

# Office of the T.I.C. M. G. College, Lalpur

Lalpur, Purulia –PIN-723130 // Email: mgclalpur@yahoo.co.in // Tel. 03252-240251

Memo No. 71/MGC/16

Dated: 11.6.2016

## **NOTICE INVITING E-TENDER**

NIT NO: 1/2016-17

1. TIC, M.G.College, Lalpur invites E-Tender under two envelope system (Technical Bid details Prapers & EMD with Tender Cost) from eligible bonafide bidders having requisite credentials upto 3.00 PM of 04.07.2016 for the works as mentioned below.

### **ANNEXURE-I**

	Name of work	Tender Amount (Rs.)	Earnest Money (Rs.)	Price of Technical & financial bid documents and other annexures	Period of completion	Eligibility of contractor
1	2	3	4	5	6	7
1.	Construction of Proposed Science Building at Ground Floor at M.G.College, Lalpur	62,62,782.00	1,25,256.00	Rs. 2000/-	180 days	Bonafide contractors having requisite credential of execution of similar work valued at least 40 % value in single work (completed only) executed during last 5 years.

#### **1) Eligibility Criteria:-**

- Financially capable & bonafide contractors of Central and State Govt, Zilla Parishads, Central & State Govt. Undertaking, Municipalities and Govt. recognized Autonomous Bodies having experience of execution of similar nature of work will be eligible for participation in tender provided that they have the credential having ( the value of single work of similar nature executed by the contractor during the last five years excluding current financial year should not be less than 40% (Forty percent) of the estimated amount put to tender) against the group(s) as mentioned in Annexure –I for which the application is made. Payment certificate/ completion certificate should show the value of works completed and payment made against each individual works during each year aggregating the last three years including the current financial year.
- Bonafide contractors having credentials of executing of similar works valued at least 40% in single works executed during last 5 years.
- Annual turnover of execution of Civil works only minimum 100% of Tender value during last 3 years. ( Certified by C.A.)
- Bid Capacity of 100% of Tender value (B=M x T – W) M=2, T= Annual Turnover, W= Working in hand.

e. Registered Labour & Engineer Co-Operative societies are required to furnish

valid Bye Law, current Audit report, valid certificates from ARCS along with other relevant supporting papers.

**2) Earnest Money:-**

Cost of tender document and earnest Money may be remitted through Bank Draft / Pay Order issued from any Nationalized Bank to be drawn in favour of the **TIC, M.G.College, Lalpur**. The original part of submission of EMD (Earnest Money Deposit) should be submitted physically to **office of the TIC, M.G.College, Lalpur**, under sealed cover as per schedule time. The scanned copy of the above Bank Draft/Pay Order to be submitted online as per scheduled time.

The earnest money of the successful tendered (being converted to security deposit) deposited, will remain under the custody of the department till satisfactory completion of the work in full including extended quantity if ordered for. Besides this, necessary percentages shall be deducted from the progressive tenders so as to make it 10% (Ten percent) of the value of work billed for.

The Earnest Money of the unsuccessful Tenderer (s) will be refunded from **the office of the TIC, M.G.College, Lalpur** after He/She/They is/are to apply for the same, giving the reference of the Work, NIT No., date of Tender etc.

In case of re-tender no E.M.D is required for the tenderer who responded to the first tender but did not get back the E.M.D deposited with the first tender.

**3) Time Schedule:-**

Sl. No.	PARTICULAR	DATE & TIME
i)	Date of uploading of N.I.T and Tender Documents (online) (Publishing date)	11.06.2016
ii)	Documents Sell / download start date (online)	13.06.2016 at 10.00 A.M
iii)	Documents Sell / download End date (online)	04.07.2016 upto 2.00P.M
iv)	Tender Submission Upload Start date (online)	13.06.2016 at 11.00 A.M
v)	Tender Submission Upload End date (online)	04.07.2016 upto 5.00 P.M
vi)	Last date of submission of original copies for earnest money and cost of tender documents (offline).	04.07.2016 up to 3.00 P.M.
vii)	Date & Place for Opening of Tender (online Technical Bid)	09.07.2016 at 11.00 A.M. TIC, M.G.College, Lalpur
viii)	Date of uploading the financial list of technically qualified bidders (online) after disposal of appeals	As per notice
ix)	Date of opening financial approval.	As per notice

**4) Both technical Bid and financial Bid are to be submitted concurrently duly digitally signed.**

### **5) Documents to be uploaded by the Tenderer:-**

- (i) All intending Tenderer are required to produce current Bank solvency certificate Income Tax return (for the assessment year 2015– 2016) as submitted along with PAN, VAT registration Certificate & Professional Tax receipt Challan for the year 2015 – 2016, Trade License and Credentials as stated above in technical Bid
- (ii) Financial offer in Financial Bid.

### **6) Agreement:-**

The successful Tenderder shall have to execute Formal Agreement with **TIC, M.G.College, Lalpur** in two copies of printed form no. W.B.F. 2911(ii) within 10 (Ten) days from the issuance of Letter of Acceptance. All document required for execution of Formal Agreement along with WBF 2911(ii) are to be purchased from this office on usual payment. The Formal Agreement comprises of the following documents and forms a part of the Agreement.

- i) WBF 2911 (ii) printed form
- ii) Notice Inviting Tender
- iii) Special Terms & Conditions
- iv) Technical Specification
- v) Letter of Acceptance.
- vi) BOQ.
- vii) Drawing

### **7) Validity of Tender:-**

Tenders will remain valid for a period not less than 180 days (One Hundred Eighty days) from last date of submission of Tender.

### **8) Tender Inviting Authority:-**

**TIC, M.G.College, Lalpur**

### **9) Tender Accepting Authority:-**

**TIC, M.G.College, Lalpur**

### **10) Other Information:-**

- a) There shall be no provision of Arbitration. Hence clause 25of the West Bengal Form No. 2911(ii) shall not be allowed vide memo no.558/SPW dated 13.12.2011 of P.W.D. Establishment Branch.
- b) Constructional Labour Welfare Cess@1 %( One percent) of the cost of construction will be deducted from every bill of the selected agency. VAT, Royalty & all other Statutory Levy / Cess will have to be borne by the contractor.

As the rates in the Schedule of rate are inclusive of all the taxes & Cess as stated above.

- c) All materials including bitumen (of all grade), bitumen emulsion, cement, steel shall be of **reputed approved brand** in accordance with relevant code of practice and manufacture accordingly and shall be procured and supplied by the agency at their own cost. If required by the Engineer in Charge, further testing from any Government approved Testing laboratory shall have to be conducted by the agency at their own cost.
- d) No Mobilization Advance / Secured Advance will be allowed.
- e) Prospective applicants note carefully the minimum qualification criteria as mentioned in instruction to tenderer before tendering the tenders.
- f) No Conditional Tender will be accepted under any circumstances.
- g) Requirement of Principal Machineries which must be possessed by [Non Statutory Document] by the Tenderer.
- h) Before uploading tender document through e-filing each page of the tender documents are to be signed by the Tenderer having legal authority to do so, failing which the Tenderer will be treated as informal.
- i) The intending Tenderers shall clearly understand that whatever may be the outcome of the present invitation of the Tender, the **TIC, M.G.College, Lalpur**. Reserves the right to accept or reject any / all offer without assigning any reason whatsoever and is not liable for any cost that might have incurred by the Tenderer at the stage of Tendering.
- j) All materials are required to be approved by TIC/Engineer-in-Charge before use.**

**11)** No adjustment of Price or Price Escalation of any kind will be allowed.

**12)** The intending tenderer(s) required to quote the rate (percentage above/below/at par) over the total estimated cost put to tender online considering that no escalation and / or price adjustment will be allowed by the department under any circumstances.

**13)** The Tenderer has to visit and examine the site of works and its surroundings and obtained all information that may be necessary for preparing Tender and entering into an agreement for the work / works as mentioned in the NIT. The costs for visiting the working site shall be at the tenderer own expense.

Prospective Tenderer shall have to execute the work in such manner so that appropriate service level of the Building under improvement is to be maintained during progress of the work and during **Defect Liability Period of 1(one) Year** for Building from the date of successful completion of the work up to the entire satisfaction of the Engineer in Charge. If any defect / damage is detected during this period as mentioned above the contractor shall make the same good at his own expense to the satisfaction of the of the Engineer in Charge or in default the Engineer in Charge may cause the same to be made good by other agency and deduct the cost (of which the certificate of the Engineer in Charge shall be final) from his security deposit or any sums that may be then, or at any time thereafter become due to the contractor. Security Deposit shall become payable only after expiry of the **Defect Liability Period** after making necessary deduction if applicable. Hence condition of refund of Security Deposit as stated in Para 2&3 of Clause No. 17 of WBF 2911(ii) is here by superseded.

- 14) If more than one Tenderer quoted same rate and which are found lowest at the time of opening, such similar multiple rates will not be entertained / accepted. Lowest offer will be ascertained by sealed tender amongst the lowest tenderer.
- 15) At any stage during scrutiny, if it is found that the credential or any other papers which the Tenderer uploaded during Tendering process, found incorrect / manufactured / fabricated, that tender will be considered as non-responsive and out right rejected with forfeiture of Earnest Money and action will be taken as per stipulation of IT Rules in force.
- 16) Before issuance of Letter of Acceptance / Work order, the tender accepting authority may verify the credential & other documents of the lowest tenderer so uploaded online if found necessary. If it is found such document incorrect / manufactured / fabricated, Letter of Acceptance / Work order will not be issued in favour of the tenderer under any circumstances and action will be taken accordingly.
- 17) In case of Ascertaining of Authority at any stage of application or execution of work, necessary registered Power of Attorney is to be produced.
- 18) The Earnest Money may be forfeited if-
- If the Tenderer withdraws the Tender during the period of Tender validity.
  - In case of successful tenderer, if the Tenderer fails to execute formal agreement within the stipulated time period.
  - During scrutiny, if it is come to the notice of tender inviting authority that the credential or any other document which were uploaded & digitally signed by the Tenderer are incorrect / manufactured / fabricated.
- 19) If any discrepancy arises between two similar clauses on different notifications, the clause as stated in later notification will supersede former one in following sequence-
- Printed Tender Form, i.e. W.B.F 2911 (ii)
  - Notice Inviting Tender
  - Special Terms and Conditions
  - Financial Tender

All works covered in the clause appearing hereinafter shall be deemed to form a part of the appropriate item or items of works appearing in the work schedule whether specifically mentioned in any clause or not and the rates quoted shall include all such works unless it is otherwise mentioned that extra payment will be made for particular works.

- 20) For any typographical mistake in case of Unit, Rate, Quantity, Amount, any type of nomenclature in item of works including description etc. whatsoever as stated in documents that cannot be claimed during agreement or so.
- 21) **Permission for sanitary + water supply work has been made as percentage. In actual execution payment for these two works will be made on the basis of actual work done against detailed estimate prepared as per consent PWD SOR for both works at per accepted contractual rate.**

Sd/-

TIC, M.G.College, Lalpur

Memo No.71(9)/MGC/16

Dated: 11.6.2016

Copy forwarded for information and wide circulation to:-

1. DPI,Kolkata
2. DM,Purulia
3. MLA,MANBAZAR
4. SDO - (Sadar/East )
5. Executive Engineer,PWD
6. DIA, Purulia Zilla Parishad for publication in PZP website.
7. DIO, NIC, Purulia for publication in District website.
8. DE,PZP
9. College website & College Notice Board.

**Sd/-**

**TIC, M.G.College, Lalpur**

## SPECIAL TERMS AND CONDITIONS OF TENDER

### SCOPE OF WORK:-

***The work consists of Civil work as set forth in the attached schedule of works according to the following technical specifications together with all other additional works as may be required for the purpose***

- 1) Notwithstanding anything contrary to the conditions laid down in W.B. Form No 2911(ii), the following terms and conditions shall apply for executing of the work under this contract.
- 2) No claim out of typing, printing, arithmetical and/or clerical mistakes anywhere in the tender shall be entertained.
- 3) In case of confusion over any clause/terms/conditions of the tender, the decision of the **TIC, M.G. College, Lalpur, Purulia** shall be final and binding.
- 4) The rates are inclusive of all necessary expenditure to overall incidental factors like location, condition and approachability of the site. No extra claim on any ground of damaged road, unfavorable site condition etc. shall be entertained.
- 5) No escalation of rates within the contract validity period shall be entertained under any circumstances.
- 6) No claim for any idle labour shall be entertained under any circumstances.
- 7) The exact location of the site for execution of the works will be shown and handed over to the tenderer/s by the Engineer-in-Charge or his authorized representative. After completion of the work the site will be taken over by the concerned Assistant Engineer.
- 8) Immediately after taking over the site, the tenderer shall inform the Engineer-in-Charge, in writing, sufficiently in advance about work program relating to the sites handed over to him and keep a competent and qualified representative/s at site and also submit a letter of authority to the Engineer-in-Charge in favour of the stated representative/s attesting his signature in respect of receipt of any departmental materials, signing technical records, measurements and accepting payments. [ Any instruction given to such person by the Engineer-in-Charge or his representative/s shall be deemed to have been given to the contractor.

The contractor(s) shall on being asked by the Engineer-in-Charge or his representative dismiss immediately from the work any person employed by the contractor(s) who may in the opinion of Engineer-in-Charge or his representative is found incompetent or is



quality of misconduct. Access to work at all reasonable time should be reserved for Engineer-in-Charge or his representative.

- 9) The work shall be carried out strictly according to the tendered schedule of work, approved drawing and specification laid down therein under the strict supervision of the Engineer-in-Charge or his authorized representative. No extra or supplementary item of work shall be taken up nor any deviation from scheduled specification or drawing be made without prior written approval of the Engineer-in-Charge. Any deviation or change required in drawing technical grounds are to be approved duly by TIC, M.G.College, Lalpur. The department reserves the right to adjust the design of the foundation during execution at site on the basis of soil condition of the proposed site. In that case execution of some of the items pertaining to the sub-structure portion may not be happened as well as estimated as quantity may be changed.
- 10) The mode of execution of all construction work and mode of measurement shall be as laid down in the current PWD schedule, if not otherwise mentioned in this contract.
- 11) The workmanship and finishing of the work should be of first class and up to the entire satisfaction of the Engineer-in-Charge.
- 12) The tenderer/s shall/will supply necessary labour (skilled and unskilled) as well as proper construction equipments including tools and plants for execution of the work. Engagement of local labours shall be the priority.
- 13) Before starting work at site; where necessary the site must be progressed after cutting cleaning and clearing all verities of trees any girth, jungles and shrubs including up rooting and removing of same and bamboo clusters or any undesirable vegetation within the boundary or alignment for which noting will be not paid extra.
- 14) The tenderer/s shall/will shall maintain a Site Register/Site Order Book having duplicate pages serially machine numbered at site. The Site Order Book shall be authenticated by the Engineer-in-Charge under his signature.
- 15) **ORDER BOOK** :- An order book with duplicate pages having pages including numbered shall maintained by the contractor to record the instructions and directions given at work site from time to time by the Engineer-in-Charge. No supplementary item or claims shall be entertained unless supported by entries in the site order book and by the Engineer-in-Charge with prior approval from the Executive Engineer concerned.

The Department shall not issue normally any cement and / or steel required for work. All construction materials like cement, sand, bricks, stone chips, steel for reinforcement etc. shall have to be supplied by the contractor(s) at his/ her/ their own cost for use in work and shall be of best quality conforming to the requirement of work and upto the full satisfaction of the Engineer-in-Charge. The materials after being brought to the site shall be also stacked properly for approval of the Engineer-in-Charge or his authorized representative(s) and contractor(s) shall/ arrange to take the precaution against any damage due to any reasons and guarding against theft at his/ her their own cost .Rejected materials must be removed by the contractor from the site within 24 hours of the issue of order to that effect. In case of non-compliance of such orders, the Engineer-in-Charge shall have the authority to cause such removal at the cost and expense of the

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contractor(s) and the contractor(s) shall/will not be entitled to any claim or damage on that account.

- 16) Before submission of tender the contractor(s) should verify from the market about the availability of the materials and in no case extension of time will be generally considered on this ground. The Contractor shall arrange for transport including Rly Wagons required for carriage of materials. The department may however grant necessary certificates, if necessary for procurement of Rly. Wagons, but in case of failure of the department to help the contract or in this respect no claim whatsoever as regard cost, shall be entertained.

All materials tools and plants (except those to be supplied by the Deptt.) labour corporation for water supply, Royalty of buildings materials (if any). Electricity restoration charges and other loading and unloading, holding charges etc. shall have to be borne by the contractor at his own cost inclusive of sales tax and all other charges for their execution of the complete or furnished work or in case of supply of materials and for carriage to the entire satisfaction of Engineer-in-Charge of the work. Before starting work at site; where necessary the site must be progressed after cutting cleaning and clearing all verities of trees any girth, jungles and shrubs including uprooting and removing of same and bamboo clusters or any undesirable vegetation within the boundary.

- 17) Details of machineries/ Tools & Plants available with the tenderer(s) for use in the work and information required to support his /her/their available capacity to complete the work are as (a) Cement mixer (b) Concrete vibrator, (c) Generator with lighting arrangement, (d) Pump set with raising arrangement.

- 18) Immediately after taking the layout of the work, the contractor shall submit indent of departmental materials, if any, to be issued for the works, to the Engineer-in-Charge. The contractor shall check all departmental materials issued to him from the departmental store before transporting those to the work site at his own cost. No complain about defects/shortage of departmental materials shall be entertained after those have been transported to site. The contractor shall have to arrange proper storing of these departmental materials at site up to full satisfaction of the Engineer-in-Charge and the Engineer-in-Charge or his authorized representative shall be provided access to the site store at all times for checking. In case of damage or loss of any departmental materials from site due to any reason or theft etc. the cost of the same shall be recovered from the bill of the contractor at double with issue rate.

- 19) Fencing required, if any for any purpose, cost thereof one contractor's own obligation. Except when specifically mentioned in the description of the item itself, the rate for any item of work will apply equally to all floors, and any position and upto any height. In respect of concrete work etc. where the rate is on the basis of volume, the item shall apply to all cases, irrespective of the thickness, unless a specific item appears in the schedule for the particular type of work.

- 20) All MS fittings like valves, bends etc. shall be jammed properly so as to make the joints completely leak proof.

- 21) Before application of rate, quantities of all items with materials units must be calculated with correction to 2 places of decimal when the rate is upto Rs.100.00 (Rupees One

undred) and 3 places of decimal when the rate is above Rs.100.00 (Rupees One Hundred).

- 22) After completion of the work excess materials, if any, supplied departmentally shall be returned to the departmental stores in good & acceptable condition at free of cost. Otherwise, cost of unreturned excess departmental materials shall be recovered from the contractor's bill. In case of any loss or damage of the departmental materials issued to the contractor, the value thereof shall be recovered from the contractor's bill at double with issue rate.

**Work during night or on Sunday and holidays :**

Unless otherwise provided, none of the permanent works shall be carried out during night, Sundays or authorized holidays without the permission in writing. However, when work is unavoidable or necessary for the safety of life, property or works, the contractor shall take necessary action immediately and advise the Engineer-in-Charge accordingly.

- 23) On successful completion of work, final payment will be made after deducting requisite security money & Cess.

**Contractor dying, becoming, insolvent, insane or imprisoned :**

In the event of the death or insanity of the contractor the contract may be terminated by notice in writing, pasted at the site and advertised in one issue of the local newspaper. All acceptable works shall thereafter, be paid at appropriate rates after recovering all the contractor's dues to Government to the person entitled to receive and give a discharge for such payment.

- 24) Any defect arising during the security period regarding construction will have to be rectified by the contractor/s at his/her/their own cost. The Contractor shall be responsible to make good within such period, may be stipulated by the Engineer-in-Charge, any defect which may develop or may be noticed before the expiry of six months from the certified date of completion and which is attributable to the contractor. All notice of such defect shall be given to the Contractor promptly. In case the contractor fails to make good the defects, the Engineer-in-Charge may employ other persons to make good such defects, and all expenses consequent thereof and incidental thereto shall be borne by the contractor.

In the event Government takes over portions of work as they are completed the liability of contractor under this clause for those portions shall extend to a period of six months from the actual dates on which portions of works are taken over.

- 25) Payment will be done to the Contractor as per availability of fund.

**Sd/-**

**TIC, M.G.College, Lalpur**

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## TECHNICAL SPECIFICATIONS

AGAINST NIT No.  
TIC, M.G.College, Lalpur

### **SCOPE OF WORK:-**

*The work consists of Civil work as set forth in the attached schedule of works according to the following technical specifications together with all other additional works as may be required for the purpose.*

### **A. MATERIALS**

#### **GENERAL:**

All materials to be used in works shall conform to Indian Standards Specification as published by I.S.I. from time to time (and in the absence thereof as approved by the Engineer-in-Charge).

#### **A-1) BRICKS:**

All bricks shall be of approved quality of standard specification, made of good brick earth uniform deep made cherry or copper colour, thoroughly burnt in kiln (machine made) without being verified regular in shape and size, sound, hard homogeneous in texture, true to shape and standard dimension and shall be free from cracks, chips flaws, stones or humps of any kind and shall not show appreciable signs of efflorescence either after soaking of one day or subsequent to soaking in water. The size of bricks shall be  $9\frac{3}{4}'' \times 4\frac{1}{4}'' \times 2\frac{3}{4}''$  (conventional) or 200 x 100 x 100 mm. (modular). The bricks shall emit a clear ringing sound on being struck and have a minimum crushing strength of 105 Kg / sq.cm. All the bricks which absorbs water more than 20% their own dry weight after 24 hours immersed in cold water shall be rejected.

#### **A-2) COARSE AGGREGATES FOR CEMENT CONCRETE WORKS:**

(i) Stone chips or stone ballast for cement concrete (plain or reinforced) shall be hard of uniform and fine texture, free from faults of planes of weakness and free from weathered forces. The ballast or chips must be free from loan clay or any surface coating, free from organic matter or other impurities and screened free of dust. Stone of black and hard variety as is generally available from quarries in Pakur or Chandil areas will be normally used. Stone aggregates from other sources may also be used provided the same is found suitable in the opinion of the Engineer-in-Charge. The opinion of Engineer-in-Charge must be recorded in writing. The ballast or chips shall be obtained by breaking from large blocks and must be more or less cubical in shape.

#### **Size of Coarse Aggregates:**

For any of the following nominal sizes of graded course aggregates grinding shall be in conformity with the requirements laid down in Indian Standard Specification I.S. 383 – 1963. When coarse aggregates brought to the site is upgraded, single size coarse aggregates of different nominal size, conforming to the requirement shall be mixed at site with the other ingredients of concrete either directly in the mixture or on the platform.

ii) Gravel when permitted for use as coarse aggregates in cement concrete work, must be hard absolutely free from surface coating and on being broken, the fractured surface must indicate a uniform and fine texture free from laminations or planes of weakness. It shall be thoroughly washed and free from any foreign elements.

All coarse aggregate for concrete works must be well graded. These shall be screamed for removal of dust, and if so necessary in the opinion of the Engineer-in-Charge shall be washed at the cost and expense of the contractor(s).

#### **A-3) SAND:**

All sand shall be sharp and free from clay, loam, organic or any other foreign matter and the same shall be obtained from approved source. The contractor shall get the sample of sand be used in different kinds of work approved by the Engineer-in-Charge before using the same in work. Sand which in the opinion of the Engineer-in-Charge or his representative is dirty, must be washed to his satisfaction at the cost and expense of the contractor(s).

i) Sand for all cement concrete work must be coarse. The sand shall pass through a mesh 4.75mm. square measured in the clear. Sand shall not be used for concrete works if contains more than 10% of the fine grains passing through a 76 mesh sieve as used for cement test, nor should the finest modules be less than 2.00 unless specific permission is obtained from the Engineer-in-Charge.

ii) Medium / sand may be used for cement mortar for masonry, plaster etc. fineness and also for bituminous works of road. Fineness modulus shall be between 2 to 1.8.

iii) Sand filling in plinth or foundation, where specified may be done with fine sand.

#### **A-4) SURKI:**

Surki shall be made from well burnt 1<sup>st</sup> class brick bats ground to pass through a mesh 1.5 mm each way and shall be perfect clean and free any foreign matter.

#### **A-5) LIME:**

All lime shall be freshly burnt and slaked and screened before use. The slaking should be done at work site. Lime for works including roof terracing shall be Bisra, Satna or other approved stone lime as per the direction of the Engineer-in-charge. The specification covers lime as used in construction of buildings and other structures as described below [Refer PWD standard specifications chapter (II)].

(a) Quick Lime shall mean a calcined materials, the major part of which is Calcium Oxide in natural association with a relatively small amount of Magnesium Oxide in natural association and capable of slaking with water.

(b) Fat-Lime shall mean the Lime, which has high Calcium Oxide content (between 95 and 100 percent) and is dependent for setting and hardening on the absorption of carbon dioxide from the atmosphere.

(c) Hydraulic Lime shall mean the lime which contains small quantities of silica and alumina and / or iron oxide which are in chemical combination.

(d) With some of the calcium oxide content, giving a supply or mortar that has the properly of setting and hardening under water.

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- (e) Hydrated lime shall mean a dry powder resulting from treatment of quick lime with water enough to satisfy its chemical affinity for water under the conditions of hydration.

**Classification of lime:-**

**Class A:** Eminently hydraulic lime (containing 25 to 30% of clay) use for foundations and hydraulic structures and shall be supplied as hydraulic structures and shall be supplied as hydrated lime only)

**Class B:** Semi-Hydraulic Limes (containing 15 to 20% of clay) use for mortar for masonry work.

**Class C:** Fat lime used mainly for lime punning, white washing and suitable admixture, such as surki or any other puzzulanic materials to produce artificial hydraulic mortar.

**A-6) CEMENTS:**

No cement excepting these approved by the Document shall be used in work or brought to the site by contractor. Cement in bags must be stored in a water tight shed having wooden floor or platform raised at least 45cm from ground as approved by the Engineer-in-Charge. Cement which is partially set or which is in lump condition is to be treated as damaged and shall be removed from site immediately.

**A-7) STEEL:**

All steel shall be clean and free from loose mill scales, dust, loose rust and coats of paints, oil or other coatings. Any scale or loose rust shall be removed before use without any claim for extra charge for the same. No steel excepting those approved by the Department shall be used in work or brought to site by the contractor(s).

M.S.(except reinforcements) or W.I. works (even if fabricated with Departmental materials) are taken to include one coat of priming.

**A-8) TIMBER:**

All timber shall be of best quality, well-seasoned and / or well treated for preservation and protection against decay etc. It shall be uniform in substance, straight in fiber, free from large or deep knots, sap, flaws, sun-cracks, shakes or blemished of any kind. Any insect damage or splits across timber shall throughout be uniform, firm and shining with a silky lustres when planed and shall not emit full sound when struck.

**A-9) GLASS:**

All glasses shall be of the specified type, colour visibility and kind and shall be free from cracks, flaws specks bubbles and blemishes and shall not weight less than 7.4 Kg / sq.m. unless otherwise specified.

**A-10) TIMBER DOORS, WINDOWS ETC. AND THEIR FITTINGS:**

- i) Door and window works shall be carried out as per detailed drawings or as directed by the Engineer-in-Charge. Specified timber shall be used and it shall be sawn in the direction of the grains and be straight and square.
  - ii) Fittings shall be of iron, brass, aluminum or as specified. These shall be made reasonable smooth and free from sharp edges, corners, flaws and other defects. Screw holes shall be
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counter sunk to set the head of specified wood screws. Iron fittings shall be finished bright or black enameled or copper oxidized.

Brass fittings shall be finished Bright (brass) oxidized or chromium plated (Electro plated) and aluminum fittings shall be finished bright or anodized or as specified. Fittings shall be bit sponsored by the Engineer –in- Charge before fixing. In case of renewal works, the new fittings shall be as far as possible match with the existing ones. Screws shall be driven home with screw driver and not hammered in.

**iii) Size of fittings :** The size of the fittings shall be reckoned by the dimension as noted below :-

- 1) **Butt hinges:** Length x width when open.
- 2) **Parliamentary hinges:** Height of flange x width of races ( open space between the flanges)
- 3) **Tee hinges:** Length of the leaf (i.e. from the knuckles to the point)
- 4) **Strap hinges:** Length of one flap from the center of knuckles.
- 5) **Double acting hinges:** Length of the sprint cylinder.
- 6) **Tower bolt:** Length of the bolt.
- 7) **Barrel bolt:** Length of the bolt.
- 8) **Skeleton bolt:** Length of the bolt.
- 9) **Hask bolt:** Length of the bolt.
- 10) **Catch heek:** Length of the bolt.
- 11) **Door and window rind:** Internal diameter of the ring.
- 12) **Door and window handle:** Grip length.
- 13) **Helical spring:** Length from the center of barrel to the center of wheel.
- 14) **Hasp and staple:** Length from the center of the hinge to the end excluding the hinge.

#### **A-11) PAINT etc:**

All paints shall be delivered in strong containers market with the colour of the paint, brand, volume paint content in liters and of the best quality of approved make and brand as approved by the Engineer-in-Charge. Under no circumstances shall paint be diluted with linseed oil or otherwise. Any paint or enameled although of approved brand, which so hardens in the container that it cannot be readily broken up with a stirrer to a smooth uniform painting consistency, shall be rejected. The approved brand of Synthetic Enamel, Acrylic Emulsion, Distempers, Ready mixed oil bound paint are given in the chart below.

#### **APPROVED BRANDS OF DIFFERENT TYPES OF PAINTED ETC**

SI	Description	Shalimar Paints Ltd	Jenson & Nickolson	Asion Paints	Killx Nixi
1	2	3	4	5	6
1 a)	1 <sup>st</sup> quality Synthetic Enamel (IS 2932) (Hi-gloss)	Superlac synthetic.	Brolac	Apcolite synthetic enamel.	--
	2 <sup>nd</sup> quality –do-do (normal gloss)	Durolac synthetic enamel.	Jensoline quick drying synthetic enamel.	3 Mangoes synthetic enamel	--
2 a)	Wall paint dry distemper.	--	--	Tractor oil bound.	--
b)	Oil bound distemper	Durodal.	Rebialac	--	--
c)	Plastic paint.	Superlac.	Acrylic Emulsion.	Apcolitic (Plastic)	--
3	Primer for wood and steel.	Shalimar Pink / Grey wood primer.	Jensoline Pink / Grey Wood Primer.	--	--

5	Cement Base.	Cemkote	Robia Cem	--	Super snowcem
6	Readymade oil bound paint.	Wood kote steel kote. (club brand)	--	--	--

## **B. EXECUTION**

### **GENERAL:**

All works shall be carried out in proper workman – like manner. Items of works not covered by the following shall be carried out as per best practice according to the directions of the Engineer-in -Charge and to his satisfaction unless otherwise specified in this section or in the description of item. The cost of all stages of works mentioned hereunder shall be deemed to have been included in the rates of items provided in the Schedule.

### **EARTH WORK:**

The work consist of excavation of earth from areas fixed up by the Engineer-in-charge to depth as per drawing and depositing the earth in layers of 150 mm thick to make the bed and bank of the water body /canal or otherwise. The borrow area shall be cleaned of vegetation growth stripping to depth of 30 cms or so as per requirement. Any excavation carried beyond the specified line and levels shall be back filled by the tenderer with earth in layers at his own cost. Workable slopes shall be allowed in excavation as approved by the Engineer-in-Charge . During the progress of work it may be necessary to vary the slopes or change dimension of any portion of the drawing. The tenderer(s) shall/will not be allowed for any change from his/her/their own.. Any loss of earth due to wave wash, rains, flood or any other natural calamities will have to be made good by the tenderer at his/her/their own expenses. No extra payment shall be admissible on this/these accounts. The rate of excavation shall include the cost of cutting and removal of bushy jungle, roots of trees and stumps of all trees up to 0.30 meter girth from the site of work as directed.

Measurement of earth work will be taken by section measurement and or pit measurement irrespective of size of embankment and cutting exclusively based on pre and post work levels as decided by the Engineer-in-Charge Deduction for voids in sectional measurement of finished embankments will be made as per standard rules, depending upon the date of measurement.

### **Excavation of foundation filling up trenches:**

- i) Foundation when excavated up to the level shown in the drawing will be shown to the Engineer-in-Charge or his authorized representatives and if on account of bad ground or for any reason whatsoever he shall decide to go deeper with the foundation and then the contractor shall excavate further to the depth of required by the Engineer-in-Charge. In no case shall be foundation soling or concrete be laid prior to receiving orders to that effect from the Engineer-in-Charge or his authorized representative.
- ii) Excavation shall include throwing the excavated earth at least one meter or half the depth of excavation, whichever is more, clear of the edge.
- iii) The excavated areas around the foundation of structures are to be filled up properly to the required level with earth obtained from excavation or other materials as directed, well



rammed with water and consolidated in layers not exceeding 15 cm. at a time. The quantity for this item of work will be measured on the basis of quantity of excavation paid for less the volume occupied by the structure in foundation.

**Cement concretes works (plain or reinforced):**

**(i) Shutter and Staging:** Wherever necessary shuttering and staging must be provided. Unless otherwise stated no payment will be made for such shuttering or staging and the cost thereof will be deemed to have been covered by the rate for relevant finished item of work. Where payment for shuttering has been specified, the rate shall be deemed to cover the cost of the necessary staging as well. Payment if any for shuttering will be on the basis of surface area of shuttering in actual contract with concrete.

**(ii)** Shuttering may be of approved dressed timber true to line, not less than 2.5 cm thick. Surface to be contact with concrete are to be planned smooth except where otherwise stated. As an alternative, sufficiently rigid steel shuttering may be used. In every case, joints of the shuttering are to be such as to prevent the loss of liquid from concrete. In timber shuttering the joints shall therefore be either tongued and grooved or the joints must be perfectly closed and lined with craft paper or other types of approved materials. In case of steel shuttering also the joints are to be similarly lined. All shuttering and framing must adequately be stayed and braced to the satisfaction of the Engineer-in-Charge for properly supporting the concrete during the period of hardening. It shall be so constructed that it may be removed without shock or vibration to the concrete.

Before the concrete is placed, the shuttering shall, if necessary, be coated with as approved preparation for preventing the adhesion of the concrete to the moulds, and it is to be of such nature and so applied that the surface of the finished concrete is not stained. Care shall also be taken that such approved preparation shall be kept out of contact with reinforcement.

In no circumstances shall form be struck until the concrete reaches strength of at least twice the stress of which the concrete may be subjected as the time of striking. Interior of all moulds and boxes must be thoroughly washed out with a hose pipe or otherwise sq. as to be perfectly clean and free from all extraneous matter previously to the deposition of concrete.

All form work shall be removed without shock or vibration. Before the form work is stripped the concrete surface shall be exposed where necessary in order to ascertain that the concrete has hardened sufficiently. In normal weather and with ordinary cement vertical or side shuttering may be removed after three days and the bottom shuttering of horizontal members after fourteen days in case of slabs and twenty one days in case of beam and cantilevers etc. from the date of placing the last portion of the concrete in the structure.

The above period is the minimum and may be extended if founded necessary. Before stripping off the shuttering of structural member the contractor shall take pervious permission of the Engineer-in-Charge or his authorized representative.

No plugs, bolts, ties, hold fasts or any other appliances whereas for the purpose of supporting the shuttering are to be fixed in the structure of place in such a way that damaged might result to the work in removing the same when the shuttering is struck.

**(iii) Scaffolding:** The Scaffolding must be standing and rigid stiffened with necessary cross bears and always decked and bear on the site with close boarded calling and swings to prevent

and injury to persons or materials. The contractor shall have to allow other trades to make reasonable use of his scaffolding and has directed by the Engineer-in-Charge if for the interest of the work the contractors have to erect scaffolding in the others properties including local bodies or corporation, the arrangement for the name including local bodies or corporation, the arrangement for the name including the cost of licensing fees etc. shall have to be borne by the contractor and department should be kept free from any liabilities on this/these account.

**(iv) Mixing, Placing And Compacting:** The proportion specified is by volume in dry rodded condition to the different constituents. Boxes of suitable size measuring 350 x 400 mm shall be used for measuring sand and aggregate. The unit of measurement for cement shall be a bag of cement weighting 80 Kg and this shall be taken as (0.0335 cubic meter). While measuring the aggregate, shaking, ramming or hampering shall not be done. The aggregate in each batch of concrete are to be so proportioned as to contain full bags of cement. The proportionate of sand shall be on the basis of its dry volume and in case of damp-sand allowances for bulking be made.

Normally all structural concrete shall be machine mixed of appropriate proportion and shall have to be vibrate with suitable vibrator. Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency, but in no case shall the mixing be done for less than two minutes. The rates appearing in Schedule of Rates against such items are inclusive of hire and operational charges of such appliance. For particular job the Engineer-in-Charge may allow hand mixing and/ or hand tapping of concrete. In case of hand mixing concrete, extra cement upto 10% over the standard requirement of cement in lieu of machine mix of particular mix shall have to be provided by the contractor at his own cost.

As the bulking of sand may vary from day to day and at different part of the day on account of varying moisture content, frequent tests for bulking shall be carried out with the sand to be used and the amount of bulking allowed for the field mix so as to keep the actual proportion constant throughout.

Only such quantities as are regarding for immediate use are to mixed at any one time. Sufficient water is to be added to obtained proper workability so that the mixture may flow readily round the reinforcement and into part of the moulds. The workability shall be measured by the amount of slump.

The quantity of water to be used for each mix of 50 Kg cement to give the required consistency shall be as per table indicated here after. In the case of vibrated concrete, the limit specified may suitably reduced to avoid segregation.

The total water content in each batch of concrete shall always be kept constant as the amount previously determined by experiments. The quantity of water to be actually added may, therefore, vary depending on the moisture content in the aggregate. In actual job if the quantities of the ingredients remain constant the amount of slump may be taken as guide indicating the total water content of the concrete shall therefore be kept constant and check from time to time as work proceeds by means of standard slump test.

The **slump test** shall carried out with concrete immediately after it has been mixed and before any initial set has commenced, the sample being taken preferable at the point where the concrete is being delivered for placing in the moulds.

The mould shall be filled about the one fourth of its height with concrete which shall then be tamped, using 25 strokes of a 16 mm diameter steel rod, 60 cm. Long and bullet-pointed at the

lower end. The filling, shall be completed in successive layer similar to the first and the top struck off so that mould is exactly filled.

The mould shall then be moved by raising vertically immediately after filling. The moulded concrete shall then be allowed to subside and the height of the specimen measured after coming or reast.

The consistency shall be recorded in terms of millimeters of subsistence of the specimen during the test, which is known as slump.

**The following slump shall be adopted for different works:**

Sl. No.	Type of works	When vibrators are used.	When vibrators are not used.
1	2	3	4
1	Mass concrete in foundations, footings, retaining walls and pavements.	10 to 25 mm	50 to 75 mm
2	Mass concrete in R.C.C. foundation, footings and retaining walls.	10 to 25 mm	80 mm
3	Beams, slabs and columns.	25 to 40 mm	100 to 125 mm
4	Thin R.C.C. section or sections with congested steel.	40 to 50 mm	125 to 150 mm

**Table for Proportions for Nominal Mix Concrete as per I.S. (Code No. Is 456-2000)**

Grade of Concrete	Total quantity of dry aggregates by mass per 50 kg. of cement, to be taken as the sum of the Individual masses of fine and coarse aggregates (max)	Proportion of fine aggregate to coarse aggregate (By mass)	Quantity of water per 50 kg. of cement (max).
1	2	3	4
M5	800	Generally 1:2 but subject to and upper limit of 1:1½ and lower Limit of 1:2½.	60
M 7.5	625		45
M 10	480		34
M 15	330		32
M 20	250		30

**Note:** The proportions of the fine and coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregates becomes fine and the maximum size of coarse aggregates becomes larger. Graded coarse aggregates shall be used.

**Example:** For an average grading of the fine aggregate as per I.S.: 383, the proportions shall be 1:11/2, 1:2 or 1: 21/2 for maximum size of aggregates 10 mm., 20 mm and 40 mm. respectively.

**(v) Protection and Curing:** The contractor shall adequately protect freshly laid concrete, about 1 to 2 hours after its laying from too rapid drying due to sunshine, drying winds etc. and also from running of surface water and shocks. About 24 hours of laying of concrete the surface shall be cured by flooding with water of minimum 25mm. depth or by covering with wet absorbent materials. The curing shall be done for a minimum period of 10 days. Over the foundation concrete the masonry work may be started after 48 hours of its laying but the curing of cement concrete shall be continued along with the masonry work for a minimum period of 10 days. In case of cement concrete using as sub-grade for flooring, the flooring may be commenced within 48 hours of the laying of sub-grade. In case it is not possible to do so due to exigencies of work the sub-grade shall be roughened with steel wire brushes without disturbing the concrete wetted and neat cement slurry at the rate of 2.75 Kg. of cement per square meter applied to the base before laying floor, and will be paid separately with express orders of the Engineer-in-Charge. The curing to be continued along with the top layer the flooring for a minimum period of 10 days.

**(vi) Construction Joints:** All joints in slabs and other horizontal members are to be formed by inserting vertical boards against which the concrete deposited can be properly rammed. The positions where such joints may be made will be indicated by the Engineer-in-Charge or his representative.

In the case of horizontal joint any excess mortar or Laitance shall be removed from the surface after the concrete is deposited and before it has set.

When the work has to be commenced on a surface which has hardened such surface shall be well roughened and all laitance removing surface shall then be swept clean thoroughly wetted and cover with a thin layer of mortar composed of equal volume of cement and sand. Such works shall be held to be covered by the rates for concrete.

**(vii)** For major R.C.C. works concrete should so specified by strength. The mix for the concrete is to be adopted and the slump is to be so allowed as to give specified strength and proper workability at the existing site conditions. Contractor shall remain fully responsible for producing **concrete cube test** with specified strength in the actual job and the cost thereof shall have to be borne by the contractor. Each set of test specimen shall be taken to cover the quantity of concrete laid the job during the period from the time of taking the previous set of specimens and the quantity will be estimated by the Engineer-in-charge from records maintained by him. The interior surface of the mould and base plane shall be laid lightly oiled before the concrete is placed in the mould.

When the job concrete is placed by vibration and the consistency of the concrete is such that the test specimens cannot be properly moulded by hand rodding as described under (a) above, the specimen shall be vibrated to give a compaction corresponding to that of job concrete. The fresh concrete shall be placed in the mould in two layers, each approximately half the volume of the mould. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it in order to ensure a symmetrical distribution of concrete within the mould. Either internal or external vibrators may be used. The vibration of each layer shall not be continued longer than it is necessary to secure the required density. Internal vibrators shall be of appropriate size and shall penetrate only the layer to be compacted. In compaction of the first layer, the vibrators shall not be allowed to rest on the bottom of the mould. In placing the concrete for the top layer, the mould shall be filled to the extent that there will be mortar loss during vibration. After vibrating the second layer, enough concrete shall be added to bring the level above the top of the mould. The surface of the concrete shall be struck off with a trowel and covered with a glass or steel plate as specified. The

whole of process of moulding shall be carried out in such a manner as to preclude the alteration of water cement ratio of the concrete by loss of water either by leakage from the bottom or overflow from the top of the mould. After de- shuttering of concrete test cube, those test cubes should be placed at actual place of concrete job for curing. After curing the specimen properly wrapped shall be made over to the Engineer – in –charge or his representative who will arrange to have them tested after 28 days from the date of casting. If there be any delay for any reason whatsoever the result of that test shall never the less valid and will be applicable as per rules in each case for all test specimens whatsoever the contractor shall be responsible for proper packing of the Specimens at his own cost, for safe and convenient transport of the same from the site to the testing laboratory.

Out of four specimen in each set, the Engineer –in-charge will arrange to have any two tested departmentally at the Departmental Test House and in case of deficiency in strength, send the remaining two for test by the Government Test House at Alipore, whose report shall be binding on all parties concerned. The test result obtained from the Government Test House at Alipore shall be considered satisfactory if:

(a)The strength of each individual specimen is at least ninety percent of the specifying strength and (b) the average of the result of the two specimens is not below the specified both conditions being fulfilled. For the purpose of operating this clause the results of the two specimens shall be taken as strength of concrete and the percentage of deficiency calculated accordingly. If however, the test result be unsatisfactory from the point of view of condition (a) above but the average the results of two specimens be not less than the specified strength of the deficiency in strength shall be taken as not exceeded five percent. The cost of testing the test moulds and other charges including cost of carriage of the test moulds from the work site to the particular laboratory (both ways) and other incidental charges in this connection will have to be borne by the contractor(s).

In the case of the concrete showing on the result of the tests, strength less than those specified, the quantity in cubic meter certified by the Engineer –in-charge as to deficient may be allowed to remain subject in such a case, to a deduction for such sum as are or may become due under the contract not exceeding Rs.20.00 per cu.m. of the quantity so certified in case where deficiency does not exceed five percent and Rs.40.00 per cu.m. of the said quantity where the deficiency exceeds five percent. The Engineer-in-charge shall have full power in his absolute discretion to fix the actual rate of deduction subject, only to that the rate so fixed shall not exceed the maximum as provided above. If the deficiency exceeds ten percent the Engineer-in-charge may, as his discretion direct the portion of concrete certified by him as so deficient in strength to be removed from the structure and replaced by concrete of specified strength and the contractor shall in this case, have to carry out that direction at his own cost irrespective of the amount of loss inconvenience and difficulties involved. The contract shall remain liable under the provisions of this clause notwithstanding issuing by the Engineer –in-charge of any certificate or the passing of any bills or accounts. A proper register of test specimens shall be maintained at site of work showing all relevant details. The surface of the specimens must not be spoiled by identification marks. These marks may at first be made on the moulds and painted on the open surface as soon as these are taken out from the moulds. After curing and making the specimens property wrapped in bags and/or crated shall be made over to the Engineer-in-Charge or his representative who will arrange to have them tested at 28 days from the date of casting. If there be any delay for any reason whatsoever the fault of that test shall never the less be valid and will be applicable as per rules in which cases considering age factor.

## **BRICK WORKS:**

Cement mortar shall be prepared by mixing sand and cement in specified proportion. Sand shall be measured the basis of its dry volume. In case of damp sand, its quantity shall be increased suitable to allow for bulking. Sand, lime and surki for mortar shall be measured by volume in properly constructed boxes and cement by bag at 0.0335 cum. per 50 kg. bag.

Brick work shall be laid in English bond. The brick shall be laid by layering method. A layer of mortar shall be spread on full width for suitable length of the lower courses each brick and shall be laid so as to project over the one below, both at the end and as the side, then pressed into the mortar and shoved into final position so as to embed the brick and to fill its inside face fully with mortar. Cuts brick shall not be used except where necessary. The walls shall be taken up truly plumb bob. The thickness of brick courses shall be kept uniform and for this purpose, wooden straight edge with gradations giving thickness of each brick course including joints shall be use. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. Vertical joints in alternate course shall come directly one over the other. A set of tools comprising of wooden straight edge, Masons spirit level, square, half meter rule, line and pins, string and plumb shall be kept for every 3 masons for frequent checking during progress of work. Faces of walls found not in plumb shall be dismantled. Both the faces of walls of thickness greater than 25 cm. (10") shall be kept in proper plane. All the connected brick shall be carried in nearly at one level and no portion of the work shall left more than 1m. below the rest of the work. Where this is not possible, the work shall be raked according to bond (and not left toothed) at an angle, not steeper than 45°.

Brick shall be so laid that all joints are quite full of mortar. The thickness of joints shall not exceed 10mm. Bricks shall be laid with from upward except in the top course where frog shall be placed down ward. The face joints shall be raked to a minimum depth of 15 mm. by raking tools daily during the progress of work when the mortar is steel green, so as to provide proper key for plaster or pointing to be done. Where plastering or pointing is not required to be done the joints shall be struck and finished at the time of laying.

The face of brick work shall be cleaned the very day that brick work is laid daily and all mortar droppings removed.

Green work shall be protected from rain by suitable covering. The brick shall be kept wet for a period of at least 7 days. The top of masonry work shall be left flooded at the close of the day. Scaffolding shall be sound and strong and holes left in masonry work for supporting the scaffolding shall be filled and made good before plaster.

## **DAMP PROOF COURSE:**

This shall be laid to a specified thickness over walls for the full thickness of the super structure walls. The surface shall be leveled and prepared before laying the cement concrete. Edges of damp proof course shall be straight, even and vertical. Side shuttering shall consist of wooden forms and shall be strong and properly fixed so that it does not get disturbed during compaction and the mortar does not leak through. The concrete mix shall be of workable consistency and shall be tamped thoroughly to make a dense mass. When the sides are removed, the surface should come out smooth without any honey-combing. The damp proof course shall be laid continuous and the surface shall be double chequered. Damp proof course shall be curing for at least seven days after which it shall be allowed to dry. Water proofing materials of approved quality shall be added to the concrete mixture in accordance with the manufacture's specifications stirring the quantity on water proofing materials in liters or kg. Per 50 kg. of cement and will be paid for separately.

### **CEMENT PLASTER:**

The proportion for mortar for exterior or interior plaster shall be specified in items of work. The plaster shall be a thickness as specified and the surface shall be similarly cured as on cement concrete. The moulding shall be carried out as shown in the drawing and shall be separately measured in overall length unless otherwise specified in the items. Interior corners and edge of openings if so directed by the Engineer –in-charge shall be rounded off or chamfered with the same mortar for which no extra payment will be allowed. All cement concrete surface should be chipped off properly before taking up the plastering work.

### **ARTIFICIAL STONE FLOORING:**

The artificial stone flooring shall laid in panels of shape and size as directed. The casting of the panels will be so programmed as to prevent bonding on the freshly laid panel with adjacent panels.

Unless otherwise specified, the underlay shall be with graded stone chips 12 mm. down, the topping shall be of 10 mm. thick and colouring pigment as may be required shall only be added with topping. The topping and underlay shall not be laid in one operation. After lying the 'underlay' the surface shall be left out to dry. The topping shall be laid only after the underlay has sufficiently dried and initially set and after thorough brushing with hard wire brush and sweeping clean and after application on slurry. The topping shall be finished with an English trowel and a piece of clean dry linen. During all the stages, the required level shall be carefully observed and maintained. Suitable grinding where required shall be provided in the flooring for water drainage as directed by the Engineer –in-Charge. The corner between floor and wall shall be rounded off as directed by the Engineer-in-Charge for which no separate payment shall be made. All cement concrete surface should be chipped off properly before taking up flooring work.

### **RAIN WATER PIPES:**

The rain water pipes shall be of the materials and of the size as specified . All rain water pipes shall have suitable grating as directed at the inlet openings at roof and shall be fitted and fixed in proper position with necessary off sets, clamps, shoes, Y-junctions and other accessories as required and as directed by the Engineer-in-charge. The pipes are to be fixed to walls in cement mortar (1:4) with necessary clamps and nails suitable teak wood blocks being fixed on the walls to receive the nails, Y-junction shall be used at the top of pipe and the vertical. leg thereof shall be provided with a cowl. All joints shall properly packed. In case the hole is made larger than the side of the pipe cement concrete (1:2:4) shall be used to fill the annular space. The pipes with fittings etc. are to be painted with 2 coats of approved paint.

### **WHITE WASHING AND COLOUR WASHING:**

Preparation Of Surface : All surfaces for white washing, color washing, painting shall be roughly brushed, free from mortar droppings and foreign mater and prepared to the satisfaction of the Engineer-in- Charge, before application of the treatment. Before white washing all the nails etc. have to be removed the walls and all nails or other holes , small depressions of damages in plaster or wall surface shall be filled or repaired original condition with lime paste.

Old surfaces spoiled by smoke and greasy soots shall be sprinkle with surki and water and rubbed with brick bats or steel wire brushes or steel scrappers. The surface shall then be boomed to remove all dust and shall be washed with clean water.

(A): White wash and colour wash:

Preparation Of White Wash: The white washing is to be done in 5 parts stone lime and one part of shell lime with necessary gum (2 Kg. Per cum. of lime) using indigo as necessary and to be mixed as per standard practice.

Preparation Of Colour Wash :- Colour washing shall have a prime of white wash and shall be of shade as approved by the Engineer -in- Charge.

Sufficient quantity of colour wash enough for complete job shall be prepared in one operation to avoid any difference in shade.

Procedure and preparation of surface shall be the same as the white washing. The operation for each coat shall consist of four consecutive stroke of the brush one horizontally from right to left and the next left to right and the third stroke bottom to upward and the four from top to downward before the previous stroke dries. Each coat shall be allowed to dry before the next coat applied. No portion of the surface shall be left out initially to be patched up later on. The brush shall be dipped in white wash or colour washed pressed lightly against the wall of the container, and then applied by lightly pressing against the surface with full swing of band.

The white wash on ceiling should be done prior to that on walls.

Protective Measures: Surface of doors, windows, floors, articles of furniture beams burghas etc. and such other parts of the building not to be white or colour washed shall be protected from being splashed upon. Such surface shall be cleaned or white or colour was splashed if any.

### **DRY DISTEMPERING:**

Dry distemper of approved brand and manufacture shall be used. The shade shall be got approved from the Engineer-in-charge before application of the distemper.

The dry distemper shall be stirred slowly in clean water using 6 deci liters (0.6 litre) of water per kg. of distemper or as specified by the makers. Warm water shall preferably be used. It shall be allowed to stand for at least 3 minutes (or if practicable over night) before use. The mixture shall be well stirred before and during use to maintain even consistency. Distemper shall not be mixed in larger quantity than is actually required for one days' work.

Before new work is distempered, the surface shall be thoroughly brushed be free from mortar droppings and other foreign matter and sand papered smooth. New plaster surfaces shall be allowed to dry for at least two months, before applying distemper. In the case of old work, all loose pieces and scales shall be removed by sand paper. The surface shall be cleaned of all grease, dirt etc. pitting in plaster shall be made good with plaster of Paris mixed with dry distemper of the colour to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth a coat of the distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is applied. The priming coat of spiting shall be applied and no white washing coat shall be used as priming coat for distemper.

Whiting (grind white chalk) shall be dissolved in sufficient quantity of warm water and thoroughly stirred to form a thin slurry which shall then be screened through a clean course cloth. 2.00 kg of gum and 0.4 kg. of copper sulphate dissolved separately in hot water shall be added for every cu.m. of the slurry which shall then be diluted with water to the consistency of milk so as to make a wash ready for use.

The treated surface shall be allowed to dry before distemper coat is given. In the case of new work, the treatment shall consist of a priming coat of whiting followed by the application of two or more coats of distemper till the surface shows an even colour. For old work the surface prepared as described above and shall be applied one or more coats of distemper will the

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surface stains an even colour. The application of each coat shall be as follows. The entire surface shall be coated with the mixture uniformly, with proper distemper brushes (ordinary white wash brushes shall not be allowed) in horizontal strokes followed immediately by vertical ones which together shall constitute one coat. The subsequent coats shall be applied only after the previous coat has dried. The finished surface shall be applied only after the previous coat has dried. The finished surface shall be even and uniform and shall show no brush marks. Enough distemper shall be mixed to finish one room, which can not be completed the same day. After each days work the brushes shall be washed in hot water and hung down to dry. Old brushes which the dirty or caked with distemper shall not be used.

### **CEMENT PRIMER COAT:**

(Alkali Resisting Primer) Cement Primer coat is used as base coat on wall finish of cement lime or lime cement plaster or on asbestos cement surface before oil bound distemper or oil based painted are applied on them. The cement primer is composed of a medium and pigment which are resistance to the alkalis present to the cement lime or lime cement in wall finish and provides a barrier for the protection of subsequent coats of oil bound distemper or paints. Painting coat shall be preferable applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surface. New plasters patches in old work, before applying oil bound distemper paints etc. should also be treated with cement primer. The surface shall be thoroughly cleared of dust, oil white colour wash by washing and scrubbing . The surface shall then be to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface dry unevenness shall be made good by applying putty, made of plaster of paris mixed with water. On the entire surface including filling up the undulation and then sand papering same after it is dry. The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving up brush marks. It shall be followed to dry for at least 48 hours before oil bound distemper paint is applied.

### **PAINTING:**

All surfaces for painting shall be properly sand papered and cleaned and where necessary good quality putty shall be used hide all holes, open joints etc. Paint shall be applied with approved brushes and surfaces shall be sand paper after every coat. All work complied shall presents smooth, clean solid and uniform surface to the satisfaction of the Engineer-in-Charge.

### **SYTHETIC ENAMEL PAINT:**

Synthetic enamel paint of approved brand and manufacture and of the required shade shall be used for top coat and as under coat of shade to match the top coat is recommended by the manufacturer shall be used. Under coat of the specified paints of shade suite to the shade of the top coat be applied and allowed to dry over night. It shall be rubbed next day with the fine grade wet abrasive paper to ensure a smooth and even surface free from brush marks and all loose particles dusted off. Top coat of specified paint of the desired shade shall applied after the under coat is thoroughly dry. Additional finishing coats shall be applied if found necessary to ensure properly uniform glossy surface.

### **ALUMINIUM PAINT:**

Aluminum paint of approved brand and manufacture shall be used. The paint comes in compact dual containers with the paste and the medium separately. The two shall be mixed together to proper consistency before use. Each coat shall be allowed to dry for 24 hours and lightly rubbed down with fine grade sand paper and dusted before the next coat is applied. The

finished surface shall present an even and uniform appearance. As aluminium paint is likely to settle in the container, care shall be taken frequently stirr the paint during use. Also the paint shall be applied and laid off quickly, as surface is otherwise not easily finished.

### **PLASTIC EMULSION PAINT:**

Plastic emulsion paints are not suitable for application on external wood and iron surface and surface which are liable to heavy condensation are to be used general masonry or plastered surfaces. No priming coat is required for the later. Plastic emulsion paint of approved brand and manufacture and of the required shade shall be used. The paint will be applied in the usual manner with brush or roller. The paint dries by evaporation of the water content and as soon as the water has evaporated the film gets hard and the next coat can be applied. The time of drying varies from one hour on absorbent surface to 2 to 3 hours on non-absorbent surfaces. The thinning of emulsion is to be done with water and not with turpentine. Thinning with water will be particularly required for the undercoat which is applied on the absorbent surface. The quantity of thinner to be added shall be as per manufacture's instructions. The surface on finishing shall present flat velvet smooth finish. If necessary more coats will be applied till the surface present a uniform appearance.

Precautions (i) old brushes if they are to be used with emulsion paints should be completely dried of turpentine or oil paints washing in warm soap water. Brushes should be quickly washed in water during break periods to prevent the paint from hardening in the brush. (ii) In the preparation of walls plastic emulsion painting on oil based puties shall be used in filling cracks, holes etc. (iii) Splashes in floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening. (iv) Washing of surfaces treated with emulsion paints shall not be done within 3 to 4 weeks of application.

### **VARNISHING:**

Varnish for the upper coat shall be a flating varnish of the same manufacture as the top coats. New wood work to be varnished shall have been finished smooth with a carpenter's plane, knots shall be cut to a slight depth. Cracks and holes shall be cleaned of dust. The knots, cracks etc. shall then be filled in with wood putty. The varnish shall be applied liberally with a full brush and spread evenly with short light strokes to avoid frothing. If the work is vertical the varnish shall be crossed and recrossed and then laid off the latter being finished on the upstrokes so that varnish, as it sets, flows down and eliminates brush marks. The above process will constitute one coat. If the surface is horizontal, varnish shall be worked in every direction with light quick strokes and finished in one definite direction, so that it will set without showing brush marks. Rubbing down and fatting the surface shall be done after each coat except the final coat with fines and papers. The work shall be allowed to dry final coat with fines and papers. The work shall be allowed to dry away from draughts and damp air. The finished surface shall then present a uniform appearance and fine glossy surface free from streaks blister etc. Any varnish left over in the small container shallow so poured back into the stock tin, as it will render the later unfit for use. Special fine haired varnishing brushes shall be used and not ordinary paint brushes. Brushes shall be well worn and perfectly clean.

### **OILING WITH LINSEED OIL:**

Raw linseed oil shall be lightly viscous, but clear and of a yellowish colour with light brown tinge. Its specific gravity at a temperature of 30°C shall be between 0.923 and 0.928 . The oil

shall be mellow and sweet to the tests with very little smell. The oil shall be of sufficiently matured quality. Oil turbid or thick, with acid and bitter tests, and rancid odour and which remains strictly for a considerable time shall be rejected. The wood work shall be cleaned of all smoke and grease by sand papering or by washing with lime and water. The surface shall then be washed with soap and water and completely dried. The oil shall be applied freely with brushes (not rags) and spread evenly and smooth until no more oil is absorbed. Each subsequent coat shall be applied after the previous coat is thoroughly dried and in any case not before 24 hours of application of first coat. Work after completion shall not be patchy and sticky to the touch and shall present a uniform appearance.

### **FLAT WALL PAINTING:**

The priming coat shall consist of "Distemping Primer" or "Cement Primer". The flat wall paint shall be approved brand and manufacture and of required shade. The surface shall be prepared as described in sub-head "Cement Primer Coat". Flat wall paint shall normally be applied on walls in 12 months after their completion (in case of new work), in which case distemper primer will be sufficient. If the walls are to be painted earlier the primer coat shall consist of cement primer. When the surface is dry, painting with wall point in uniform and even layers will be done to the required number of coats. Each coat shall be allowed to dry over night and lightly rubbed with very fine grade of sand paper and loose particles brushed off before the next coat is applied. If after the final coat of wall paints the surface obtained is not up to the mark further and more coat as require shall be given to obtain a smooth and even finish at the cost of contractor. If primer of wall paints gets thickened it shall be thinned suitably with the thinner as recommended by manufacturer.

### **DOOR /WINDOW CLAMPS OR HOLDFASTS:**

Unless otherwise specified the clamps shall be fixed to other side of the from with screws. For the purpose of receiving clamps a recess of at least 12 mm. deep of suitable size shall be cut into the Frame. After fixing the frame true to plumb with the clamps, the exposed face of the clamps shall be covered by thin wooden covering fixed with screws.

(b) The side of the door window frames which remains in contact with masonry shall invariable be painted with a protective coat of paint.

### **SCHDULE OF FITTINGS:**

Fitting shall be iron, aluminium or as specified. These shall be well made, reasonable smooth and free from sharp edges, corners, flaws and other defects. Screws holes shall be counter sunk to suitable heads of specified wood screws. All hinge pins shall be of steel and their riveted heads shall be well formed. Iron fitting shall be finished bright or black enameled or copper oxidised. Brass fittings shall be finished bright (brass), oxidized or chromium plated (electroplated) and aluminum fittings shall be finished bright or anodized or as specified. Fittings shall be got approved by the Engineer –in-Charge before fixing.

(ii) Screws used for fittings shall be of the same metal and finish as the fittings. However anodized brass screws or chromium brass screw shall be used for fixing aluminum fittings.

(iii) Fittings shall be fixed in proper position as shown in the drawings or as directed by the Engineer-in-Charge. These shall be truly vertical or horizontal as the case may be. Screw shall be driven home with screw driver and not hammered in. Recesses shall be cut to the exact size and depth for counter-sinking of hinge.

### **THIN PRECAST R.C. LINTEL IN BRICK WALLS:**

The composite action of this lintel with brick work above is governed by a number of parameters. The design of composite lintel is same what complicated and not easily mend able to calculations. For the ready use design chart for thin precast lintel in brick walls of normal residential building is given in the attached drawing sheet no. 5. It is applicable only when the load on the composite lintel is a uniformly distributed one. The brick work over lintel shall be not less than 50 mm. in height and shall be constructed in a mortar not leaner than 1:6 cement; sand mortar or 1:1:6 cement lime, sand mortar. Thin lintels shall not be used in brick walls made in mortar. It shall be noted that there is no composite action in continuous lintels at intermediates supports, where the top portion of the lintel is in tension.

The thickness of the lintel shall be thickness of the brick, i.e. 70mm. in case of traditional bricks and 90mm. in case of modular bricks and the width shall be the width of the wall. The lintel shall preferably have a bearing or 230/200 mm. on either support. Details of a thin precast lintel in a single brick thick wall over an opening of span 1200 mm. and details of a thin precast lintel with chujja are shown in the table in the drawing sheet no 5. Items of work not covered by the above specification shall be carried out according to the direction of the Engineer- in-Charges and to his satisfaction.

In cases of shuttering for building work, in foundation or super structure, are timber necessary are to be supplied by the contractor. Timbers that are supplied by the contractor should have its quality checked by the supervising staff. In case the timber used is of old and used quality the same should be got approved by the Engineer-in-Charge or his authorised representative.

Placement of H.B. Netting of approved quality should be diagonally so as to another the panel with beam and at junctions with the main wall. The rate should be inclusive of cost of H.B. netting.

Raking out of joints of brick work should be done 24 hours after the completion of brick work, so as to render the surface ready for plaster. The rate of plaster should cover the cost of raking out of joints, but full payment to brick work will not be admissible unless the ranking out of joints is done satisfactorily as per direction of the Engineer-in-charge.

### **C. MODES OF MEASUREMENTS**

#### **GENERAL:**

Unless specifically mentioned otherwise, the following modes of the measurement shall be adopted. In general the mode of measurements of all Civil Engineering Works shall be guided by **ISI code no. IS:1200-1964 (revised) for Indian Standard Method of measurement of Building works** and **PWD schedule of rates effective from 01.07.2014.**

#### **BRICK WALLS:**

**a)** The thickness of brick wall made with one brick laid on edge (with the long side parallel to the length of the wall) shall be measured as 75 mm. similarly, a wall made with one brick laid flat (with the long side parallel to the length of wall) shall be measure as 125 mm. One brick thick walls (with the length of brick parallel to the thickness of the wall) shall be measured as 250 mm. One an half brick walls (i.e. one brick along the length and one brick along the width) shall be measured as 375mm. Two brick walls measuring as 500 mm. and so on. The width of lintels etc. covering the entire thickness of brick wall shall also be measured as equal to corresponding wall thickness.

**b)** Net measurement of all walls be taken after deduction of all openings etc. This applies to 125 mm. thick and 75mm. thick wall also parapets (upto 1060mm. height) will be measured along with brick work of the floor just below the roof and will be paid for at the same rate.

**c)** No extra will be paid for curved or chamfered work even though it may necessiate cutting of bricks. For small curves of chamfers the Engineer-in-Charge may at his discretion, allow measurement on the square (i.e. without deduction for the quantity removed for forming the small curve or chamfer.)

#### **CONCRETE PLAIN OR REINFORCED:**

Finished net measurement will be taken after deduction of large holes, rebates etc. but without deduction for the volume of reinforcement, if any, in the concrete (reinforced).

#### **REINFORCEMENT:**

The measurement will be on the basis of calculated weight of reinforcement only (i.e. without considering the weight of tying wires) actually consumed in the finished work as per drawing and design or as per direction of the Engineer-in-Charge. If the length of any rod be more than that shown in the drawing but has been allowed to be used, the length will be taken on the length shown in the drawing. Hooks and clamps as per standard practice will be measured and paid for.

#### **PLASTER:**

For measurement of plaster (exterior or interior) deduction is to be made for door, window or opening of similar dimension and allowance is to be made for jambs sills and soffits. Payment will be made on the basis of surface measurement of wall deducting one-third the measurement of such openings and without any separate measurement for jambs sill and soffits. In case of large openings, however, as in the case of verandahs with columns, payment will be on actual measurement. Ceilings shall be measured between the walls or partitions and the dimensions before plastering shall be taken. The measurements of wall plastering shall be taken between the walls or partition (the dimensions before plastering shall be taken) for the length and from the top of floor or skirting to the ceiling for the height.

#### **WHITE WASHING AND COLOUR WASHING:**

Payment will be made on the basis of surface measurement without any deduction for door, window or opening of similar dimensions and without any separate measurement for jambs sills and soffits.

For cement paint, distempering and wall painting to walls or concrete jallies or similar other work, method of measurement shall be the same as in plaster.

#### **PAINTING:**

**(a)** Measurement for painting work in doors and windows, grills, gratings, collapsible gates, corrugated roofing etc. shall be made on the following basis. In all case the "Area" shall be measured flat (and not girthed). For doors and windows, no separate payment shall be made for the frames (chowkets), the "Area" in such cases represents the area of the finished wall opening covered by the frames (including exposed surface of the frames). For grills, gratings etc. the area represents the area of the opening covered by other frames).

**(b)** The "Area" measured as above shall be multiplied by the factors given in the WRDD Schedule of Rates effected from 01.11.2007 and corrigendum on it (if any) and the work of painting shall be paid on the quantities thus arrived at.

**METAL, CHIPS, BOULDERS, BATS, SAND, SURKI, LIME, COAL, CARRIED EARTH ETC:**

**(a)** Unless specifically mentioned otherwise in the description of the item itself, measurements for supply and / or carriage shall be taken in stacks and that as soon after the stacks are made as possible. The height and the shape and size of the stacks shall be as per direction of the Engineer-in-Charge but in no-case shall the height of the stacks be less than the minimum as indicated hereinafter. Allowance for sinkage and/or shrinkage shall be made as indicated hereinafter. The net quantity shall be arrived at after deducting this allowance from the measurement of fresh stacks and payment for supply / or carriage shall be made on the net quantity thus derived. "Quantity" of any materials shall always indicate such net quantity, unless specifically mentioned otherwise.

**(b)** If for any special reasons, as per provisions in any particular contract, final measurements have to be taken in wagons (before unloading) and at destination no deduction for shrinkage shall be made. For carried earth supplied by the contractor the earth is to be first stacked at site for measurement and the earth utilize in work after such stacks have been measured up. The items of earthwork with such carried earth include the cost of such operation. The net quantity, for the purpose of payment shall be derived after deducting allowance for sinkage and/or shrinkage as specified below. In special circumstances, the Engineer-in-Charge, at his sole discretion, take borrow pit it measurements for such carried earth in which case no allowance for sinkage and/or shrinkage is to be deducted. More earth is to be carried from any excavation, the measurement of carriage of excavated earth will be taken on the basis of earth excavated.

**(c)** For conversion of brick materials form one to anther 314 Nos. of bricks will be taken to produce net 1cu.m. of bats and 1.1cu.m. of bats to produce net 1cu.m. of Khoa or metal. Unless specifically mentioned other wise in any particular contract 1025 Kg. of steam coal shall be taken as equivalent to 1cu.m. (when measured in very old and settled stacks or in wagon at destination or after deducting sinkage and/or shrinkage). Similarly, 1107 Kg of slack coal shall be taken as equivalent to 1cu.m.

**(d)** For consolidation of stone or jhama metal and similar works involving utilization of materials already measured in stacks, the quantity of materials actually consumed in such works will be same as the recorded quantities after due all allowance for sinkage and /or shrinkage, where applicable, if the stack or stacks actually utilized in such works.

**(e)** Schedule showing minimum height of stacks and the allowance to be deducted for sinkage and/or shrinkage when measured in fresh stacks.

<b>Materials</b>	<b>Minimum height for of stacks</b>	<b>Allowance to be deducted sinkage and/or shrinkage</b>
Stone metal, Ballast chips Shingles or gravel.	32.5 cm.	1/13
Stone boulders & Laterite 15 cm. or above size	53 cm	5/7
Stone boulders & Laterites below 15 cm. Size.	45 cm	1/9
Jhama bats or brick bats	53cm	1/7

Jhama metal, khoa or chills	34cm	1/9
Sand	61 cm	1/8
Surki	61 cm	¼
Lime	61cm	¼
Morum	32.5 cm	1/13
Carried earth	34cm	1/9
Rubbish (building or Kiln)	34cm	1/9
Steam coal or slack coal	61cm	1/8
Cinder	34cm	1/9

**The contractor shall be paid on actual measurement of finishing work on the basis of quoted rates. The contractor shall be eligible for payment after submission of bills by him to the Department.**

**TESTING OF MATERIALS & WORKS:**

Contractor should liable to carried out the testing of all materials & works like concrete, bricks, wood, etc. by their own cost from **Government Test House at Alipore , Kolkata.** as per relevant IS Code of Practice. No Payment will be done to contractor for the Testing procedure.

**Sd/-  
Teacher-in-Charge,  
M.G.College, Lalpur**