cable in the vicinity as may be indicated by cable markers or cable schedules or drawing maintained for that area, possibilities of widening of roads/lanes, storm water drains etc. Cable routes shall be planned away from the drains and should be within the property.

v. Whenever cables are laid along well demarcated or established roads, the MV cables shall be laid further from the kerb line than HV cables.

vi. Cables of different voltages and also power and control cables shall be kept in different trenches with adequate separation. Where available space is restricted, MV cables shall be laid above HV cables.

Where cables cross one another the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.

7.3 **WAY LEAVE**

7.4 It may be necessary to obtain way leave for the cable route from the appropriate authorities some of whom are listed below :

a) Drainage, Public Health and Water Works.
b) Telephones and Telegraphs.
c) Gas works.
d) Other Undertakings.
e) Owners of properties.

Where necessary, joint inspection with representatives of other authorities may be arranged so that mutual interests are safeguarded. In case of private property, Section 12/51 of the Indian Electricity Act shall be complied with.

7.5 **PROXIMITY TO COMMUNICATION CABLES**

7.6 Power and communication cables shall as far possible cross at right angles. Where power cables are laid in proximity communication cables the horizontal and vertical clearances shall not normally be less than 60 cms.

7.7 **LAYING METHODS**

7.8 Cables shall be laid direct in ground in pipes/closed ducts, in open ducts or on surface depending on site conditions.

7.9 During the preliminary stages of laying the cable, consideration should be given to proper location of the joint position so that when the cable is actually laid the joints are made in the most suitable places. As far as possible water logged locations, carriage ways, payments, proximity to telephone cable, gas or water mains, inaccessible places, ducts, pipes, racks etc. shall be avoided for joint position.

7.10 **LAYING DIRECT IN GROUND**

7.11 **GENERAL**

This method shall be adopted where the cable route is through open country along roads/lanes etc. and where no frequent excavation are encountered and where excavation is easily possible without affecting other services.

7.12 **TRENCHING**

7.13 **WIDTH OF TRENCH : -** The width of trench shall be determined on the following basis :

a) The minimum width of trench for laying single cable shall be 35 cm.
b) Where more than one cable is to be laid in the same trench in horizontal formation, the width of trench shall be increased such that the inter-axial spacing between the cables, except where otherwise specified shall be at least 20 cm.
c) There shall be a clearance of at least 15 cm between axis of the end cables and the sides of the trench.

7.14 **DEPTH OF TRENCH :-** The depth of trench shall be determined on the following basis :

a) Where cables are laid in single tier formation, the total depth of trench shall not be less than 75 cm. for cables upto 1.1 KV and 1.20 m for cables above 1.1 KV.
b) When more than one tier of cables is unavoidable and vertical formation of laying is adopted, depth of trench in b (i) above shall be increased by 30 cm. for each additional tier to be formed.

7.15 **EXCAVATION OF TRENCHES**

a) The trenches shall be excavated in reasonably straight lines. Wherever there is a change in direction, suitable curvature shall be provided complying with the requirements of Clause 6.6/k.
b) Where gradients and changes in depth are unavoidable, these shall be gradual.
c) Excavation should be done by any suitable means-manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.
d) Adequate precautions should be taken not to damage any existing cables, pipes or other such installations in the proposed route during excavation. Wherever bricks, tiles or protective covers or bare cables are encountered, further excavation shall not be carried without the approval of the Engineer.
e) Existing property exposed during trenching shall be temporarily supported or propped adequately as directed by the Developer's Representative. The trenching in such cases shall be done in short lengths, necessary pipes laid for passing cables therein and the trench refilled in accordance with clause 6 (h)
f) If there is any danger of a trench collapsing and endangering adjacent structures, the sides should be well shored up with timbering and/or sheeting as the excavation proceeds. Where necessary, these may even be left in places when back filling the trench.
g) Excavation through lawns shall be done in consultation with the staff of the department/Owner concerned.
h) The bottom of the trench shall be level and free from stone, brick bats etc. The trench shall then be provided with a layer of clean, dry sand cushion of not less than 8 cm. in depth.

7.16 **LAYING OF CABLE IN TRENCH**

a) At the time of issue of cable for laying, the cores shall be tested for continuity and insulation resistance.
b) The cable drum shall be properly mounted on jacks or on a cable wheel, at a suitable location, making sure that the spindle, jack etc. are strong enough to carry the weight

of the drum without failure and that the spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.

c) The cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains. The entire cable length shall as far as possible be pulled of in one stretch. However, where this is not possible the remainder of the cable may be removed by 'Flaking' i.e. by making one long loop in the reverse direction.

d) i) After the cable has been uncoiled and laid into the trench over the rollers, the cable shall be lifted slightly over the rollers beginning from one end by helpers standing about 10 m apart and drawn straight. The cable should then be taken off the rollers by additional helpers lifting the cable and then laid in a reasonably straight line.

ii) For short runs and sizes upto 50 Sq. mm of cables upto 1.1 KV grade, any other suitable method of direct handling and laying can be adopted with the prior approval of the Engineer.

e) When the cable has been properly straightened, the cores shall be tested for continuity and insulation resistance. In case of PVC cables, suitable moisture seal tape shall be used for this purpose.

f) i) Cable laid in trenches in a single tier formation shall have a covering of clean, dry sand of not less than 17 cms above the base cushion of sand before the protective cover is laid.

ii) In the case of vertical multi-tier formation after the first cable has been laid, a sand cushion of 30 cms. shall be provided over the initial bed before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cms. as stated above. The top most cable shall have a final sand covering not less than 17 cms. before the protective cover is laid.

g) At the time of original installation, approximately 3 m of surplus cable shall be left on each end of the cable and on each side of underground joints (Straight through/Tee/Termination) and at entries and places as may be decided by the Engineer. The surplus cable shall be left in the form of a loop. Where there are long runs of cable length loose cable may be left at suitable intervals as specified by the Engineer.

h) A final protection to cables shall be laid in accordance with Clause 6g (i) to provide warning to future excavators of the presence of the cable and also to protect the cable against accidental mechanical damage by pick-axe blows etc.

i) Unless otherwise specified, the cables shall be protected by second class bricks of not less than 20 cm x 10 cm x 10 cm (nominal size) as per CPWD Building Specification or protection covers placed on top of the sand, (bricks to be laid breadth wise) for the full length of the cable to the satisfaction of the Engineer. Where more than one cable is to be laid in the same trench, this protective covering shall cover all the cables and project at least 5 cm. over the sides of the end cables.

7.17 **Back Filling**

a) The trenches shall be back-filled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered, if necessary, in successive layers not exceeding 30 cm. Unless otherwise specified, a crown of earth not less than 50 mm. in the centre and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of earth however should not exceed 10 cms. so as not to be a hazard to vehicular traffic. The temporary re-instatements of roadways should be inspected at regular intervals, particularly during the wet weather, and any settlement should be made good by further ceased trenches cut through roadways or other paved areas shall be restored to the same density and material as the surrounding area and repaved in accordance with the relevant Specifications to the satisfaction of the Engineer.

b) Where road berms or lawns have been cut or kerb stones displaced, the same shall be repaired and made good except turfing/asphalting to the satisfaction of the Engineer and all surplus earth or rock removed to places as specified.

7.18 **Route Markers**

a) Route markers shall be provided along straight runs of the cables at locations approved by the Engineer and generally at intervals not exceeding 100 m. Markers shall also be

provided to identify change in the direction of the cable route and also for location of every underground joint.

b) Route markers shall be made out of 100 mm x 100 mm x 5 mm GI/Aluminium plate, welded or bolted on to 35 mm x 35 mm x 6 mm angle iron 60 cm. long. Such plate markers shall be mounted parallel to and 0.5 m or so away from the edge of the trench. Alternatively cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) marker 60 cm x 60 cm 10 cm in size shall be laid flat and centred over the cable. The concrete markers unless otherwise instructed by the Engineer shall project over the surrounding surface so as to make the cable route easily identifiable.

c) The work 'cable' and other details such as voltage grading, size etc. as furnished by the Engineer shall be inscribed on the marker.

7.19 **Laying in Pipes/Closed ducts :**

7.20 In location such as road crossing, entry to building, on poles, in paved areas etc. cables shall be laid in pipes of closed ducts.

7.21 GI or Hume Pipes (spun reinforced concrete pipes) shall be used for such purposes. In the case of new construction, pipes as required shall be laid alongwith the Civil works and jointed according to the instructions of the Engineer as the case may be. The size of pipe shall be as indicated in the electrical drawings. GI pipe shall be laid directly in ground without any special bed. Hume pipe (Spun reinforced concrete pipe) shall be laid over 10 cm. thick cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate of 40mm nominal size) bed, after which it shall be completely embeded in concrete. No sand cushioning or tiles need be used in such situations. Unless otherwise specified, the top surface of pipes shall be at a minimum depth of 1mtr. from the ground level when laid under roads, pavement etc.

7.22 Where steel pipes are employed for protection of single core cables feeding AC load, the pipe should be large enough to contain both cables in the case of single phase system and all cables in the case of polyphase system.

7.23 The pipes on road crossing shall preferably be on the skew to reduce the angle of bends as the cable enters and leaves the crossings. This is particularly important for high voltage cables.

7.24 Manholes of adequate size as decided by the Engineer shall be provided to facilitate feeding/drawing in of cables and to provide working space for persons . They shall be covered by suitable manhole covers with frame of proper design. The construction of manholes and providing the cover is not in the scope of this Contract and shall be got executed and paid for by the Engineer through an other agency.

7.25 Pipes shall be continuos and clear of debris or concrete before cable is drawn. Sharp edges at ends shall be smoothened to prevent injury to cable insulation or sheathing.

7.26 Pipes for cable entries to the building shall slope downwards from the building and suitably sealed to prevent entry of water inside the building. Further the mouth of the pipes at the building end shall be suitably sealed to avoid entry of water. This seal in addition to being waterproof shall also be fireproof.

7.27 All chases and passages necessary for laying of service cable connections to buildings shall be cut as required and made good to the original finish and to the satisfaction of the Engineer.

7.28 Cable grips/draw wires and winches etc. may be employed for drawing cables through pipes/closed ducts etc.

7.29 **Laying on Cable Trays**

7.30 Cables, where indicated in approved shop drawings, shall be laid on overhead cable trays which are suspended from ceiling or supported from wall, by anchor fasteners as required.

7.31 The Contractor shall provided for all accessories for the installation of the cable trays, such as bends, tees, reducers coupler plates, trifoil clamps and structural steel members (comprising of channels, angles, flats, rods) to be fabricated at site for structural supports for cable trays racks etc.

7.32 **CABLE TRAY MOUNTING**

Unless otherwise specifically noted on the relevant layout drawing, all cable tray mounting works to be carried out ensuring the following :

a) Cable tray mounting arrangement type to be as marked on layout drawing.

b) Assembly of tray mounting structure shall be supplied, fabricated, erected & painted by the contractor.
c) Tray Mounting structures shall be welded to plate inserts, or to structural beams, as approved by the Engineer.
d) All structural steel to be painted with one shop coat of red oxide and oil primer followed by a finishing coat of Aluminium alkyd paint. When any cuts or holes are made on finished steel work these shall be sealed against oxidation by red oxide followed by the same finishing paint.
e) Cable tray running along the wall should be supported at intervals not exceeding 1.5 m. In case of branching, there should be a support on all branches at a distance of 30 cms from the point of branching. Support should not be less than 40 mm x 40 mm x 5 mm MS angle-secured in an approved manner where runs are along the walls. In case of ceiling suspended cable tray horizontal supports made of 40 mm x 40 mm 5 mm MS angle iron shall be provided. The horizontal interval between two s uch supports shall be 1.0 meter. These supports shall be suspended from C.I. boxes or suitable approved suspension devices such as dash fastener of suitable sizes in the ceiling by means of 10 mm diameter MS rods. All above mounting accessories form part of installation of cable trays.

7.33 **Termination**

7.34 Brass double compression glands shall be provided for MV cables. Termination work shall be carried out only by a licensed/experienced cable jointer.

8 TESTING & COMMISSIONING

8.1 **INSPECTION**

All cables shall be inspected upon receipt at site and checked by the Engineer for any damage during transit.

8.2 **Testing**

i. All 1100 Volt grade cables before laying shall be tested with a 500 V megger or with a 2,500/5,000 V megger for cables of higher voltages. The cable cores shall be tested for continuity, absence of cross phasing, insulation resistance to earth/sheath/armour and insulation resistance between conductors.

ii. All cables shall be subject to above mentioned tests during laying, before covering th e cables by protective covers and back filling and also before the jointing operations.

iii. After laying and jointing, the cable shall be subjected to a 15 minutes AC/DC pressure test.

iv. In the absence of facilities for pressure testing in accordance wi th clause 1.5.3, it is sufficient to test for one minute with 1,000 V meager for cables of 1.1 KV grade and with 2,500/5,000 V meager for cables of higher voltages.

8.3 **Completion plan and completion certificate**

a) After completion of the work the Contract or shall draw completion plans to a suitable scale and shall submit to the Engineer as given in the clause _____ of these Tender Documents. The completion plans shall, inter -alia, give the following details :-

i Layout of cable work

ii Length, size, type and grade of cables.

iii Method of laying i.e. direct in ground, in pipes etc.

iv Location of each joint with jointing method followed.

v Route marker and joint maker with respect to permanent land marks available at site.

vi Wherever the previously laid c able is cut and additional joints are introduced etc., the cable records shall suitably be amended.

VII. EARTHING

1. **DESCRIPTION OF WORK**

The non-current carrying metal parts of electrical installation shall be earthed properly. All metalic structure, enc losures, junction boxes, outlet boxes, cabinets, machine frame, portable equipments, metal conduits, trunking, cable armour, switchgear and all other parts made of metal in close proximity with electrical circuits shall be bonded together and connected by means of specified earthing conductors to an efficient earthing system. Every item of equipment served by the electrical system shall be bonded to earthing system.

2. CODES AND STANDARDS AND APPLICABLE PUBLI CATION

a) Indian Electricity Rules, 1956

b) IS : 3043

3. SUBMITTALS

3.1 Drawing Data

a) Earthing pits layout along with earthing tape routing etc.

3.2 Tests & Test Reports

Test results of all Earthing pit test carried out at site with multiple electrode testing procedure.

4 SPECIFICATIONS

4.1 **EARTHING CONDUCTORS**

G.I. earthing system shall be provided for the single transformer the total number of earth electrodes shall be four numbers (two for neutral and two for body earthing). All the bus ducts/cable trays shall be provided with suitable size of 2 no s. G.I. strips in the full length. All electrical equipment shall be earthed with 2 nos. G.I. strips/wires and non current carrying metallic parts with 1 no. Cu. Strips/wires.

4.2 The resistance to each earthing system shall not exceed 1.0 ohm.

5. EARTHING STATION

5.2 **PLATE ELECTRODE EARTHING**

Earthing electrode shall consist of a **G.I.** plate of dimensions 600 mm x 600 mm x 6.3 mm thick or Copper plate of 600 mm X 600 mm X 3 mm as called for in the Bill of Quantity. The plate electrode shall be buried as far as practicable below permanent moisture level but in any case not less than 3 meters below ground level. Wherever possible, earth electrode shall be located as near the water tap, water drain or a down take pipe as possible. Earth electrode shall be kept clear of the building foundations and in no case shall it be nearer than 2 meters from the outer surface of the wall.

5.3 **CONNECTION OF EARTHING CONDUCTORS**

Main earthing conductor shall be taken from the earth connections at the main distribution panel to the main L.T. panel with which the connection is to be made. For distribution boards, earthing conductors shall run from main distribution boards.

Circuit earthing conductor shall run from the exposed metal of equipment and shall be connected to any point on the main earthing conductor, or its distribution boards or to an earth leakage circuit breaker. Metal conduits, cable sheathing and armouring shall be earthed at the ends adjacent to switch boards at which they originate, or otherwise at the commencement of the run by an earthing conductor in effective electrical contact with cable sheathing. Where equipment is connected by flexible cord, all exposed metal parts of equipment shall be earthed with 2 no. G.I. strips/wires and non current carry ing metallic parts with, 1 no. G.I. strips/wires.

Neutral conductor, sprinkler pipes, or pipes conveying gas, water or inflammable liquid, structural steel work, metallic enclosures cables and conductors, metallic conduits and lightning protection system conductors shall not be used as a means of earthing an installation or even as a link in earthing system. The Electrical resistance of metallic enclosures for cables and conductors measured between earth connections at the main switch boards and any other point on the completed installation shall be low enough to permit the passage of current necessary to operate circuit breakers and shall not exceed 1 OHM.

5.4 **EARTH CONNECTIONS**

All metal clad switches and other equipment carrying single phase circuit sh all be connected to earth by a single connection. All metal clad switches carrying 3 phase shall be connected with earth by two separate and distinct connections. The earthing conductor inside the building wherever exposed shall be properly protected from mechanical injury by running the same in GI pipe of adequate size. The earthing conductor shall be painted to protect it against corrosion. Earthing conductor outside the building shall be laid 600 mm below finished ground level. The over lapping in **G.I.** strips in joints shall be welded. Lugs of adequate capacity and size shall be used for all termination of conductor wires. Lugs shall be bolted to the equipment body to be earthed after the metal is cleaned of paint and other oily substance and properly tinned.

5.5 **PROTECTION FROM CORROSION**

Connection between copper and galavanised equipment shall be made on vertical face and protected with paint and grease. Galvanised fixing clamps shall not be used for fixing earth conductors. Only copper fixing cl amp shall be used for fixing earth conductors. When there is evidence that the soil is aggresive to copper, buried earthing conductors shall be protected by suitable serving and sheathing.

5.6 **ARTIFICIAL TREATMENT OF SOIL**

If the earth resistance is too h igh and the multiple electrode earthing does not give adequate low resistance to earth, as specified in Clause no. 7.4.2 then the soil resistivity immediately surrounding the earth electrodes shall be reduced by adding bentonite powder, sodium chloride, Calcium chloride, sodium carbonate, copper sulphate, salt and soft coke or charcoal in suitable proportions.

6. INSTALLATION

6.1 The earth plate shall be set vertically and surrounded with 150 mm thick layer of charcoal dust and salt mixture. A 20 mm dia GI pipe shall run from the top edge of the plate to the ground level. The top of the pipe shall be provided with a funnel and a mesh for watering the earth through the pipe. The funnel over the GI pipe shall be housed in a masonry chamber approximately 300 mm x 300 mm x 300 mm deep. The masonry chamber shall be provided with a cast iron cover resting over a CI frame. Test facility shall be provided with test links for the earthing station.

7. TESTING & COMMISSIONING

A. Test grounding and bonding system con ductors and connections for tightness and proper installation.

B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacture's recommendations using fall - of-potential method, with multiple electrodes.

List of approved make for Electrical work

S. NO.	POWER DISTRIBUTION EQUIPMENT	APPROVED MAKES
A	MCB Board / MCB's /ELCB's	1. Havells, Indo Kopp, Standard, Action
B	MCB's	Havell's, Indo Kopp, Standard, Action
C	MCCB's	L&T, Siemens, GE power, AVB, MDS Load Star
D	Light/Power/Telephone Wires	Havell's, National, Plaza, CCI, Kallinga, Skytone
E	Steel Conduit, bend and accessories	BEC/AKG/Steel Craft / NIC/Vikas
F	Switches / Sockets (Piano Type)	Anchor, SSK, Leader, Cona, Sainico , Antex, Kingal
G	Phenolic Laminated Sheet 3mm thick	Super, Hylam
H	Ceiling Rose	Anchor,SSK, Leader,Cona, Sainico, Antex, Kingal
I	Cables (i) Power Cable (Upto 1.1KV grade)	CCI/National/GrandLay, Glostar
J	Fitting	Phillips, Bajaj, Crompton, Twinkle
K	Ceiling Fan	Crompton, Bajaj, Orient, Khaitan, Anshul
L	1.1KV cables	Plaza, Polycab, Skytone. Ecko, Havells, Kalinga, National, Phinolex,
M	Meter Board & L.T. Panel	Adhunic, Tricolite, Adlec, Advance or CPRI approved.

Note: - For any other item required to be incorporated in works sample/make shall be got approved from the Engineer-in-Charge

DECLARATION BY THE TENDERER

1. "I hereby accept all the terms and conditions of the tender"

2. It is certified that we have not been blacklisted by any of the department's registration of which is valid in DSIIDC.

(Signature of Tenderer)

CONFIRMATION

I/We confirm that the General Specifications and general conditions appended in the tender documents have been fully examined and fully cognizance taken thereof in arriving at the item unit prices and total amount and tendered sums contained therein my/our tender.

Signature of Tenderer

DELHI STATE INDUSTRIAL AND INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

TECHNICAL BID DOCUMENT

NIT NO. 16/2008-09

NAME OF WORK: Integrated Infrastructure Development of Delhi Govt.Schools
SUB HEAD: IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East Districts (Composite Work).

Name of Contractor : _____

Date of receipt of Application :

Tender Issued on :

Date of opening of Tender : 24.02.2009 at 3.30 P.M.

INDEX

Certified that this tender document contains pages 1 to 3 1 in chronological order.

Executive Engineer (CD-XX)

NOTICE INVITING TENDER

1. The Executive Engineer(CD-XX), DSIIDC on behalf of the Managing Director, DSIIDC invites sealed Item rate bids from reputed firms / contractors in two bid envelope system for the following work :

Sl No	Name of work	Estimated Cost (Rs.in lacs)	Period of Comple -tion
1.	Integrated Infrastructure Development of Delhi Govt.Schools SUB HEAD: Improvement and upgradation of 34 Government School Buildings in East and North-East Districts (Composite Work).	Civil works = 3276.10 Electrical work = 255.89 Total = 3531.99	Twelve months

2. Contractors who fulfil the following requirements s hall be eligible to apply. Joint ventures are not accepted.

   a. Should have satisfactorily completed during the last seven years ending last day of the month 31.12.2008.

      i. Three similar completed works costing not less than amount equal to 30% of estimated cost put to tender or two similar completed work not less than the amount equal to 40% of estimated cost put to tender or one similar completed work costing not less than the amount equal to 60% of estimated cost put to tender.

      and

      ii. One executed work of any nature {either part of (i) above or a separate one} costing not less than 30% of estimated cost put to tender with some central/ state government organization / Central Autonomous Body / Central Public Sector Undertaking.

   Similar works shall mean works of building construction and / or refurbishment of schools, colleges, hostels, hotels, hospitals, shopping / commercial complexes, office complex, residential complex including all civil and electrical works.

The value of executed work shall be brought to the current level by enhancing the actual value of work at simple rate of 7% per annum calculated from the date of completion to last date of receipt of application for tenders.

b. Should have had the average annual financial turnover of **Rs. 1060 lacs** on construction works during the last three years ending March 31st, 2008.
c. Should not have incurred any loss in more than two years during the last five years ending March 31st, 2008

d. Should have a solvency of **Rs. 1413 lacs**.

e. Should have a bid capacity of equal to or more than **Rs. 3531.99 lacs**.

f. Should have registration certificate under the Value Added Tax Act – 2004.

g. Should have valid "No Dues Certificate" from VAT Department or an Affidavit of No Dues Pending and having filled up to date VAT Returns.

h. The firm should have internal electric wing or must associate with himself agency of appropriate class eligible to work for the electrical component individually and shall submit his credentials along with consent letter of associate electrical contractor with the document.

Note:- For works other than Govt. works contractor will be required to enclosed TDS Certificate etc.

3. Bid documents consisting of plans, specifications, the schedule of quantities of the various classes of work to be done and the set of terms and conditions of contract to be complied with by the contractor whose bid may be accepted and other necessary documents can be seen in the office of the Executive Engineer(CD-XX), DSIIDC Udyog Sadan,419 FIE,Patparganj,Delhi-92 between hours of 11.00 AM and 4.00 PM from 30.01.2009 to 16.02.2009 on all working days, except Sunday and Public Holidays. Bid documents, excluding standard form will be issued from his office, during the hours specified above, on payment of Rs.2500/- in case or Demand Draft towards cost of tender document and earnest money of **Rs. 45.32 lacs** in the form of pay order or demand draft or FDR or deposit at call receipt of a scheduled bank issued in favour of Executive Engineer(CD-XIV), DSIIDC (Earnest money of Rs.20 lakhs in form prescribed above and balance in the form of bank guarantee of scheduled bank can be accepted). The FDR/BG shall be valid for a period of six months or more after the date of opening of financial bid.

4. Application supported by prescribed annexure and the financial bid shall be placed in separate sealed envelopes each marked "Eligibility Documents" and "Financial Bid" respectively. Both the envelopes shall be submitted together in another sealed envelope. The bids shall be received upto 3.00 PM on 24.02.2009.

The envelope marked “Eligibility Documents” shall be opened by the Executive Engineer or his authorized representative in his office the same day at 3.30 PM. The time and date of opening of the Financial Bid shall be commun icated at a later date.

a. Pre Bid Conference shall be held at DSIIDC Business Centre, Baba Kharak Singh Marg, Behind Delhi Emporium Building, New Delhi - 110001 on 19.02.2009 at 11.30 AM to clear the doubt of intending tenderers, if any.

b. The Managing Director, DSIIDC reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion

Executive Engineer CD-XX

Prerequisites for Electrical Works: -

1. THIS BEING A COMPOSITE CONTRACT THE ELECTRICAL WORKS CONTAINED IN INTERNAL ELECTRICAL WORKS AND EXTERNAL ELECTRICAL WORKS ARE ESSENTIALLY TO BE EXECUTED BY REGISTERED LICENSED ELECTRICAL CONTRACTOR REGISTERED IN APPROPRIATE CATEGORY / CLASS WITH CPWD, DDA, MCD, NDMC, PWD (DELHI) AND MES UNLESS THE MAIN AGENCY THEMSELVES ARE ALSO REGISTERED WITH CPWD, DDA, MCD, NDMC, PWD (DELHI) AND MES AS ELECTRICAL CONTRACTOR IN THE APPROPRIATE CATEGORY / CLASS.

   ONLY SUCH ELECTRICAL CONTRACTOR WHO SATISFY THE BELOW MENTIONED CONDITIONS SHALL BE ELIGIBLE TO EXECUTE THE ELECTRICAL COMPONENT OF THE WORK.

   (a) They should have completed successfully in their own name at least in last seven years.

      i. One electrical work of value not less than 205.00 Lacs contained in Vol-II of tender.

      Or

      ii. At least two electrical works each of value not less than 154.00 Lacs contained in Vol-II of tender.

      Or

      iii. At least three works each not less than 103.00 Lacs contained in Vol-II of tender.

   (b) They should possess valid electrical license authorizing them to undertake electrical works of this nature in Delhi.

      i. The main agency shall submit name of the electrical contractor along with their credentials at pre-bid stage. Willingness letter in the enclosed Performa form both i.e. the main agency approving such engagement and the associated electrical agency confirming undertaking of this job.
      ii. Engineer-in-Charge i.e. Executive Engineer (Elect.) shall approve the eligible electrical contractors as associates of the main agency. Nominations once accepted shall be final & binding.

2. IT WILL BE OBLIGATORY ON PART OF THE ASSOCIATED ELECTRICAL CONTRACTOR AND THE MAIN AGENCY TO SIGN THE TENDER DOCUMENTS FOR ELECTRICAL COMPONENT OF THE CONTRACT WITH EXECUTIVE ENGINEER (ELECT.).

3. AWARD OF WORK TO THE MAIN AGENCY SHALL SPECIFY THE ACCEPTED VALUE OF ELECTRICAL WORK & NAME OF THE ASSOCIATED ELECTRICAL AGENCY. COPY OF AWARD LETTER SHALL BE ENDORSED TO BOTH AGENCIES I.E. THE MAIN AGENCY FOR TOTAL ACCEPTED VALUE OF WORK & THE ELECTRICAL CONTRACTOR FOR ACCEPTED VALUE OF ELECTRICAL COMPONENT OF WORK. A TRIPLICATE AGREEMENT SHALL BE EXECUTED BETWEEN ELECTRICAL CONTRACTOR, MAIN CONTRACTOR & EXECUTIVE ENGINEER ELECTRICAL.

4. AFTER AWARD OF WORK THE EXECUTIVE ENGINEER (ELECT.) SHALL ENTER INTO A TRIPARTITE AGREEMENT AS ENGINEER-IN-CHARGE FOR VOL-II OF THE JOB I.E. (ELECTRICAL COMPONENT WITH THE MAIN AGENCY AND THE ASSOCIATED ELECTRICAL AGENCY. THE ELECTRICAL CONTRACTORS SHALL THEREFORE BECOME PARTY TO THE CONTRACT & ALL RESPONSIBILITIES FOR ELECTRICAL WORKS SHALL BE DISCHARGED BY THEM FOR AND ON BEHALF OF THE MAIN AGENCY.

5. Completion certificate if required for electrical work shall be issued in favour of the electrical contractors for electrical contractor for electrical component of the work. Main agency can also be issued successful completion certificate for electrical work indicating value of job & mention that the work was got executed by them through the …….. (Name of electrical contractor) as main agency.

6. Payments to the extent of at least 85% of the contract amount (electrical component) shall be released directly to the electrical agency, in case of request of electrical Contractor. The clause shall be applicable in case of complaint for non payment/delay payment is received from the electrical Contractor.

7. No change in the electrical agency shall permitted without prior approved of the department. In case of dispute between the two agencies, the main agency with the prior approval of department shall have to submit fresh three names of electrical contractors qualifying as per terms stated above. The approval of the department for such change shall be essential.

Executive Engineer
Electrical Division-1
DSIIDC

SECTION - I
BRIEF DESCRIPTION OF WORK

Brief Description of Work :

Background :

Department of Education (DoE), Government of Delhi, assigned 198 school premises to Delhi State Industrial Infrastructure Development Corporation (DSIIDC) for refurbishment. DSIIDC engaged IL&FS Education and Technology Services (IETS) to prepare a school-wise improvement plan to refurbish /revamp the 198 schools.

All schools have been surveyed, assessment reports of the present condition of all schools, proposed layouts and scope of intervention along-with Detailed Estimates for each school has been prepared both on the basis of intervention parameters that was structured under the composite project plan and the individual requirements of the schools.

A project vision was articulated in conjunction with the DoE, Government of Delhi, for Project Roopantar on which a composite project plan was developed as benchmarks for various infrastructure up-gradation. The requirement of each school varies in terms of existing infrastructure and extent of repairs required at the different sites. However broadly all infrastructure improvement fall under common parameters which were subsequently identified and defined.

Broadly the up-gradation would address the following interventions :

i. Up-gradation of all external services, including electrical, plumbing and sanitation works;
ii. Provision for fire-fighting and works related to fire safety compliance including change of Main Gate and second door to the classrooms of the school to comply with fire safety norms ;
iii. Provision of overhead water storage tanks for treated drinking water and underground water storage tank for other uses including hand-wash, toilet flushing, gardening, etc.
iv. Connection to Municipal Sewer Line, wherever possible, and revival of existing septic tanks in case of absence of the same.
v. Provision of Rain Water Harvesting system including pump house and water tanks;
vi. Development works like site grading for storm water drainage, internal pathways, horticulture operations, multi-purpose playground development, and other sports facilities;
vii. Provision and up-gradation of toilet facilities
viii. Provision of Drinking Water facilities to meet requirements.
ix. Complete painting work on site;
x. Rehabilitation of RCC Structures in response to the structural soundness of existing structures
xi. Demolition of all existing Tin Shed Structures and construction of new G+1 Structures where required General repairs to Boundary Wall along with increase in height using concertina wire.

Brief Description of Work :

As part of the work under Project Roopantar, 34 Government schools are being proposed to be taken up in a cluster for Improvement and Upgradation Works as given above. The schools are located in East and North East Districts of Delhi. In the present cluster the civil work have been taken for all the 34 schools however electrical works for 23 schools have been added It is proposed that the entire works (civil and electrical) will be awarded to a single party demonstrating the capability of completion of the works in the defined time.
The Schools that are being taken up are as follows :

1) Sabhapur (DI- 1104011)
2) Gautam puri (ID- 1105023/1105002)
3) Nand Nagri (ID-1106014/1106026)
4) New Seelampur No 2 (ID 1105025/1105004)
5) Dilshad Garden Blk J &K (ID-1106023/1106012)
6) Nand Nagri Blk E (ID- 1106003/1106113)
7) Old Seemapuri Blk GH (ID-1106122)
8) New Usmanpur (ID-1105107/1105117)
9) Khajoori Khas (ID-1104153/1104015)
10) Shastri Park (ID-1105021/1105011
11) Dayalpur (ID-1104010/1104026)
12) Ghonda No 2 (ID-1104019/1104007)
13) Dilshad Garden Blk C (ID-1106025/1106002)
14) Chauhan Bangar(ID-1105112/1105115)
15) New Seelampur No 1 (ID-1105020/1105009)
16) Mansarover Park (ID-1106006/1106020)
17) GT. Road Shahdara (ID- 1105013/1105029)
18) East Gokulpur (ID-1106253)
19) East of Loni Road (ID-1106118/1106024)
20) Gokulpur Village (ID-1104004/1104021)
21) Nand Nagri Blk D (ID-1106116/1106119
22) Shahdara GT Road (ID-1105024/1105001)
23) Vijay Park (ID-1104029/1104151)
24) Baberpur (ID-1105019/1105007)
25) Shahdara No.2 (ID-1106114/1106007
26) Ashok Nagar (ID-1106010/1106112)
27) Mandoli (ID-1106019/1106005)
28) Shahdara (ID-1105110/1105006)
29) Brahampuri (ID-1105003/1105026)
30) Yamuna Vihar (ID-1104023/1104001)
31) Bhajanpura (ID-1104012/1104150)
32) East Rohtash Nagar (ID-1105012/1105028)
33) Sonia Vihar (ID-1104335/1104336)
34) Shivaji Shahdara(ID-1105022/1105005)

NOTE : The quantities mentioned against individual schools as per Annexure I & II are tentative and can vary on either side depending on site conditions & scho ols can also change or vary nothing extra on this changes shall be allowed.

SECTION – II

INFORMATION & INSTRUCTIONS FOR BIDDERS

INFORMATION & INSTRUCTIONS FOR BIDDERS

1.0 **GENERAL**:

1.1 Letter of transmittal and forms for deciding eligibility are annexed.

1.2 All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reasons, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column a "Nil" or "No such case" entry should be made in that column. The bidders are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the bid being summarily disqualified. Bids made by telegram or telex and those received late will not be entertained.

1.3 The bidder should sign each page of the bid.

1.4 Overwriting should be avoided. Correction, if any should be made by neatly crossing out initialing, dating and rewriting. Pages of the eligibility criteria document are numbered. Additional sheets, if any added by the contractor, should also be numbered by him. They should be submitted as a package with signed letter of transmittal.

1.5 References, information and certificates from the respective clients certifying suitability, technical knowledge or capability of the bidder should be signed by an officer not below the rank of Executive or equivalent.

1.6 The bidder may furnish any additional information which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of Eligibility Criteria document unless it is called for by the employer.

1.7 Any information furnished by the bidder found to be incorrect either immediately or at a later date, would render him liable to be debarred from tendering / taking up of work in DSIIDC.

1.8 It is the responsibility of the contractor to satisfy himself with the statutory rules, taxes applicable and work contract rules etc. as and when they are applicable for execution of work.

1.9 The tender containing Technical and Financial bid in prescribed form duly completed and signed should be put in separate sealed cover and thereafter both these envelopes should be put in other envelope superscribed with "Tender Document for Composite Work of East and North East districts – 34 schools" shall be received by the Executive Engineer (CD-XX) at DSIIDC, Udyog sadan,419,FIE,Patparganj,Delhi-92 or his authorised representative upto 3.00 PM on 24.02.2009.

2.0 **DEFINITIONS**:

2.1 In this document the following words and expressions have the meaning hereby assigned to them.

2.2 Employer: Means the Managing Director, DSIIDC, acting through the Executive Engineer (CD-XIV), DSIIDC Udyog sadan,419,FIE,Patparganj,Delhi-92.

2.3 Bidder: Means the individual Proprietary Firm, Firm in partnership, Limited company Private or public or Corporation.

2.4 "Year" means "Financial Year" unless stated otherwise.

2.5 The Executive Engineer supervising the work should be deemed to be Engineer in-charge for all purpose for the work. However the final bill will be paid by the Executive Engineer CD-XIV, executing the agreement.

3.0 METHOD OF APPLICATION

3.1 If the bidder is an individual, the application shall be signed by him above his full type written name and current address.

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

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

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

4.0 FINAL DECISION MAKING AUTHORITY

The employer reserves the right to accept or reject any bid and to annul the process and reject all bids at any time without assigning any reasons or incurring any liability to the bidders.

5.0 PARTICULAR PROVISIONAL

The particulars of the work given in Section I are provisional. They are liable to change and must be considered only as advance information to assist the bidder.

6.0 SITE VISIT

The bidder is advised to visit the site of work at his own cost and examine it & its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.

7.0 INITIAL CRITERIA FOR ELIGIBILITY

Satisfactory completion of

- Three similar completed works each costing not less than **Rs. 1060 lacs**.

OR

- two similar completed works, each costing not less than **Rs. 1413 lacs**

OR

- one similar completed work, costing not less than **Rs. 2120 lacs** during the last seven years ending last day of the month previous to the one in which the bids are invited.

And

One completed work of any nature {either one of above or a separate one} costing not less than **Rs. 1060 lacs** with some Central / State Government Organisation / Central Autonomous Body / Central Public Sector Undertaking

Definition of Similar Works for work exp erience

Similar works shall mean works of building construction and / or refurbishment of schools, colleges, hostels, hotels, hospitals, shopping / commercial complexes, office complex, residential complex including all civil and electrical works.

The value of executed works shall be brought to the current costing level by enhancing the actual value of the work at a simple rate of 7 % per annum, calculated from the date of completion to last date of receipt of application of tenders

Turn over

1. The bidder should have had average annual financial turn over (gross) of at least **Rs. 1060 lacs** on Civil & Electrical construction works during the immediate last three consecutive financial years. This should be duly audited by a Chartered Accountant. Year in which no turnover is shown, would also be considered for working out the average.
2. The bidder should not have incurred any loss in more than two years during the immediate last five consecutive financial years, duly certified by the Chartered Accountant.
3. The bidding capacity of the contractor should be equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:
   Bidding Capacity = [AxNx2] -B
   Where
   A= Maximum value of construction works executed in any one year during the last seven years taking into account the completed as well as works in progress.

   N= Number of years prescribed for completion of work for which bids have been invited.

   B= Value of existing commitments and on -going works to be completed during the period of completion of work for which bids have been invited.
4. The bidder should have a solvency of the amount **Rs. 1413 lacs**, certified by his Banker.
5. The bidder should own construction equipment as per list required for the p roper and timely execution of the work. Else, he should certify that he would be able to

manage the equipment by hiring etc. and submit the list of firms from whom he proposes to hire. The certificate should state the equipment so hired will be available to the bidder exclusively during the period of the contract / satisfactory completion of works.

6. The bidder should have sufficient number of Technical and Administrative employees for the proper execution of the contract. The bidder should submit a list of these employees stating clearly how these would be involved in this work.
7. The bidder's performance for each work completed in the last seven years and in hand should be certified by an officer not below the rank of Executive Engineer or equivalent and should be obtained in sealed cover.
8. The firm should have internal electric wing or must associate with himself agency of appropriate class eligible to work for the electrical component individually and shall submit his credentials along with consent letter of associate electrical contractor with the document.
9. An Applicant should, in the last three years, have neither failed to perform on any contract, as evidenced by imposition of a penalty by an arbitral or judicial authority or a judicial pronouncement or arbitration award against the Applicant, nor been expelled from any project or contract nor have had any contract terminated for breach by such Applicant.
10. Credential of electrical contractor should be submitted in the technical bid in accordance with illegality criteria mentioned in financial bid.
11. EE(CD-XX) shall be the over all in charge of project as well as noodle officer, however the respective EE's under whose jurisdictional the schools fall shall deemed to be engineering charge for all the purposes for those works execution.

8.0 Evaluation Criteria

1. The detail submitted by the bidders will be evaluated in the following manner:
2. The initial criteria prescribed in paras 7.1 to 7.5 above in respect of experience of similar class of works completed, bidding capacity and financial turnover etc. will first be scrutinised and the bidder's eligibility for the work be determined.
3. The bidders qualifying the initial criteria as set out in paras 7.1 to 7.5 above will be evaluated for following criteria by scoring method on the basis of details furnished by them:

(a) Financial strength (Form" A" & "B")	Maximum 20 Marks
(b) Experience in similar nature of work during last five years / Experience in other nature of works during the last three years (Form"C")	Maximum 25 Marks
(c) Performance on works (Form "E") -	
- Time over run	Maximum 20 Marks
- Quality	Maximum 15 Marks
(d) Personnel and Establishment (Forms "F" & "G")	Maximum 10 Marks
(e) Plant & Equipment (Form"H")	Maximum 10 Marks
Total	100 Marks

To become eligible for short listing, the bidder must secure at least fifty percent marks in each and sixty percent marks in aggregate. The department, however, reserves the right to restrict the list of such qualified contractors to any number deemed suitable by it.

4. Even though any bidder may satisfy the above requirements, he would be liable to disqualification if he has:
   (a) made ***misleading or false representation or deliberately suppressed the information*** in the forms, statements and enclosures required in the eligibility criteria document,
   (b) record of poor performance such as abandoning work, not properly completing the contract, or financial failures/weakness etc.

9.0 Financial Information

Bidder should furnish the following financial information:

Annual financial statement for the last five years in (Form "A") and solvency certificate in (Form "B").

10.0 Experience in Works Highlighting Experience in Similar Works

1 Bidder should furnish the following:
   (a) List of all works of similar nature successfully completed during the last five years in (Form "C")
   (b) List of the projects under execution or awarded in (Form "D")

2. Particulars of completed works and performance of the bidder duly authenticated/ certified by an officer not below the rank of Executive Engineer or equivalent should be furnished separately for each work completed or in progress in (Form "E")
3. Information in (Form "D" should be complete and no work should be left out.

11.0 Organisation Information

Bidder is required to submit the information in respect of his organisation in (Forms "F" & "G")

12.0 Construction Plant & Equipment

Bidder should furnish the list of construction plant and equipment including steel shuttering, centring and scaffolding to be used in carrying out the work (in Form "H"). Details of any other plant & equipment required for the work not included in Form "H" and available with the bidder may also be indicated.

13.0 Letter of Transmittal

The bidder should submit the letter of transmittal attached with the document.

14.0 Opening of Price Bid

After evaluation of applications, a list of short listed agencies will be prepared. Thereafter, the financial bids of only the technically qualified bidders s hall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives. The validity of the tenders shall be reckoned from the opening of the price bids. The price bids shall be opened within 30 days of the date of receipt of tenders.

15.0 Award Criteria

1. The employer reserves the right, without being liable for any damages or obligation to inform the bidder, to:
   (a) Amend the scope and value of contract to the bidder.

   (b) Reject any or all the bids without as signing any reason.
2. Any effort on the part of the bidder or his agent to exercise influence or to pressurise the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

SECTION – III

INFORMATION FOR TECHNICA L EVALUATION

CRITERIA FOR EVALUATION OF THE PERFORMANCE OF CONTRACTORS FOR PRE-ELIGIBILITY.

Attributes		Evaluation
(A) Financial strength	**20marks**	(i) 60% marks for minimum eligibility criteria.
(i) Average annual turnover	16marks	(ii)100% marks for twice the minimum eligibility criteria or more
(ii) Solvency certificate	04marks	In between (i)&(ii)—on pro- rata basis
(B) Experience in similar class of works	**25marks**	(i)60% marks for minimum eligibility criteria (ii)100% marks for twice the minimum eligibility criteria or more. In between (i)&(ii)—on pro-rata basis
(C) Performance on Works (Time over run)	**20 marks**	

Parameter	Calculation for points				Score	Max. Marks
						10
	If TOR=	1.00	2.00	3.00	>3.50	
(a) Without levy of compensation		20	15	10	10	
(b) With levy of compensation		20	5	0	-5	
(c) Levy of compensation not decided		20	10	0	0	

TOR= AT/ST, where AT-Actual Time; ST= Stipulated Time

Note: Marks for value in between the stages indicated above is to be determined by straight line variation basis.

(D) Performance of works (Quality) **15 marks**

(i)	Very Good	15
(ii)	Good	10
(iii)	Fair	05
(iv)	Poor	00

(E) Personnel and Establishment **10 marks**

(i)Graduate Engineer	3marks for each
(ii)Diploma-holder Engineer	2marks for each upto max 4 Marks
(iii) Supervisory/Forman	1 mark for each upto Max 3 Marks

(F) Plant & Equipment 10 **marks**
(refer to Form H)

Earth moving equipment	
Excavators	1 mark each upto max. 2 marks
Equipment for concrete work	1 mark each upto max. 2 marks
Concrete mixer (diesel)	
Concrete mixer (electrical)	
Needle vibrator (electrical)	
Needle vibrator (petrol)	
Equipment for building work	1 mark each upto max. 2 marks
Bar bending machine	
Bar cutting machine	
Drilling machine	
Welding generators	
Welding transformer	
Cube testing machines	
Steel shuttering	2 marks each for 800 sq.mtr. upto 4 marks
Grinding/polishing machines	
Equipment for transportation	1 mark each upto max. 2 marks
Trucks	
Mini Trucks / Tempos	
Pneumatic equipment	1 mark each upto max. 2 marks
Air compressor (diesel)	
Power equipment	1 mark each upto max. 2 marks
Diesel generators	

LETTER OF TRANSMITTAL AND FORMS A TO H

LETTER OF TRANSMITTAL

From:

To,

The Executive Engineer(CD)-XX
DSIIDC
Udyog Sadan,
419 F.I.E.,
Patpar Ganj, Delhi – 110092.

NAME OF WORK: Integrated Infrastructure Development of Delhi Govt.Schools
SUB HEAD: IMPROVEMENT AND UPGRADATION OF 34 Government School Buildings in East and North East Districts (Composite Work).

Sir,

Having examined the details given in Press Notice and bid document for the above work, I/we hereby submit the relevant information.

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

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

3. I/We submit the requisite certified solvency certificate and authorize the Executive Engineer (CD)-XIV, DSIIDC, to approach Bank issuing the solvency certificate to confirm the correctness thereof. I/We also authorize EE (CD)-XIV, DSIIDC to approach individuals, employers, firms and corporations to verify our competence and general reputation.
4. I/We submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following w orks:

Name of Work Certificate from

Enclosures:
Seal of bidder

Date of submission

Signature(S) Of Bidder(S)

FORM 'A'
FINANCIAL INFORMATION

1. **Financial Analysis – Details to be furnished duly supported by figures in balance sheet/profit & loss account for the last five years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached)**

YEARS

(i) Gross Annual turn over on construction works
(ii) Profit / Loss.

II. Financial arrangements for carrying out the proposed work.

III. Solvency certificate from bankers of the bidder in the prescribed Form "B"

Signature of Chartered Accountant with Seal **Signature of Bidder(s)**

FORM "B"

FORM OF BANKERS CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that M/s / Sh._____ having marginally noted address, a customer of our bank are/is respect able and can be treated as good for any engagement upto a limit of Rs._____ (Rupees _____)
This Certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature)
For the Bank

NOTE (1) Bankers certificates should be on letterhead of the Bank, sealed in cover addressed to tendering authority.

(2) IN case of partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM "C"

DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST FIVE YEARS ENDING LAST DAY OF THE MONTH _____

S. No.	Name of work/Project and location	Owner of sponsoring organization	Cost of work in Crores of Rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases/ pending/in progress with details*	Name and address/telephones number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

* Indicate gross amount claimed and amount awarded by the Arbitrator

Signature Of Bidder(S)

FORM "D"

PROJECTS UNDER EXECUTIONS OR AWARDED

S. No.	Name of work/Project and location	Owner or sponsoring organization	Cost of work in Crores of Rupees	Date of commencement as per contract	Stipulated date of completion	Upto date percentage progress of work	Slow Progress if any and reasons thereof	Name and address/telephones number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

Certified that the above list of works is complete and no work has been left out and that the information given is correct to my knowledge and belief.

Signature Of Bidder(S)

FORM "E"

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORM B & C

1. Name of work / Project & Location
2. Agreement No.
3. Estimated cost
4. Tendered Cost
5. Date of start
6. Date of Completion
   - i) Stipulated date of completion
   - ii) Actual date of completion
7. Amount of compensation levied for delayed completion, if any
8. Amount of reduced rate items, if any
9. Performance Report

i)	Quality of work	Very Good/Good /Fair/ Poor
ii)	Financial Soundness	Very Good/Good /Fair /Poor
iii)	Technical Proficiency	Very Good/Good /Fair /Poor
iv)	Resourcefulness	Very Good/Good /Fair/ Poor
v)	General Behavior	Very Good/Good /Fair/ Poor

Dated: Executive Engineer or Equivalent

FORM "F"

STRUCTURE & ORGANIZATION

1. Name & Address of the bidder

2. Telephone No./Telex No./Fax No.

3. Legal status of the bidder (attach copies of original Document defining the legal status)

   a) An Individual
   b) A proprietary firm
   c) A firm in partnership
   d) A limited company or Corporation

4. Particulars or registration with various Government bodies attach attested photocopy)

Organization / Place of registration No.	**Registration No.**
1.	
2.	
3.	

5. Name and titles of Directors & officers with designation to be concerned with this work.

6. Designation of individuals authorized to act for the organization.

7. Was the bidder ever required to suspend construction for a period of more than six months continuously after you commenced the construction ? If so, give the name of Project and reasons of suspension of work.

8. Has the bidder, or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion ? If so, give name of the project and reasons for abandonment.

9. Has the bidder, or any constituent partner in case of partnership firm ever been debarred/ black listed for tendering in any organization at any time ? If so, give details.

10. Has the bidder, or any constituent partner in case of the partnership firm, ever been convicted by a court of law ? If so, give details.

11. In which field of Civil Engineering construction the bidder has specialization and interest?

12. Any other information considered necessary but not included above.

Signature Of Bidders(S)

FORM "G"

DETAILS OF TECHNICAL & ADMINISTRATIVE PERSONNEL TO BE EMPLOYED FOR THE WORK

S.No.	Designation	Total Number	Number available for this work	Name	Qualification	Professional experience and details of work carried out	How these would be involved in this work	remarks
1	2	3	4	5	6	7	8	9

Signature Of Bidder(S)

FORM 'H'

DETAILS OF CONSTRUCTION PLANT AND EQUIPMENT LIKELY TO BE USED IN CARRYING OUT THE OWRK

S.No.	Name of equipment	Nos.	Capacity or type	Age	Condition	Ownership Status			Current Location	Remarks
						Presently owned	Leased	To be purchased		
1	2	3	4	5	6	7	8	9	10	11
1.0	**Earth moving equipment**									
	Excavators									
2.0	**Equipment for concrete work**									
2.1	Concrete mixer (diesel)									
2.2	Concrete mixer (electrical)									
2.3	Needle vibrator (electrical)									
2.4	Needle vibrator (petrol)									
2.5	**Equipment for building work**									
2.6	Bar bending machine									
2.7	Bar cutting machine									
3.0	Drilling machine									
3.1	Welding generators									
3.2	Welding transformer									
3.3	Cube testing machines									
3.4	M.S. Pipes									
3.5	Steel shuttering									
3.6	Steel scaffolding									
3.7	Grinding/polishing machines									
3.8	**Equipment for transportation**									
3.9										
3.10	Trucks									
3.11	**Mini Trucks / Tempos**									
4.0										
	Pneumatic equipment									
4.1										
4.2	Air compressor (diesel)									
	Power equipment									

5.0 **5.1** **6.0** **6.1** **7.0** **7.1**	Diesel generators **Any other plant/equipment …….** **…….**									

Signature of Bidder(s)

UNDERTAKING

I, the undersigned do hereby undertake that our firm M/s _____ agree to abide by this bid for a period of ninety days from th e opening of Financial Bids and it shall be binding on us and shall be accepted at any time before the expiration of that period.

(Signed by an Authorized Officer of the firm)

Designation of the Officer

Name of Firm

Date

DECLARATION

I / We declare that a I / We made myself / ourselves thoroughly conversant with the local conditions viz. approaches to site, availability of building material and other components involved / available at site for timely execution of the work etc. and I / We has b ased my / our rates for these works accordingly. I / We have carefully gone through and hence understood all items of the work to be executed through the Tender process.

Signature of bidder